

APPENDIX A. I-76 AND BRIDGE STREET INTERCHANGE ENVIRONMENTAL
ASSESSMENT

I-76 & Bridge Street INTERCHANGE



I-76 and Bridge Street Interchange Environmental Assessment

January 2015

Submitted by



Prepared for

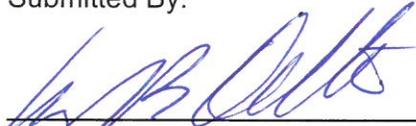


**I-76 and Bridge Street Interchange
Environmental Assessment**

Submitted Pursuant to
42 USC (2)(c), 49 USC 303
By the
U.S. Department of Transportation
Federal Highway Administration
and the
Colorado Department of Transportation

Project Proponent
City of Brighton

Submitted By:

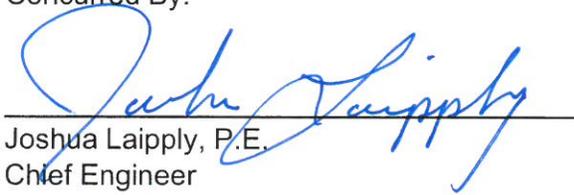


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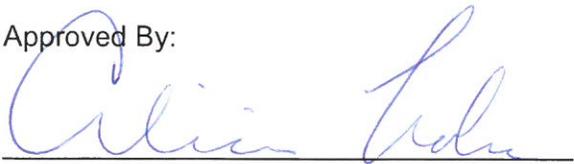


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Availability of the I-76 and Bridge Street Environmental Assessment

Copies of the Environmental Assessment are available in hard copy format for public review at the locations listed below and/or by request from CDOT Region 1. Note that there is a charge for CDOT to print the document. The document is also available electronically on CDOT's website: www.coloradodot.info/library/studies/i76bridgestreetea and on Brighton's website: www.brightonco.gov/605/I-76-and-Bridge-Street-Interchange-Proje

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The website form can be completed on Brighton's website:

www.brightonco.gov/605/I-76-and-Bridge-Street-Interchange-Proje

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Appendix B: Air Quality Technical Report

Appendix C: Traffic Noise Technical Report

Appendix D: Biological Resources Technical Report

Appendix E: Wetland Finding Technical Report

Appendix F: Modified Phase I Environmental Site Assessment Technical Report

Appendix G: Agency Consultation Documentation

Appendix H: Outreach and Support Documentation

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Acronyms and Abbreviations

A	
AA	Assessment Area
AASHTO	American Association of State Highway and Transportation Officials
ACM	Asbestos-Containing Materials
ADT	Average Daily Traffic
AM	Ante Meridian/Morning
AOI	Area of Interest
APCD	Air Pollution Control Division
APE	Area of Potential Effect
B	
Brighton	City of Brighton
BMP	Best Management Practice
BO	Biological Opinion
C	
CAA	Clean Air Act
CDOT	Colorado Department of Transportation
CDOA	Colorado Department of Agriculture
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CO	Carbon Monoxide
CPW	Colorado Parks and Wildlife
CRS	Colorado Revised Statutes
CSP	Central Shortgrass Prairie
CWA	Clean Water Act
D	
DRCOG	Denver Regional Council of Governments
dBA	A-Weighted Decibel
E	
EA	Environmental Assessment
EC	Executive Committee
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
ES	Executive Summary
ESA	Endangered Species Act

F	
FACWet	Functional Assessment of Colorado Wetlands
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
G	
GIS	Geographic Information Systems
GHG	Greenhouse Gas
GPS	Global Positioning System
H	
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HUD	U.S. Department of Housing and Urban Development
I	
I-25	Interstate 25
I-70	Interstate 70
I-76	Interstate 76
I-80	Interstate 80
IAR	Interchange Access Request
L	
Leq	Equivalent Sound Level
Leq(h)	Hourly Equivalent Sound Level
LOS	Level of Service
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
M	
MBTA	Migratory Bird Treaty Act
MESA	Modified Environmental Site Assessment
MOA	Memorandum of Agreement
MP	Milepost
MPH	Miles per Hour
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System
MSAT	Mobile Source Air Toxic
MVRTP	Metro Vision Regional Transportation Plan
N	
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NWP 14	Section 404 Nationwide Permit 14: Linear Transportation Crossings
O	
O ₃	Ozone
OHWM	Ordinary High Water Mark
P	
Pb	Lead
PBA	Programmatic Biological Assessment
PEM	Palustrine Emergent
PM	Post Meridian/Afternoon
PM _{2.5}	Particulate Matter 2.5 Micrometers in Diameter and Smaller
PM ₁₀	Particulate Matter 10 Micrometers in Diameter and Smaller
PUD	Planned Unit Development
R	
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RTD	Regional Transportation District
RTP	Regional Transportation Plan
S	
SH 7	State Highway 7
SH 52	State Highway 52
SIP	State Implementation Plan
SLS	System-Level Study
SO ₂	Sulfur Dioxide
SPWRAP	South Platte Water Related Activities Program
STIP	State Transportation Improvement Program
SWMP	Stormwater Management Plan
T	
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TMC	Turning Movement Counts
TNM	Traffic Noise Model
TSM	Transportation System Management
U	
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act
US 36	U.S. Highway 36
US 85	U.S. Highway 85
US 287	U.S. Highway 287
USACE	U.S. Army Corps of Engineers
USC	United States Code
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank

V	
VMT	Vehicle Miles of Travel
VOC	Volatile Organic Compound
W	
WQCA	Water Quality Control Act
WQCC	Water Quality Control Commission
WUS	Waters of the U.S.

Executive Summary

Preparation of the I-76 and Bridge Street Interchange Project Environmental Assessment has been a cooperative effort among the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT) as joint lead agencies and the City of Brighton (Brighton) as the project proponent. The intent of this Environmental Assessment (EA) is to determine transportation problems, identify alternatives to solve these problems, and analyze impacts of the alternatives to determine what the best solution is. The National Environmental Policy Act of 1969 (NEPA) requires federally funded projects that may have an impact on the environment to be analyzed through a rigorous process that allows the public to understand and comment on the benefits and impacts of the project.

This executive summary of the EA provides an overview of the project, including the project Purpose and Need, a description of the alternatives studied, and the potential impacts and mitigation. For details on the information provided in this executive summary, refer to the corresponding chapters.

ES.1 Project Description

The City of Brighton proposes to construct an interchange at Interstate 76 (I-76) and Bridge Street on the eastern side of Brighton in Adams County. The proposed interchange provides an opportunity to increase regional east-west connectivity across State Highway 7 (SH 7), which will become increasingly important with future population growth and increased travel demand. The adjacent interchanges on I-76 are at Bromley Lane to the south and at Baseline Road to the north. Exhibit ES-1 illustrates the location of the project in the regional context.

Exhibit ES-1. Location of the Project in the Regional Context**ES.2 Project Purpose and Need**

The purpose of the project is to increase local and regional east-west connectivity, reduce the amount of travel delay through the planning horizon year of 2035, and improve traffic flow in the project area.

The need for the project results from the following issues:

- Lack of local and regional connectivity
- Current and future congestion
- Poor current and future traffic flow and delay on the surrounding roadway network

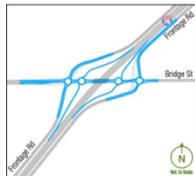
ES.3 Screening Process and Description of Alternatives

The project Purpose and Need was used to develop evaluation criteria to compare alternatives. Brighton, CDOT, and FHWA collaboratively established evaluation criteria for the following measures:

- The project Purpose and Need
- Infrastructure impacts, safety, drivers' expectations, truck traffic accommodation, and traffic operations
- Impacts to the natural and built environment

Following the evaluation process, out of the 12 initial alternatives, three Action Alternatives—along with the No-Action Alternative—were advanced for detailed analysis. Exhibit ES-2 lists the alternatives that are fully evaluated in this document and provides a brief description of each one. The Two-Roundabout Interchange Alternative is identified as the Preferred Alternative. More detail on the alternatives evaluation and screening process is available in Chapter 3, Alternatives Analysis.

Exhibit ES-2. Alternatives Evaluated

Alternative	Description
 <p>No-Action</p>	Includes existing, planned, and programmed roadway operations and maintenance improvements in the project area
 <p>Preferred Alternative: Two-Roundabout Interchange</p>	Combines the interstate frontage roads and ramp terminals to make a six-legged roundabout on each side of I-76
 <p>Alternative 2: Four-Roundabout Interchange</p>	Combines the interstate frontage roads into a roundabout and the ramp terminals into another roundabout, for two four-legged roundabouts on either side of I-76
 <p>Alternative 3: Three-Roundabout Interchange</p>	Combines the interstate frontage roads and ramp terminals into a six-legged roundabout on the west side; combines the ramp terminals into one four-legged roundabout and the interstate frontage roads into another four-legged roundabout on the east side

ES.4 Proposed Preferred Alternative

Although all of the Action Alternatives have similar impacts, per Brighton's preference, the Two-Roundabout Interchange Alternative was identified as the Preferred Alternative. This alternative was identified because:

- It includes only two roundabouts, instead of the three or four roundabouts included in Alternatives 2 and 3. This will simplify signage and markings and drivers' choices by consolidating ramp and frontage road access points into a single roundabout on each side of the highway.
- It is a simpler design with easy construction phasing that will create fewer anticipated traffic impacts during construction compared to Alternatives 2 and 3.
- It accommodates heavy truck turning movements more efficiently than Alternatives 2 and 3.

There are other minor differences between the Preferred Alternative and other Action Alternatives; however, they were not a deciding factor in identification of the Preferred Alternative. These minor differences include:

- The Preferred Alternative has no impact on the adjacent Speer Canal in the northwest quadrant of the interchange; therefore, it avoids the need to construct a retaining wall adjacent to Speer Canal, while Alternative 2 requires construction of this retaining wall.
- The Preferred Alternative will have permanent right-of-way impacts of 0.24 acre, and no full property acquisitions or relocations will be required. Alternative 2 requires 0.463 acre and Alternative 3 requires 0.108 acre of permanent right-of-way impacts.
- The Preferred Alternative will not conflict with the access point to the property in the southeast quadrant of the interchange, while Alternatives 2 and 3 require modifications to this property's access point.

ES.5 Impacts and Mitigations

Impacts to the built and natural environment in the project area have been analyzed for the No-Action Alternative and the three Action Alternatives. This project has minimal impacts to some of the resources and would not impact other resources. Based on data collection and the project team's expertise, some resources are not impacted by any of the alternatives, so they are not included in the detailed impacts and mitigations discussion in this document. These resources are:

- Energy
- Farmlands

- Floodplains
- Parks and Recreation
- Section 4(f) Properties
- Section 6(f) Resources
- Soils and Geology
- Visual Resources
- Environmental Justice (not present in the area)

Mitigation measures or best management practices (BMPs) are proposed to alleviate impacts from the Action Alternatives. Exhibit ES-3 outlines the evaluated resources and the anticipated impacts to these resources with each alternative.

Exhibit ES-3. Potential Impacts to Resources

Resource	Potential Impacts	
	No-Action Alternative	Action Alternatives
Transportation	Many intersections at Bromley Lane and Baseline Road will operate at Level of Service (LOS)* F by 2035	Expected to decrease congestion at Bromley Lane and Baseline Road and improve operations to LOS C or better; expected to decrease congestion and improve LOS at other local intersections by 2035; traffic on I-76 will not be impacted greatly by this project
Air quality	No impacts	Conforms with the 2035 Metro Vision Regional Transportation Plan (MVRTP); expected to have negligible impact on air quality by 2035
Traffic noise	No impacts	No permanent long-term noise impacts exceeding the standards are anticipated; however, temporary construction noise impacts are anticipated
Land use and zoning	Incompatible with future land use plans; does not support goals and objectives of local land use plans or address travel demand	Action Alternatives are compatible with existing and future land use plans in the project area and support the goals and objectives of adopted local land use plans
Right of way	No impacts	Approximately 0.108 acre to 0.463 acre of permanent right-of-way acquisition and 0.118 acre to 0.127 acre of temporary construction right-of-way impacts are anticipated
Socioeconomics	No impacts	There will be minimal temporary construction impacts, including detours
Utilities	No impacts	Possible adjustments and/or relocations for three to 16 utility lines are anticipated

Resource	Potential Impacts	
	No-Action Alternative	Action Alternatives
Biological resources	No impacts	There will be minimal impacts to natural vegetation and habitat; the possibility exists of spreading noxious weeds from within the project area to other areas not currently invaded
Wetlands	No impacts	All Action Alternatives will permanently impact 0.01 acre (585 square feet) of wetlands; there are no permanent or temporary impacts to open waters
Water resources and water quality	No impacts	Action Alternatives will increase the potential for erosion and movement of sediment due to ground disturbance; temporary impacts to a CDOT Municipal Separate Storm Sewer System (MS4) permitted area and existing stormwater drainage infrastructure are anticipated
Hazardous materials	No impacts	There are no identified known locations with hazardous materials contamination; it is possible to encounter unknown hazardous materials due to ground disturbance activities during construction
Historic properties	No impacts	There could be possible indirect impacts to previously uncovered archeological resources

**Congestion is measured in terms of LOS. The LOS is described by a letter designation from "A" to "F," with LOS A representing essentially uninterrupted flow with minimal delays and LOS F representing a breakdown of traffic flow with excessive congestion.*

ES.6 Next Steps

When this EA document is published, a 30-day public review and comment period will be conducted, including a public open house or an informational booth at a public function. The public review period will allow the public to offer input on the proposed Preferred Alternative.

When the public review period concludes, feedback received will be reviewed and incorporated into the decision document. The decision document will be either: (1) a Finding of No Significant Impact (FONSI), or (2) a Notice of Intent to prepare an Environmental Impact Statement (EIS).

During final design and through construction, the project team members will continue to coordinate and interact with stakeholders and community members.

Chapter 1: Introduction

This chapter provides a general introduction to the I-76 and Bridge Street Interchange Project, including the project area, project background, the agencies involved in the project, and an overview of the NEPA process.

1.1 Project Location and Background

The proposed I-76 and Bridge Street Interchange Project is located in Brighton, Colorado, in Adams County. Brighton is approximately 20 miles northeast of Denver and is within the Denver Regional Council of Governments (DRCOG) Transportation Management Area (TMA). Exhibit 1-1 shows the location of the project within the regional context.

Exhibit 1-1. Location of the Project in the Regional Context



According to DRCOG's 2035 MVRTP, Bridge Street is a regionally significant roadway in the area that provides east-west connectivity through Brighton and is a critical roadway link between the cities of Brighton, Broomfield, Lafayette, and Boulder. However, the roadway does not have access to I-76. Except for Bridge Street, few alternate routes exist that provide connectivity to other area highways, such as U.S. Highway 36 (US 36), Interstate 25 (I-25), and U.S. Highway 85 (US 85).

Growth in high-density residential land use areas in Brighton will impact the transportation network. Most travelers use I-76 to reach employment centers south of Brighton throughout the greater Denver Metro area. Currently, there are only two interchanges that connect the high-density residential areas to I-76. These interchanges are located at I-76 and Bromley Lane and at I-76 and Baseline Road. This limited connectivity affects the mobility of regional and local trips and emergency vehicles. Trips with origins or destinations along Bridge Street are forced to use the Bromley Lane and Baseline Road interchanges, taking additional surface streets in the project area to reach them. This increases travel times (longer trip lengths due to out-of-direction travel) and traffic volumes at those interchanges and on the surface streets between the interchanges. A well-connected roadway network is essential to support the social, economic, and physical development of Brighton and the region.

Brighton proposes to construct an interchange at I-76 and Bridge Street at the location of the existing Bridge Street overpass in eastern Brighton. The existing Bridge Street overpass is approximately 1.25 miles north of the existing I-76 and Bromley Lane interchange and approximately 1.5 miles south of the existing I-76 and Baseline Road interchange.

A project area was preliminary identified to initiate the study. It is bounded approximately by Baseline Road on the north, Bromley Lane on the south, 50th Avenue and Tower Road on the west, and Picadilly Road and Harvest Road on the east. Exhibit 1-2 illustrates the project area location. The project area has been defined as an urban service area by the Brighton 2020 Comprehensive Plan and it also is considered an urban growth area by DRCOG. An urban service area is where most future development will occur over the next 20 years as defined in the comprehensive plan. An urban growth area is a place where urban growth and development is encouraged and supported, both locally and regionally.

Exhibit 1-2. I-76 and Bridge Street Interchange Project Area



Historically, from the early 1900s to the early 2000s, land within the project area primarily was used for agriculture. Since 2000, Brighton’s population has grown by 60 percent. Brighton is transforming from a rural, agricultural town to a suburban community, which has changed the character of the area considerably. Suburban development is expected to continue in future years, as shown in Exhibit 1-3.

Exhibit 1-3. Anticipated Growth within the Project Area

Activity Unit	2010	2035
Households	1,496	5,177
Employment	586	764

Source: DRCOG Compass 4.0 version 3 regional travel demand model.

According to the Brighton 2020 Comprehensive Plan, future land use includes industrial, employment, mixed-use, high-density residential, and agricultural development. The project area is expected to have 346 percent household growth and 130 percent employment growth by 2035. A new high-density neighborhood is planned for the northwest corner of Bridge Street and I-76. This development is projected to introduce an additional 12,700 vehicles per day to the transportation network by 2035. Residential growth will outpace employment growth in the area.

The transportation system is integral to growth and development in the Denver Metro Region. DRCOG's 2035 MVRTP identifies a vision for a safe, accessible, and efficient transportation system that integrates with land use and maximizes regional benefits.

Brighton, which is located within DRCOG's Urban Growth Boundary, continues to transform from a rural, agricultural town into a suburban community. Development is expected to continue, making a well-connected roadway network essential to support the social, economic, and physical development of Brighton and the region.

Brighton is studying current and future travel patterns in the eastern portion of the community, where recently completed and imminent development is expected to impact important local and regional roadways, as well as I-76. Future improvements are needed within the project area to increase mobility and maintain system quality and safety.

Brighton has identified the need for improved connectivity with I-76 at Bridge Street and has proposed constructing an interchange at this location as a way to address this need. The System-Level Feasibility Study was approved by CDOT in October 2013. This led to the initiation of this EA.

Without the I-76 and Bridge Street interchange, travelers will continue to use the frontage roads and 50th Avenue to access the two existing interchanges at I-76 and Bromley Lane and I-76 and Baseline Road, resulting in increased delays, longer travel times, and poor operations. Growth in truck-oriented businesses is expected to occur to the east of I-76 and will place additional demands on the transportation system.

Deficiencies in the current and future transportation system in the project area include:

- Lack of sufficient local and regional east-west connectivity
- Increased amount of traffic congestion through the planning horizon year of 2035 at intersections in the project area
- Poor traffic flow and delay on the roadway network surrounding I-76 and Bridge Street

The proposed interchange is consistent with existing plans, including the 2012 Adams County Transportation Plan, the 2035 DRCOG MVRTP, and Brighton's 2014–2018 Capital Improvement Funding Plan.

1.2 Agencies Involved in the Project

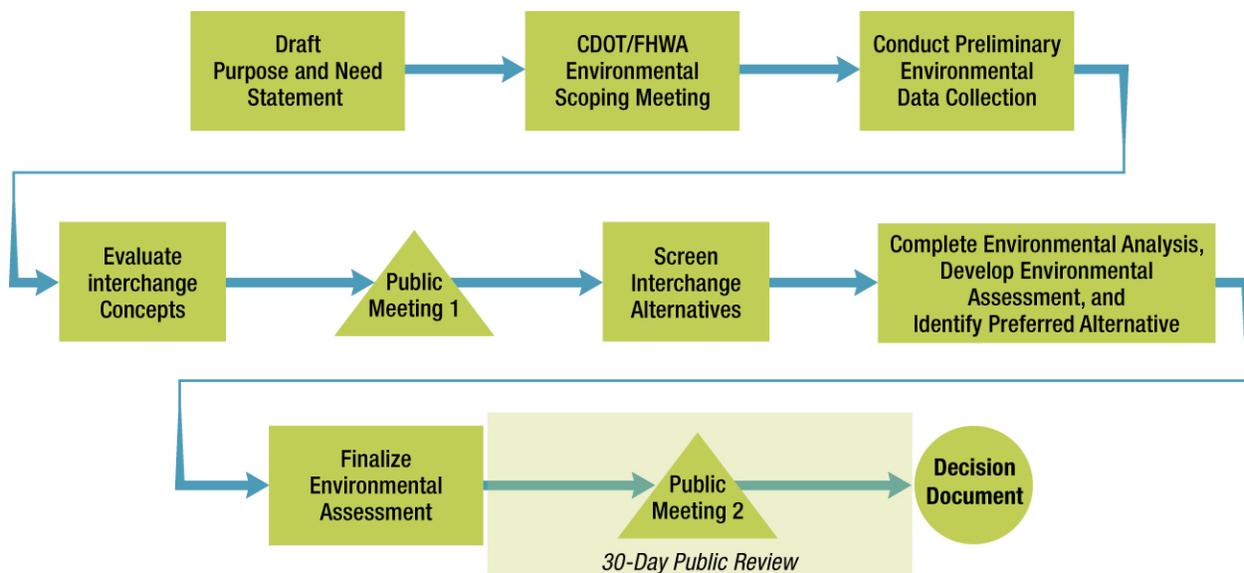
Key agencies partnered to identify and address transportation challenges and develop implementable solutions that meet the project Purpose and Need while aligning with the public and stakeholder expectations. Agencies and their associated roles and responsibilities are as follows:

- **Brighton.** Project Proponent; responsible for the overall project, including funding, construction, and maintenance
- **CDOT.** Joint Lead Agency; responsible for guiding the EA document development and engineering design elements
- **FHWA.** Joint Lead Agency; responsible for oversight of the NEPA process and approval authorization

1.3 NEPA Process

NEPA requires analysis of projects with a federal nexus (e.g., federal funding or approval) that may impact the environment. This is done through a rigorous process that allows the public and agencies to understand and comment on the benefits and impacts of the project. An EA is prepared when the significance of impacts of a transportation project is uncertain. This process allows decision makers to consider effects on the environment with other important considerations, such as need, feasibility, and cost. Part of this process includes stakeholder and public engagement. Exhibit 1-4 shows the EA process for this project. When the analysis is done, an EA is concluded with either: (1) a FONSI, or (2) a Notice of Intent to prepare an EIS.

Exhibit 1-4. I-76 and Bridge Street Interchange Project EA Process



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Chapter 2: Purpose and Need

This Purpose and Need chapter of the EA identifies and documents the current conditions using the analysis year of 2013 and the future conditions projected out to 2035 in the project area. Preparation of this EA has been a cooperative effort by the FHWA and CDOT as joint lead agencies, and Brighton is the project proponent.

2.1 Horizon Year of Analysis

Transportation modeling is used to create information to help make decisions about the future development of transportation systems. It is used as part of an overall transportation planning process that forecasts travel patterns for 15 years to 25 years into the future. The horizon year for this project is 2035, which is the year currently used for the Denver region's transportation planning process, guided by DRCOG. The year of 2035 also is used by CDOT as the horizon year in its current transportation plans for the state. Data for the year 2035 are based on available projections from DRCOG. They provide the foundation for developing and evaluating alternatives.

2.2 Purpose of the Project

The purpose of the project is to increase local and regional east-west connectivity, reduce the amount of travel delay through the planning horizon year of 2035, and improve traffic flow in the project area.

2.3 Need for the Project

The need for the project results from the following issues, which are discussed in more detail in the subsequent subsections:

- Lack of local and regional connectivity
- Current and future congestion
- Poor current and future traffic flow and delay on the surrounding roadway network

2.3.1 Lack of Local and Regional Connectivity

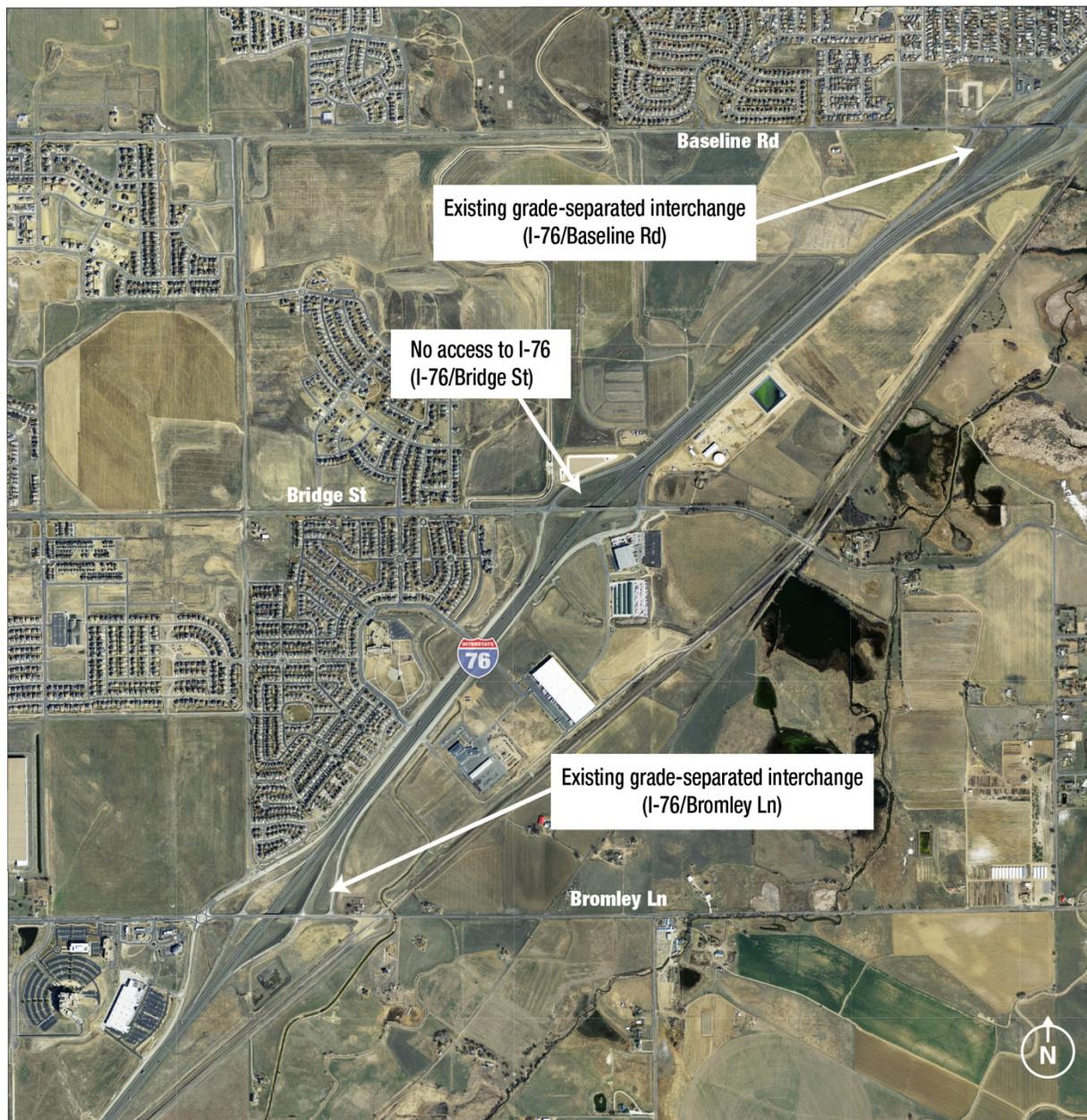
Bridge Street is an east-west principal arterial roadway in Brighton that traverses through the heart of the city. Bridge Street has been designated by Brighton as its major east-west corridor since it can accommodate high travel speeds, as well as provide wide shoulders, limited access, and vehicle capacity that meet the design standards of a state highway. Bridge Street also serves as a regionally significant roadway that provides interchange connections at I-25 and US 85, as well as direct access via signalized intersections at SH 287 and US 36. Exhibit 2-1 shows the regional connectivity along Bridge Street.

Exhibit 2-1. Regional Connectivity

Bridge Street is designated as SH 7 to the west of US 85. SH 7/Bridge Street spans approximately 30 miles between Brighton/I-76 and Boulder/US 36. The lack of an interchange at Bridge Street and I-76 diminishes regional and local connectivity. SH 7/Bridge Street is the only roadway that passes through Brighton and provides connectivity as far west as Boulder, where it connects to US 36 in Boulder. In Brighton, traffic must travel either south to Bromley Lane or north to Baseline Road to access I-76.

During conversations with project team members, local emergency responders expressed concerns with the lack of connectivity at I-76 and Bridge Street. They noted that the distance between the Bromley Lane and Baseline Road interchanges forces them to travel out of the way to access the interstate, resulting in increased response times to incidents.

Bromley Lane and Baseline Road are the only existing roadways with interchanges at I-76 in Brighton, but they provide limited east-west connectivity for regional travel between Brighton and destinations to/from the west (where employment centers and other facilities are located). Neither of these two roadways meets state highway standards or provides grade-separated interchanges at US 85 or I-25. Bromley Lane is classified as a multi-lane principal arterial west of I-76 and a two-lane collector east of I-76. Baseline Road is classified as a two-lane minor arterial west of I-76 and a two-lane collector east of I-76. Exhibit 2-2 shows the connectivity of the local roadway network in Brighton at I-76.

Exhibit 2-2. Connectivity between the Local Network and I-76

As shown in Exhibit 2-3, a significant investment has been made in the interchange at Bridge Street and US 85. The interchange is grade separated with two large roundabouts. The interchanges at Bromley Lane and US 85 and at Baseline Road and US 85 are signalized, congested, at-grade intersections. SH 7/Bridge Street has a design standard that exceeds the local city streets, allowing it to carry higher traffic volumes due to wider lane widths, wider shoulders, and fewer access points. These factors contribute to higher speeds, less congestion, and the ability to carry more vehicles.

Exhibit 2-3. Connectivity between the Local Network and US 85



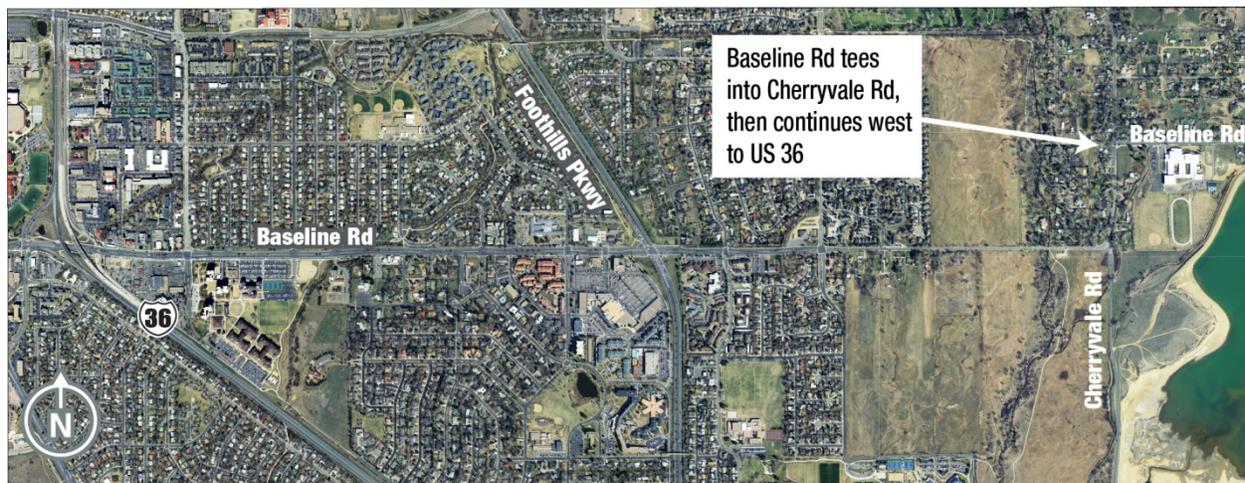
As shown in Exhibit 2-4, Bridge Street turns northwest and then continues west after it intersects with Baseline Road, which tees into SH 7/Bridge Street. At the junction, Baseline Road is stop controlled and Bridge Street is continuous. At this location and to the west, SH 7/Bridge Street changes names again and becomes SH 7/Baseline Road. While it is not uncommon for highways to have multiple names and overlapping routes, SH 7 is still the primary route.

Exhibit 2-4. Connectivity between the Local Network and I-25



There is a grade-separated interchange at I-25, to the west of which SH 7/Baseline Road connects to US 287 via a signalized intersection. At this point, SH 7 and Baseline Road diverge, with SH 7 aligned north/south coincidental with US 287 and Baseline Road continuing on an east/west alignment. To the west of US 287, SH 7 joins Arapahoe Road and continues on an east-west alignment into Boulder providing access to US 36 via a signalized intersection. Baseline Road continues on an east-west alignment to the west of US 287 and provides access to US 36 via a grade-separated interchange.

As shown in Exhibit 2-5, SH 7/Baseline Road tees into Cherryvale Road as it continues west. Then, drivers have two options: they can continue north and then west to SH 7 or south and then west onto Baseline Road. Both of these routes connect to US 36 in Boulder.

Exhibit 2-5. Connectivity between the Local Network and US 36

2.3.2 Existing and Future Congestion

As noted previously, the Brighton area currently has two interchanges at I-76: Bromley Lane and Baseline Road. The results of the existing traffic operational analysis indicate that the Bromley Lane interchange is the primary entry/exit point for residents of Brighton using I-76. The existing I-76 interchanges at Bromley Lane and Baseline Road, as well as the Bridge Street overpass over I-76, have been modeled to estimate current year (2013) and planning horizon year (2035) congestion. The traffic in the model for the year 2035 is based on the amount of growth anticipated in the area; these forecasts have been approved by DRCOG and are consistent with their projections for the project area (Brighton, 2013).

The existing and future congestion is measured in terms of LOS. The LOS is described by a letter designation from “A” to “F,” with LOS A representing essentially uninterrupted flow with minimal delays and LOS F representing a breakdown of traffic flow with excessive congestion. Generally, LOS A through LOS D are considered acceptable levels of service.

Under existing traffic conditions, the interchanges at Bromley Lane and Baseline Road are beginning to show signs of congestion. The Bromley Lane interchange serves as the main access from I-76 to Brighton. The following locations on Bromley Lane currently operate at LOS E/F:

- The Bromley Lane and West Frontage Road intersection is a single-lane roundabout. The highest volumes of peak-period traffic are the southbound left turns and eastbound/westbound through-movements. These volumes result in increased congestion for eastbound vehicles attempting to enter the roundabout during the PM (evening) peak period, and the southbound approach during the AM (morning) peak period. These movements experience LOS E.

- The eastbound ramp junction with Bromley Lane is an all-way, stop-controlled intersection that operates at an overall LOS F during the evening peak. Vehicles exiting I-76 and turning left onto Bromley Lane experience congestion.

On Baseline Road, the high volume of side-street traffic combined with single-lane approaches results in congestion and LOS E at the following locations:

- The southbound approach of the West Frontage Road during the morning and evening peak hour
- The northbound approach of the I-76 eastbound off-ramp intersection during the evening peak hour

Exhibit 2-6 and Exhibit 2-7 show the existing peak period LOS for the AM and PM peak hours.

Exhibit 2-6. Existing 2013 LOS AM Peak Period

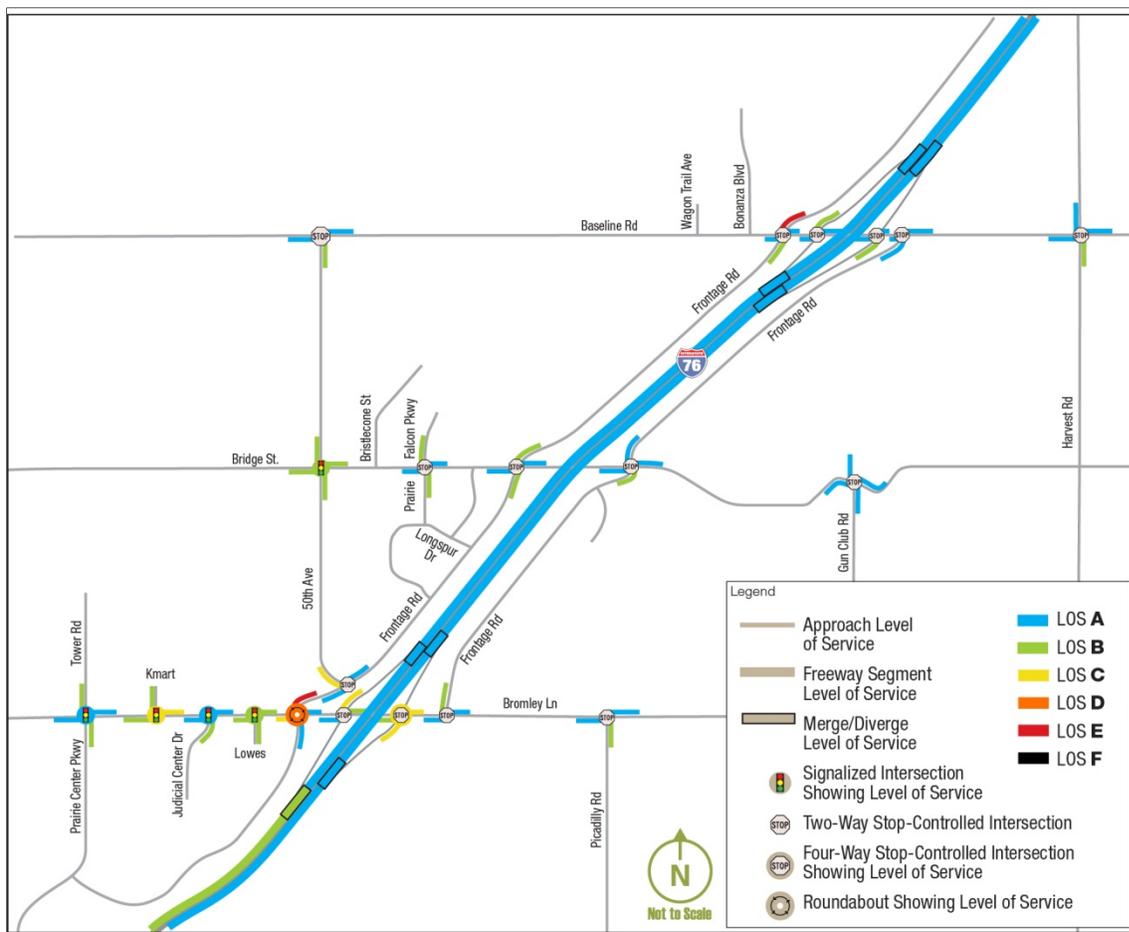


Exhibit 2-7. Existing 2013 LOS PM Peak Period

Eastern Brighton is growing rapidly, increasing demands on the existing infrastructure. Travel patterns on I-76 suggest the corridor provides important regional access for Brighton residents to employment centers in metropolitan Denver. However, current limited access to the interstate is not supportive of the development and population density in the area.

Future planned land uses for the area include additional industrial, employment, mixed-use, high-density residential use, and agricultural development. The area expects to have substantial residential population growth and development by 2035. Residential growth will outpace employment growth in the area, as discussed in Chapter 1 of this document. Growth in high-density residential areas will particularly impact the transportation network, since travelers are expected to use I-76 to reach employment centers south of Brighton throughout the greater Denver metro area. This includes a new high-density neighborhood currently being developed on the northwest corner of the Bridge Street overpass over I-76. This development is projected to introduce an additional 12,700 vehicles per day to the transportation network by 2035.

As traffic volumes increase in the future, further degradation of traffic operations is expected to occur in the project area. Travel patterns to, and volumes on, I-76 indicate that the interstate provides important regional access for Brighton residents to employment centers in metropolitan Denver. However, current interstate access is limited to interchanges at Baseline Road and Bromley Lane, which is not supportive of the development and population density in the area.

Increased daily and peak-hour volumes will impact operations along both Baseline Road and Bromley Lane, as well as operations of traffic using the mainline lanes of I-76, because of queuing on the ramps and an increase in merging and diverging maneuvers. The busiest peak time for both the Bromley Lane and I-76 interchange and the Baseline Road and I-76 interchange is the PM peak hour.

At Bromley Lane, the existing traffic volume is 6,900 vehicles per day, which will more than double by 2035 to approximately 16,100 vehicles per day. The PM peak-period traffic volumes are projected to increase considerably, from 1,000 in 2013 to 2,445 in 2035—more than doubling the current traffic volume. These volumes will exceed the facility's capacity, resulting in additional operational impacts at both the east and west roundabouts on Bromley Lane.

Exhibit 2-8 and Exhibit 2-9 illustrate projected 2035 peak period LOS for AM and PM. The projected increase in traffic volumes served at Bromley Lane intersections used to access I-76 will degrade operations to LOS E/F at several intersections:

- The southbound approach of 50th Avenue at West Frontage Road will operate at LOS F/F. The southbound approach on West Frontage Road at Bromley Lane will operate at LOS F/F in the peak periods. The westbound approach of Bromley Lane at the I-76 off-ramp will operate at LOS E in the AM peak period.
- The roundabout at Bromley Lane and West Frontage Road will degrade in operations to LOS F in both the AM and PM peak periods.
- Two of the three approaches at the intersection at Bromley Lane and the eastbound I-76 ramps will operate at LOS F in the AM peak period and all three approaches will operate at LOS F in the PM peak period.

At Baseline Road, unacceptable levels of service are anticipated at the following locations:

- The northbound and southbound approaches of the West Frontage Road at Baseline Road will operate at LOS E/F in the AM and PM peak periods, respectively. The volumes on Baseline Road reduce the number of available gaps for the vehicles attempting to turn left onto Baseline Road.
- The northbound approach of the I-76 eastbound ramp intersection at Baseline Road will operate at LOS F in the PM peak period.

All intersections and approaches along Bridge Street will operate at LOS D or better during AM and PM peak hours in 2035, with the following exceptions:

- The northbound approach of 50th Avenue will operate at LOS F during the PM peak period.
- The overall intersection operations at 50th Avenue during the PM peak period will degrade from LOS B in 2013 to LOS E in 2035.

Exhibit 2-8. Projected 2035 LOS AM Peak Period

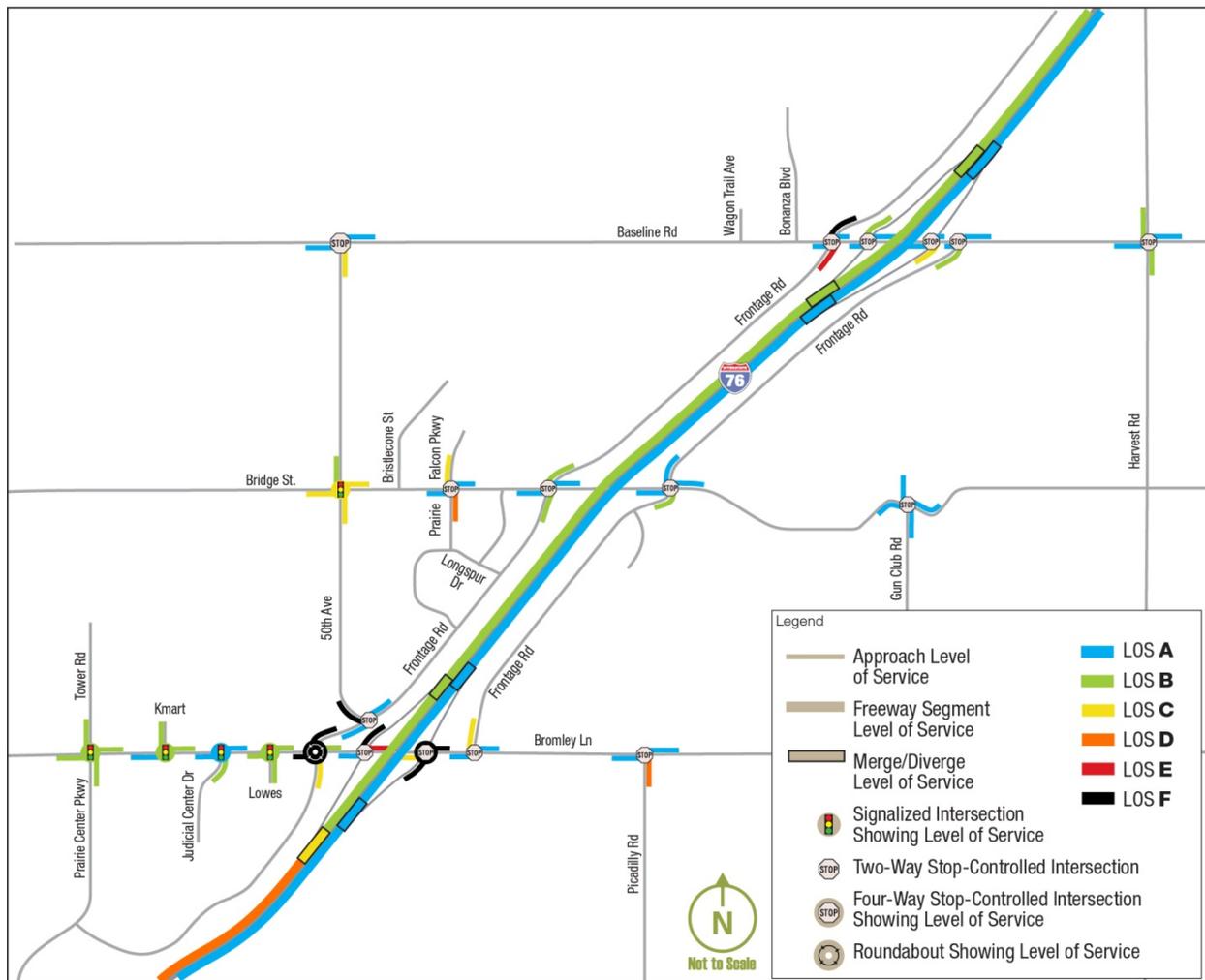


Exhibit 2-9. Projected 2035 LOS PM Peak Period



2.3.3 Poor Current and Future Traffic Flow and Delay

A key measure of operational efficiency and traffic flow in the project area is the amount of delay experienced by vehicles from Bridge Street to I-76 and vice versa. The traffic flow and delay is measured by queue backups/spill over into through-lanes and travel time/delays. Travel time is a measurement of the amount of time it can take during the peak hours to travel to a destination. For the purposes of this project, the delay is measured where traffic must traverse the project area and be able to access both the existing Bromley Lane interchange and the proposed Bridge Street interchange. The queue backups are related to the amount of traffic that either backs up onto the interstate from the ramp intersections or the amount of traffic at intersections that cannot find adequate gaps in traffic for turns so it backs up excessively on the arterial roads. Excessive backups are measured in terms of queues that spill into the through-lanes. When the queues spill into the through-lanes, this causes an unsafe condition for all traffic.

Travel time is a measurement of the amount of time it can take during the peak hours to travel to a destination. Delay occurs when the travel time is extended beyond the duration experienced in congestion-free travel. For the purposes of this project, travel time is measured from the intersection of Bridge Street and 50th Avenue to/from either the existing Bromley Lane interchange or the proposed new Bridge Street interchange to access I-76.

In Exhibit 2-10, Route 1 shows a potential route that vehicles take to access I-76 from Bridge Street and Route 2 shows a potential route to access Bridge Street from I-76 through the Bromley Lane Interchange. Routes 1 and 2 in the exhibit were selected because they represent a delay within the project area, which is a point farthest from the interchange for travelers headed to the metro area for their trips within the traffic study area.

Exhibit 2-10. Existing Bridge Street and 50th Avenue Delay to I-76

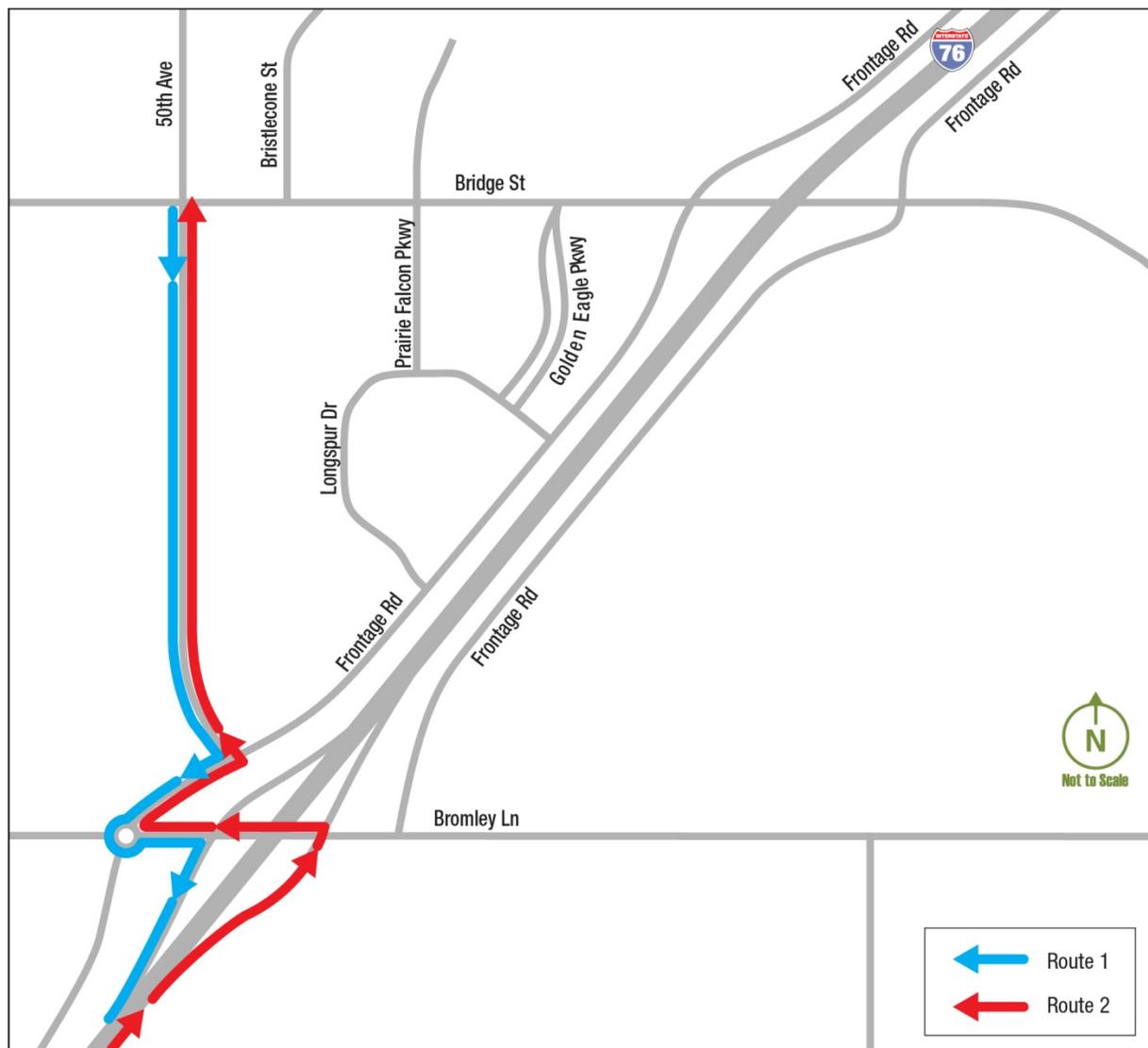


Exhibit 2-11 presents existing (2013) and 2035 No-Action delays calculated for the vehicles that use these routes.

The maximum increase in travel time along Route 1 (Bridge Street to I-76 westbound) in the PM peak in 2013 to 2035 is an increase in trip time of 3 minutes, 7 seconds per vehicle. The maximum increase in travel time for Route 2 (I-76 eastbound to Bridge Street) from the point selected in the PM from 2013 to 2035 is an increase in trip time of 3 minutes, 36 seconds per vehicle.

Exhibit 2-11. Bromley Lane Interchange Delay

Condition	Travel Time (in minutes and seconds per vehicle)			
	Route 1		Route 2	
	AM	PM	AM	PM
2013 Existing	3 minutes, 44 seconds	3 minutes, 10 seconds	3 minutes, 34 seconds	3 minutes, 27 seconds
2035 No-Action	6 minutes, 16 seconds	6 minutes, 17 seconds	6 minutes, 52 seconds	7 minutes, 3 seconds
Increase from 2013	2 minutes, 32 seconds	3 minutes, 7 seconds	3 minutes, 18 seconds	3 minutes, 36 seconds

Another measure to evaluate traffic flow and operation is a comparison between the queue lengths in the existing conditions and the projected queue lengths for the horizon year. Queue lengths are correlated to LOS at intersections, so intersections with LOS E and LOS F have longer queues.

The westbound I-76 off ramp at Bromley Lane in the AM and PM peak hours currently does not spill onto the interstate. In 2035, it is expected that the queue in both the AM and PM peak hours will spill onto the interstate and exceed the length of the off ramp.

The eastbound I-76 off ramp at Bromley Lane currently in the AM peak does not spill onto the interstate; however, the PM peak will back up onto the off ramp. In 2035, it is expected that the queue in the AM and PM peak hours will spill onto the interstate and exceed the length of the off ramp.

The roundabout at Bromley Lane is starting to fail and the backups are having an effect on the 50th Avenue/Frontage Road intersection as the queues build. In 2035, the roundabout will fail and back up Bromley Lane in all directions, but mostly in the AM and PM peak eastbound direction. This will have an effect on all directions, but mostly on the 50th Avenue/Frontage Road intersection, where the queues will spill into each other, clogging up both intersections.

The westbound I-76 off ramp at Baseline Road in the AM and PM peak hours currently does not spill onto the interstate. In 2035 during the AM and PM peak hours, the traffic also does not spill onto the interstate or back up on the off ramp.

The eastbound I-76 off ramp at Baseline Road in the AM and PM peak hours currently does not spill onto the interstate. In 2035 during the AM peak hour, the off ramp will not back up onto the ramp; however, in the PM peak hour, the queue will exceed the length of the off ramp and will spill onto the interstate.

Exhibit 2-12 shows the delay and queue length at intersections with Bromley Lane and Baseline Road that are projected to have long queue lengths on some or all of the approaches in both current conditions (2013) and planning horizon year (2035). Traffic operations are projected to worsen by 2035 and the amount of delay will increase.

Exhibit 2-12. Queue Length Delay Comparison

Intersection	Approach	2013 Existing Conditions (AM/PM)		2035 No-Action Alternative (AM/PM)	
		Delay (seconds/vehicle)	95% Queue Length* (ft)	Delay (seconds/vehicle)	95% Queue Length* (ft)
Bromley Lane					
50th Avenue and West Frontage Road	Eastbound	8.1/9.0	25/50	8.8/12.8	50/175
	Westbound	**	**	**	**
	Southbound ¹	18.2/10.8	150/50	>100/97.4	3250/625
West Frontage Road ²	Eastbound	18.3/40.9	125/375	>100/>100	650/1450
	Westbound	6.2/5.3	75/75	14.1/20.6	150/150
	Northbound	9.1/14.3	25/50	17.2/37.3	25/100
	Southbound	46.0/13.8	350/100	>100/71.0	1,750/450
	Overall	25.1/21.0	n/a	>100/>100	n/a
Westbound I-76 Ramps	Eastbound	**	**	**	**
	Westbound	10.4/9.6	25/25	48.3/22.3	350/150
	Southbound ¹	16.4/16.7	25/25	>100/>100	n/a
Eastbound I-76 Ramps	Eastbound ¹	11.4/19.2	**	23.1/>100	**
	Westbound ¹	18.0/15.8	**	>100/54.5	**
	Northbound ¹	18.8/>100	**	>100/>100	**
	Overall	17.2/66.4	n/a	>100/>100	n/a
Baseline Road					
West Frontage Road	Eastbound	7.7/8.8	25/25	8.3/10.7	25/25
	Westbound	8.1/7.7	25/25	8.8/7.9	25/25
	Northbound ¹	14.6/19.9	25/50	44.0/>100	50/425
	Southbound ¹	35.5/35.3	150/100	>100/>100	4,125/3,250

Intersection	Approach	2013 Existing Conditions (AM/PM)		2035 No-Action Alternative (AM/PM)	
		Delay (seconds/vehicle)	95% Queue Length* (ft)	Delay (seconds/vehicle)	95% Queue Length* (ft)
Eastbound I-76 Ramps	Eastbound	7.8/7.7	25/25	8.6/8.1	25/25
	Westbound	**	**	**	**
	Northbound ¹	10.9/38.5	25/275	16.4/>100	50/1250

* The 95% queue is defined to be the queue length (in vehicles) that has only a 5-percent probability of being exceeded during the analysis time period.

** Highway Capacity Manual (HCM) is limited in calculating values for these movements because the LOS is greater than

F

¹ Stop-controlled approach

² Roundabout

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Chapter 3: Alternatives Analysis

Twelve alternatives (including the No-Action Alternative) were initially considered for the I-76 and Bridge Street Interchange Project. This chapter introduces all the alternatives considered for this project, explains the evaluation and screening process, discusses the alternatives that are being evaluated in this document in detail, and identifies the Preferred Alternative.

3.1 Alternatives Development and Evaluation Criteria

A System-Level Feasibility Study was performed in 2013 to explore different alternatives for access to I-76 at Bridge Street. Twelve alternatives were developed during that study, including the No-Action Alternative. The alternatives considered resulted from agency collaboration, public outreach, and detailed environmental and technical analyses. An open house was held in July 2013 to present these alternatives and to solicit feedback from the public. Attendees included neighborhood/area residents and I-76 commuters.

The alternatives from the System-Level Feasibility Study are discussed and evaluated in this EA. Brighton, CDOT, and FHWA collaboratively established evaluation criteria to assess and compare these 12 alternatives. The comparative process was used to reduce the number of alternatives considered and to identify the Preferred Alternative. The project's evaluation criteria include the following:

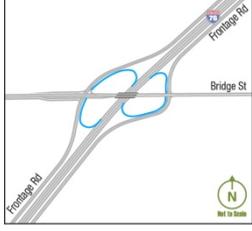
- The ability to meet the project Purpose and Need
- Infrastructure impacts
- Safety
- Drivers' expectations
- Truck traffic accommodation
- Traffic operations
- Impacts to the natural and built environment

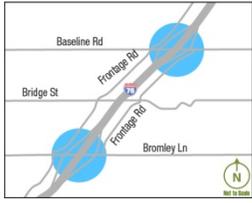
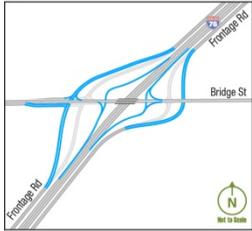
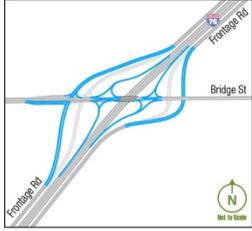
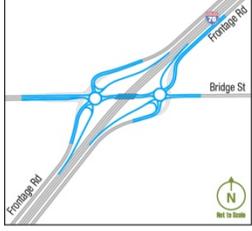
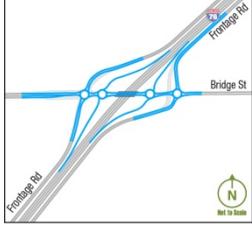
3.2 Description of Initial Alternatives and Summary of Screening Results

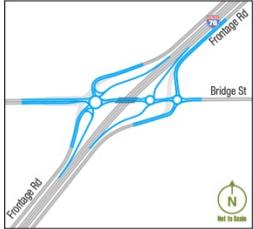
As part of the NEPA process, a reasonable range of alternatives and a No-Action Alternative were considered and evaluated. The term "reasonable" is defined by the Council on Environmental Quality (CEQ) as those alternatives that are "practical and feasible from a technical and economic standpoint using common sense" (CEQ NEPA's 40 Most Frequently Asked Questions). The No-Action Alternative does not meet the Purpose and Need for the project; however, per NEPA requirements, it is fully evaluated in the

document and used as a baseline for comparison. Exhibit 3-1 lists the alternatives that were considered initially.

Exhibit 3-1. Initial Alternatives

Alternative	Alternative Description	Alternative Description
	<p>No-Action</p>	<p>Includes existing, planned, and programmed roadway operations and maintenance improvements in the project area. The No-Action Alternative serves as the baseline for the analysis.</p>
	<p>Slip Ramps to the Frontage Roads</p>	<p>Turns frontage roads into partial collector-distributor roads with controlled stops on the frontage roads so the ramp traffic is free flowing. Auxiliary lanes are added along I-76.</p>
	<p>Modified Cloverleaf Interchange</p>	<p>A tight cloverleaf with signalized intersections at Bridge Street for the ramps and frontage roads. Short auxiliary lanes on I-76 for weaving, exiting, and entering interstate traffic.</p>
	<p>Fly-Over Interchange</p>	<p>Includes fly-over ramps for all movements.</p>
	<p>Half Diamond Interchange</p>	<p>Includes ramps on the southern side of Bridge Street.</p>

Alternative	Alternative Description
	<p>Transportation System Management (TSM)</p>
	<p>Single-Point Urban Interchange</p>
	<p>Tight Urban Diamond Interchange</p>
	<p>Diverging Diamond Interchange</p>
	<p>Two-Roundabout Interchange</p>
	<p>Four-Roundabout Interchange</p>

Alternative	Alternative Description
	<p>Three-Roundabout Interchange</p>

Combines the West Frontage Road and I-76 westbound ramps into a six-legged roundabout. The east side combines the eastbound ramp terminal into a four-legged roundabout and the frontage roads into another four-legged roundabout.

3.3 Screening Process and Results

Screening is the process used to evaluate the effectiveness of potential alternatives. The screening process consists of two stages of screening: Level 1A and Level 1B, which are discussed in more detail below.

3.3.1 Level 1A Screening—Meeting the Project Purpose and Need

During the first stage of the screening process, the project team assessed each alternative to determine whether it would meet the project Purpose and Need. Level 1A of screening resulted in elimination of three alternatives, as presented in Exhibit 3-2. Although the No-Action Alternative does not meet the project Purpose and Need, it was advanced for further evaluation as a baseline against which to compare the other alternatives.

Exhibit 3-2. Level 1A Alternatives Screening Results

Eliminated Alternative	Reason for Elimination
TSM	Does not meet the project Purpose and Need because it does not improve connectivity. This alternative does not address regional connectivity through SH 7 and will divert traffic to the local street network because it does not provide additional connection to I-76.
Fly-Overs Interchange	Does not meet the project Purpose and Need because it compromises traffic flow at adjacent interchanges and in other locations due to design constraints by interfering with the adjacent on and off ramps, causing weaving hazards and introducing operational deficiencies.
Half-Diamond Interchange	Does not meet the project Purpose and Need because it does not fully improve traffic flow and connectivity since it is not a full interchange and does not provide full movement and connectivity to and from I-76.

3.3.2 Level 1B Screening—Other Criteria Considered

In addition to whether the alternative met the project Purpose and Need, other criteria were considered to evaluate and compare the alternatives. Differentiating criteria helped determine which alternatives caused fewer impacts to the environment or had fewer design challenges than other alternatives. Each criterion is summarized below.

Preserve the Existing Infrastructure

FHWA, CDOT, and Brighton recognize the importance of sustainability and utilizing existing infrastructure to improve the roadway network when possible. In particular, the Bridge Street structure extending over I-76 was constructed in 1986 and maintains a CDOT Bridge Sufficiency Rating of 98 percent. Thus, alternatives that preserve this bridge are more desirable in the Level 1B screening process than those requiring new or widened bridges.

Safety

Safety is a top priority for CDOT and FHWA, particularly when introducing new access on the interstate system. The project team evaluated alternatives based on safety, as it was a differentiating factor. Those alternatives with fewer safety issues—such as opportunities for wrong-way travel or minimal weave distances—are more desirable in the Level 1B screening process.

Driver Expectancy

Driver expectancy was considered to be a differentiating factor because drivers could be less familiar with some interchange designs than others. Alternatives that increase a driver's ability to safely and efficiently move through the proposed interchange are more desirable in the Level 1B screening process.

Traffic Operations

All alternatives were designed to accommodate a potential increase in truck and vehicular traffic. Some alternatives had operational deficiencies with regard to queuing, storage, unnecessary traffic signals, and/or weave distances. Because these operational challenges could lead to safety problems and difficulties meeting design standards, alternatives with these consequences are less desirable in the Level 1B screening process.

The second stage of the screening process resulted in elimination of five additional alternatives from further consideration. Exhibit 3-3 shows the alternatives eliminated in Level 1B and the reasons for their elimination.

After elimination of the five additional alternatives in Level 1B, three Action Alternatives and a No-Action Alternative were recommended to move forward for detailed evaluation in this document. These Action Alternatives are discussed in the following section and include:

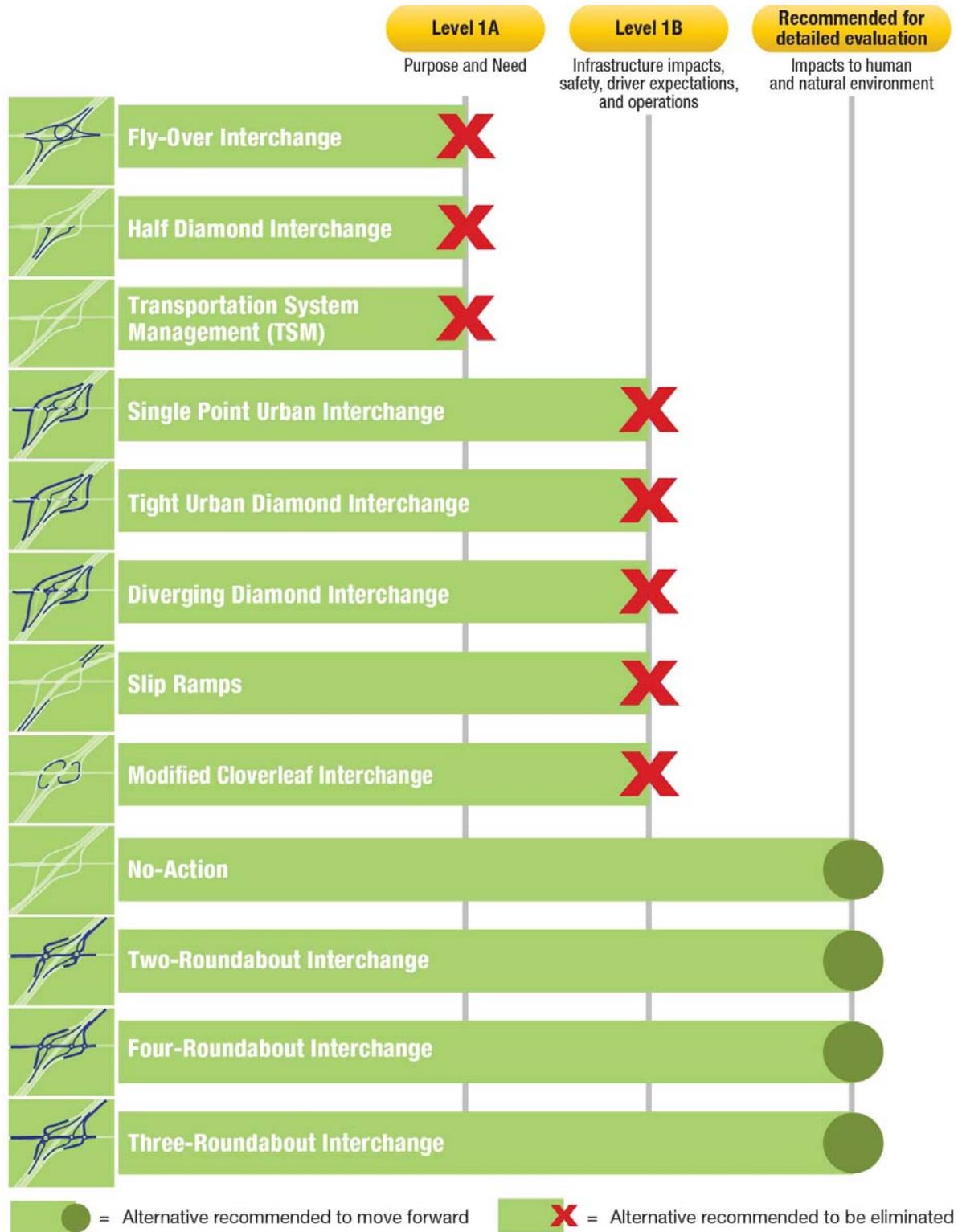
- Two-Roundabout Interchange (Preferred Alternative)
- Four-Roundabout Interchange (Alternative 2)
- Three-Roundabout Interchange (Alternative 3)

Exhibit 3-3. Level 1B Alternatives Screening Results

Eliminated Alternative	Reason for Elimination
Single-Point Urban Interchange	<ul style="list-style-type: none"> • Requires new or widened bridge to accommodate left turn movement, so it does not preserve the existing infrastructure. • Requires realignment of frontage road to meet spacing requirements, so it does not preserve the existing infrastructure. • Requires signalization of the single-point interchange and adjacent frontage roads on Bridge Street and impacts traffic flow, resulting in operational deficiencies.
Tight Urban Diamond Interchange	<ul style="list-style-type: none"> • Requires new or widened bridge to accommodate left-turn movements on Bridge Street, so it does not preserve the existing infrastructure. • Requires realignment of frontage road to meet spacing requirements, so it does not preserve the existing infrastructure. • Requires four traffic signals for the closely spaced intersections, resulting in operational deficiencies. • Safety is compromised with the addition of signalized intersections because of the increase in rear-end and right-angle collisions.
Diverging Diamond Interchange	<ul style="list-style-type: none"> • Requires new bridge for additional lanes to accommodate entering ramp traffic, so it does not preserve the existing infrastructure. • The grades of I-76 and the new bridge may require I-76 to be lowered or excessively raise the grade on Bridge Street to accommodate the additional lanes. Therefore, it does not preserve the existing infrastructure. • Requires realignment of frontage road to meet spacing requirements, so it does not preserve the existing infrastructure. • Signalization and signing is challenging, which impacts both driver expectancy and traffic operations.
Slip Ramps to frontage roads	<ul style="list-style-type: none"> • Drivers are less familiar with this type of interchange; therefore, there are concerns with driver expectancy. There is also the potential for wrong-way movements onto I-76 from the frontage roads, impacting safety. • Safety is compromised since this alternative requires that the frontage road through-traffic will need to be stopped to allow the I-76 exiting traffic to proceed onto the frontage road. • The frontage roads will need to be stop controlled in the counter flow direction of the off ramps to allow the exiting traffic from I-76 to proceed, resulting in operational issues. • Excessive delays in the peak hours at the stop-controlled intersections will increase, causing operational issues.
Modified Cloverleaf Interchange	<ul style="list-style-type: none"> • Tight spacing of ramps makes turn bay storage at Bridge Street intersections inadequate, resulting in traffic operations deficiencies and safety issues caused by the queue overflow to the adjacent lane. • Due to design restrictions, providing full movements and connecting frontage roads/ramps would be difficult without major modifications to existing infrastructure. • The weave length between ramp terminals does not meet minimum standards, resulting in poor traffic operations.

Exhibit 3-4 illustrates the process of comparing the preliminary alternatives, showing which alternatives moved forward for further analysis and which were eliminated.

Exhibit 3-4. Alternative Screening



3.4 Alternatives Recommended for Detailed Evaluation

Following Level 1A and 1B screening, three Action Alternatives—along with the No-Action Alternative—were moved forward for detailed analysis

The Two-Roundabout Interchange Alternative was recommended as the Preferred Alternative, while the Four-Roundabout Interchange is referred to as Alternative 2 and the Three-Roundabout Interchange is referred to as Alternative 3. The following subsections describe these alternatives in more detail.

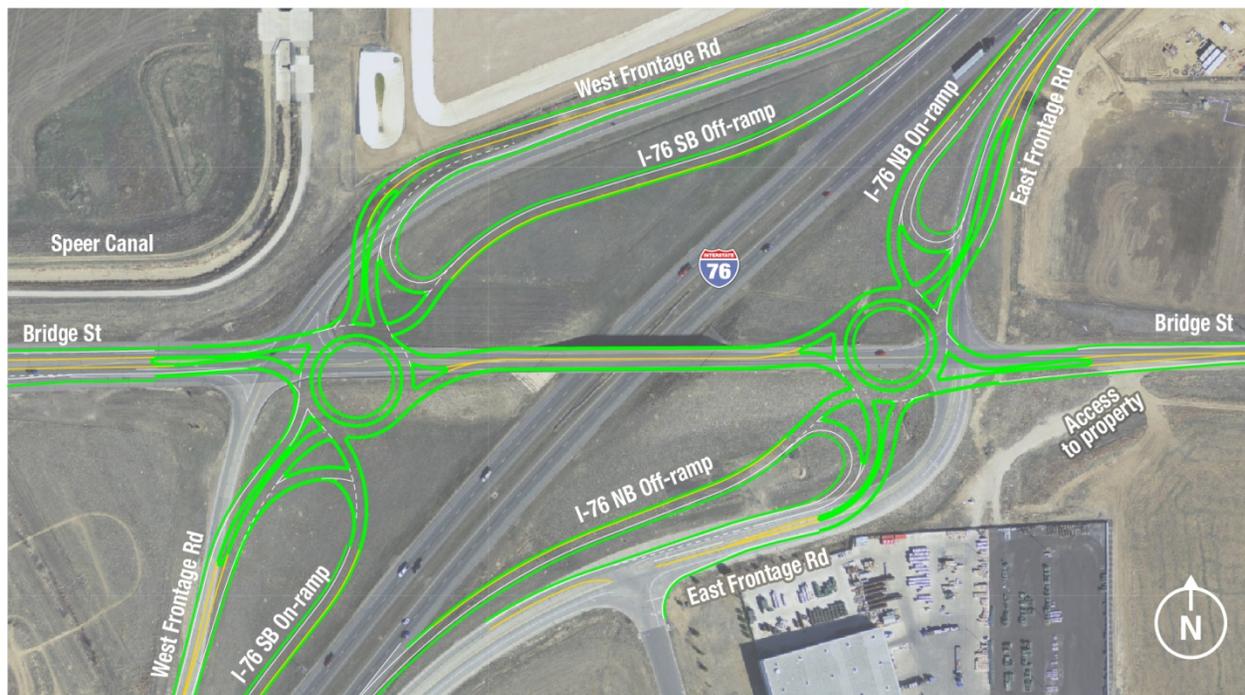
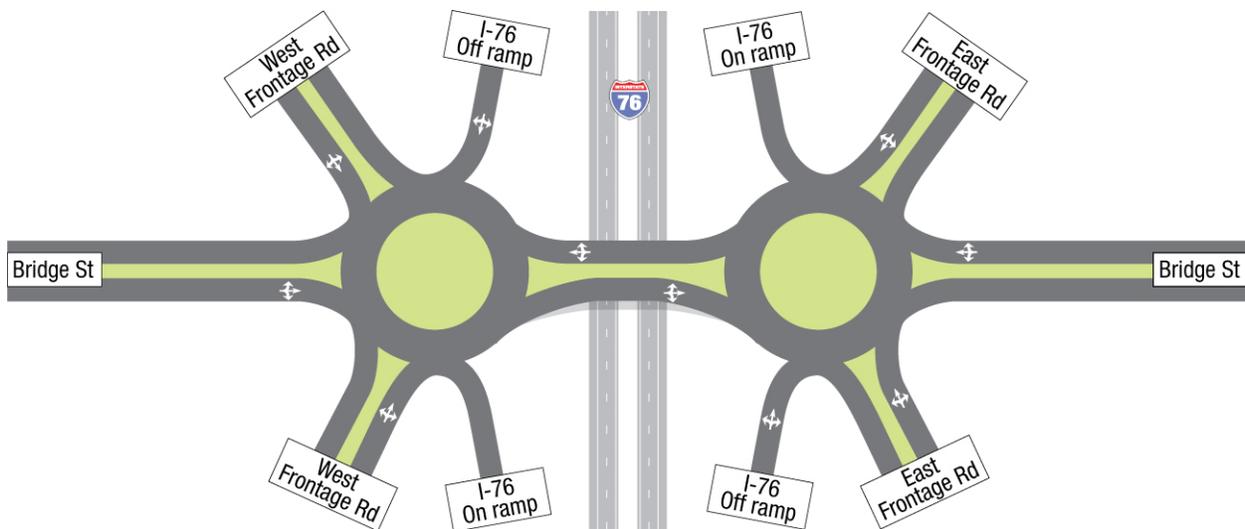
3.4.1 No-Action Alternative

The No-Action Alternative serves as the baseline against which Action Alternatives are evaluated. For the purposes of this study, the No-Action Alternative is defined as the existing facilities within the project area. Under the No-Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

3.4.2 Preferred Alternative: Two-Roundabout Interchange

The Preferred Alternative for this document is the Two-Roundabout Interchange. This alternative combines the frontage roads and ramp terminals to make one six-legged roundabout on each side of I-76 (see Exhibit 3-5). This alternative meets the project Purpose and Need and has only minor impacts to the existing built and natural environment, as will be discussed in Chapter 4, Affected Environment, Impacts, and Mitigation. It preserves the existing bridge, and avoids impacts to the Speer Canal to the northwest of the interchange.

Each roundabout has an outside diameter of 200 feet, including a 12-foot truck apron that provides large vehicles with a pathway through the roundabout, especially truck traffic. Both roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles that will reduce right-of-way impacts and to regulate speed through the roundabout to improve safety. Splitter islands (a raised or painted traffic island that separates traffic in opposing directions of travel) also are included to slow traffic coming into the roundabouts and to help channelize traffic and provide pedestrian refuges when needed. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right-turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. This alternative does not conflict with the access point to the property in the southeast quadrant of the interchange and is expected to operate at LOS B in the horizon year of 2035. Exhibit 3-6 shows the conceptual design and traffic movement pattern of this alternative.

Exhibit 3-5. Preferred Alternative: Two-Roundabout Interchange Alternative**Exhibit 3-6. Conceptual Design and Traffic Movement Pattern of Preferred Alternative****3.4.3 Alternative 2: Four-Roundabout Interchange Alternative**

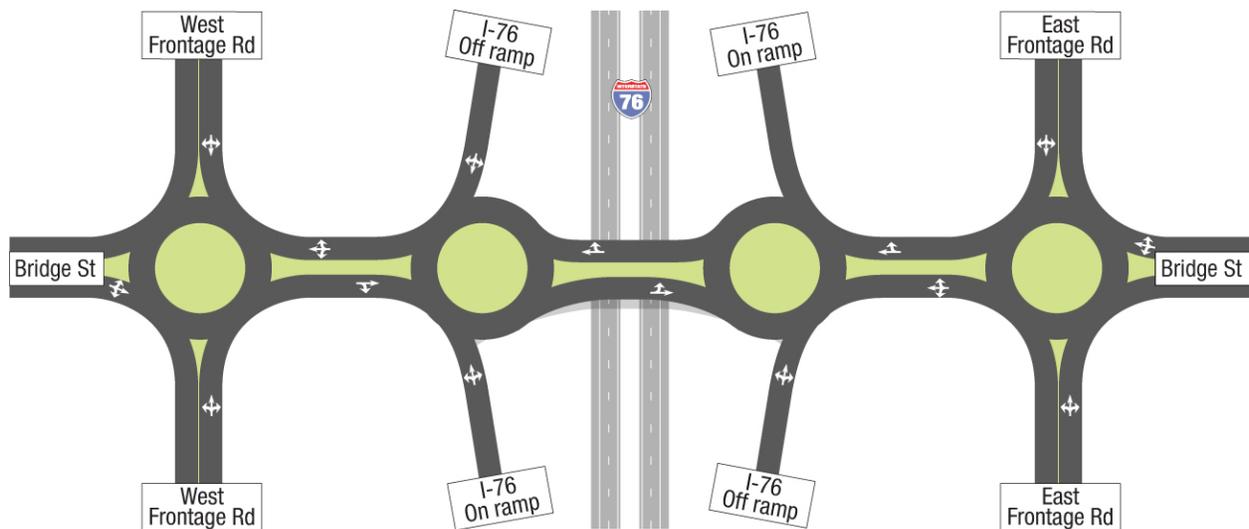
Alternative 2 for this document is the Four-Roundabout Interchange Alternative. This alternative creates two four-legged roundabouts on each side of I-76 (see Exhibit 3-7). This alternative also meets the project Purpose and Need with only minor impacts to the existing built and natural environment, as discussed in Chapter 4, Affected Environment, Impacts, and Mitigation.

Each roundabout has an outside diameter of 150 feet, including a 12-foot truck apron for truck traffic. Each pair of the roundabouts has been placed slightly off center of the existing Bridge Street center line to develop approach angles to reduce right-of-way impacts and to regulate speed through the roundabout to improve safety. Splitter islands also are included to slow traffic coming into the roundabouts and to help channelize traffic and provide pedestrian refuges when needed. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right-turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

This alternative will require construction of a retaining wall next to the Speer Canal on the northwest quadrant of the interchange due to close proximity of the road to the Speer Canal's ditch. It will impact the access point to the property located in the southeast quadrant of the interchange, requiring coordination with the property owner. In addition, there are right-of-way impacts on the northeast quadrant. This alternative is expected to operate at LOS B by the horizon year of 2035. Exhibit 3-8 shows the conceptual design and the traffic movement pattern of this alternative.

Exhibit 3-7. Alternative 2: Four-Roundabout Interchange Alternative



Exhibit 3-8. Conceptual Design and Traffic Movement Pattern of Alternative 2**3.4.4 Alternative 3: Three-Roundabout Interchange Alternative**

Alternative 3 is the Three-Roundabout Interchange Alternative. This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76 (see Exhibit 3-9). The West Frontage Road and I-76 westbound ramps are combined into one six-legged roundabout with an outside diameter of 200 feet, including a 12-foot truck apron. The east side combines the eastbound ramp terminal into a four-legged roundabout and the frontage roads into another four-legged roundabout. The smaller roundabouts on the east side have an outside diameter of 150 feet, including a 12-foot truck apron. This alternative meets the project Purpose and Need with only minor impacts to the existing built and natural environment, as discussed in Chapter 4, Affected Environment, Impacts, and Mitigation.

All roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles to reduce right-of-way impacts and to regulate speed through the roundabout to improve safety. Splitter islands also are included to slow traffic coming into the roundabouts and to help channelize traffic and provide pedestrian refuges when needed. The roundabouts are designed with 18-foot single lanes for circulation and exclusive right-turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. This alternative will impact the access point to the property located in the southeast quadrant of the interchange, requiring coordination with the property owner. In addition, there are right-of-way impacts on the northeast quadrant. This alternative is expected to operate at LOS B by the horizon year of 2035. Exhibit 3-10 shows the conceptual design and traffic movement pattern of this alternative.

Exhibit 3-9. Alternative 3: Three-Roundabout Interchange Alternative

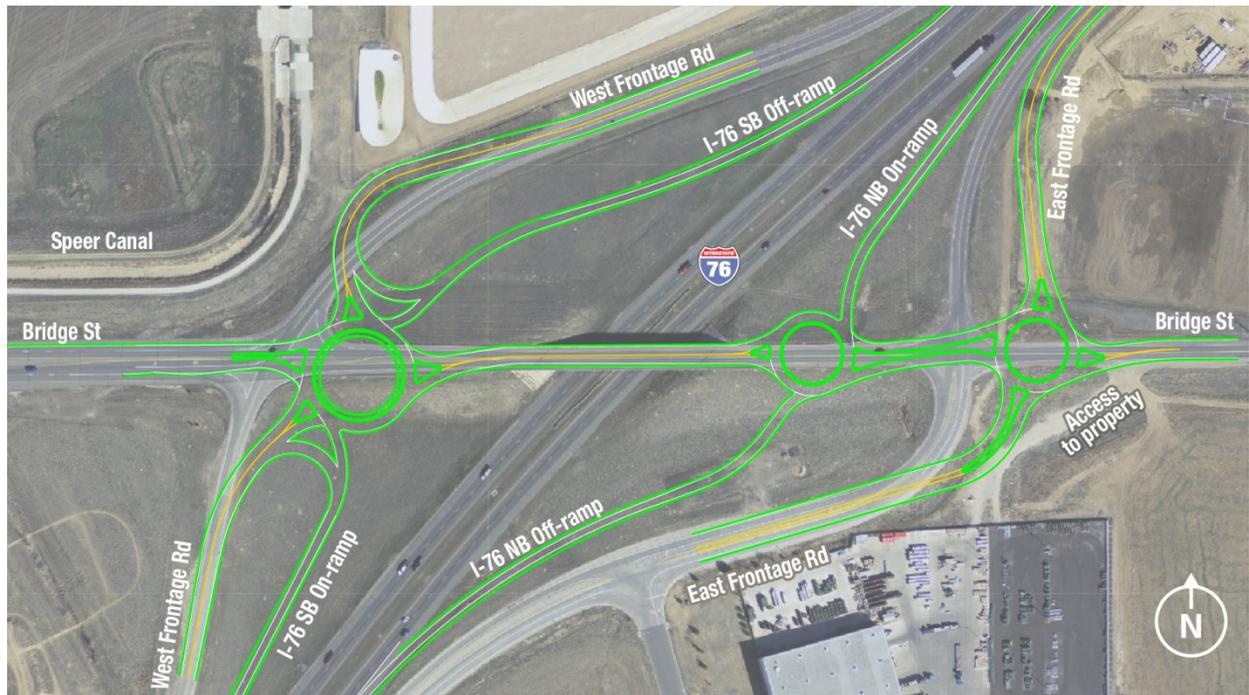
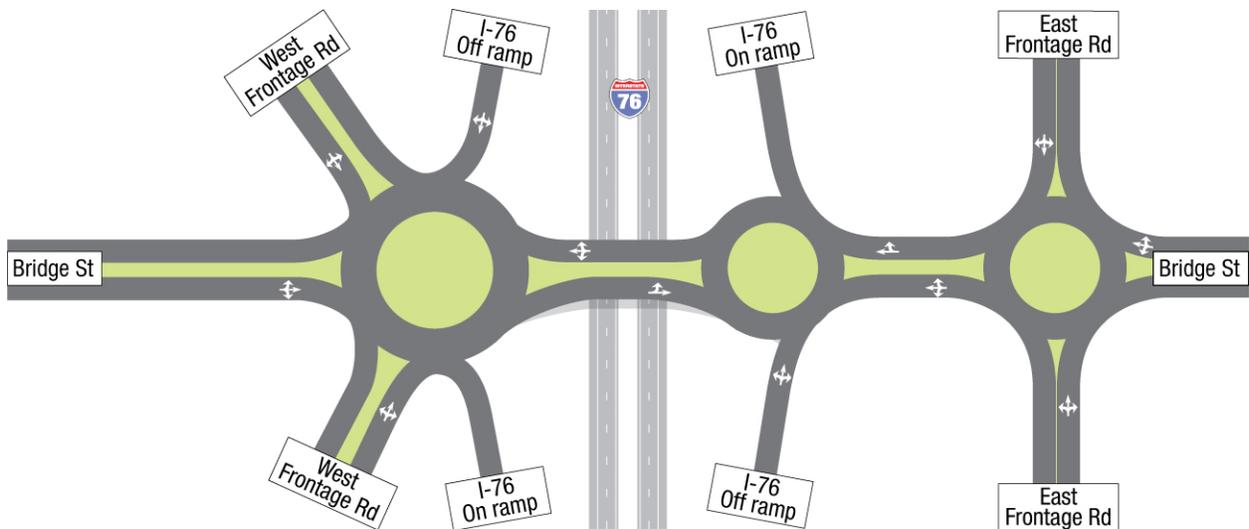


Exhibit 3-10. Conceptual Design and Traffic Movement Pattern of Alternative 3



3.4.5 Other Improvements required with the Action Alternatives

The addition of the interchange at Bridge Street will cause the Bridge Street and Prairie Falcon Parkway intersection to operate poorly due to rerouting traffic. Thus, some improvement measures will be required at this intersection. The Bridge Street and Prairie Falcon Parkway intersection is currently controlled by stop signs on Prairie Falcon

Parkway. With the addition of the interchange at I-76 and Bridge Street, more vehicles will drive on Bridge Street; therefore, the vehicles turning to and from Prairie Falcon Parkway and Bridge Street will have a longer wait at stop signs due to fewer gaps in through-traffic on Bridge Street. Based on traffic analysis, all Action Alternatives require a traffic signal at Prairie Falcon Parkway and Bridge Street to allow for turning vehicles' safe movements by the project's horizon year as part of this project. The signal may not be needed on opening day of the interchange, so it will be installed when it is justified based on the Manual on Uniform Traffic Control Devices requirements.

3.5 Identification of the Preferred Alternative

The Preferred Alternative generally is the one that would best meet the project Purpose and Need; minimize impacts to the social, economic, cultural, and natural environment; and be supported by the public and stakeholders. For this project, all the Action Alternatives meet the project Purpose and Need, have similar impacts to the existing built and natural environment, have similar construction cost, and are supported by the public and stakeholders.

Although all of the Action Alternatives have similar impacts, per Brighton's preference, the Two-Roundabout Interchange Alternative was identified as the Preferred Alternative. This alternative was identified as the Preferred Alternative because:

- It includes only two roundabouts, instead of the three or four roundabouts included in Alternatives 2 and 3. This will simplify signage and markings and drivers' choices by consolidating ramp and frontage road access points into a single roundabout on each side of the highway.
- It is a simpler design with easy construction phasing that will create fewer anticipated traffic impacts during construction compared to Alternatives 2 and 3.
- It accommodates heavy truck turning movements more efficiently than Alternatives 2 and 3.

There are other minor differences between the Preferred Alternative and other Action Alternatives; however, they were not a deciding factor in identification of the Preferred Alternative. These minor differences include:

- The preferred Alternative has no impact on the adjacent Speer Canal in the northwest quadrant of the interchange; therefore, it avoids the need to construct a retaining wall adjacent to Speer Canal, while Alternative 2 requires a retaining wall adjacent to Speer Canal.
- The Preferred Alternative will have permanent right-of-way impacts of 0.24 acre, and no full property acquisitions or relocations will be required. Alternative 2

requires 0.463 acre and Alternative 3 requires 0.108 acre of permanent right-of-way impacts.

- The Preferred Alternative will not conflict with the access point to the property in the southeast quadrant of the interchange, while Alternatives 2 and 3 require modifications to this property's access point.

Chapter 4: Affected Environment, Impacts, and Mitigation

This chapter summarizes the affected environment; discloses how the No-Action Alternative and the Action Alternatives, including the Preferred Alternative, are anticipated to impact the built and natural environment; and identifies the mitigation measures for implementation of the Preferred Alternative. The impact assessment was conducted in accordance with NEPA (42 United States Code [USC] 4332 (2)(c)) and FHWA's *Environmental Impact and Related Procedures* (23 Code of Federal Regulations [CFR] § 771.105). Additionally, both the CDOT *NEPA Manual* (CDOT, 2013) and *Environmental Stewardship Guide* (CDOT, 2005) were used in these analyses, along with applicable resource-specific guidance.

This study evaluated direct impacts and indirect impacts, as well as cumulative impacts, anticipated to result from implementation of the No-Action Alternative or any of the three Action Alternatives based on a conceptual level of design.

Direct impacts are those that are caused by the alternative and occur at the same time and place of the action. Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative impacts are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes these other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time. Temporary impacts are those that may occur for a short duration during the construction phase of the project.

A project area has been identified in Chapter 1, Introduction; it is approximately bounded by Baseline Road on the north, Bromley Lane on the south, 50th Avenue and Tower Road on the west, and Picadilly Road and Harvest Road on the east.

Each resource has a specific study area that is identified in this chapter under each section. For some resources, such as Transportation, the study area is the same as the project area; for many resources, the study area is the same as the construction envelope.

The construction envelope is inclusive of the construction limits for all three Action Alternatives. It includes the physical area that is anticipated to be disturbed during construction, which is the footprint of the Action Alternatives, plus a buffer around it to account for movement and storage of construction equipment, staging of materials, and space to build the design elements.

This chapter is divided into sections discussing impacts, benefits, and mitigation for each environmental resource. Each section includes subsections that explain the policy and guidelines for evaluating that resource, and discusses both common impacts to the resource and impacts that are specific to each alternative. Technical reports documenting resource analysis and agency consultation and outreach activities are included as appendices to this document.

These built and natural environment resources are discussed in the following subsections of this chapter:

- Transportation
- Air Quality
- Traffic Noise
- Land Use and Zoning
- Right of Way, Acquisitions, and Relocations
- Socioeconomics
- Utilities
- Biological Resources
- Wetlands and Waters of the U.S.
- Water Resources and Water Quality
- Hazardous Materials
- Historic Properties

Data collection for the I-76 and Bridge Street Interchange Project determined that the following resources will not be impacted by any of the alternatives:

- Soils and Geology
- Energy
- Farmlands
- Floodplains
- Visual Resources
- Parks and Recreation
- Section 4(f) Resources
- Section 6(f) Resources
- Environmental Justice

See Exhibit 4-1 for an explanation of these resource exclusions.

Exhibit 4-1. Environmental Resources Not Evaluated in Detail

Resource	Reason for Exclusion from Analysis
Soils and Geology	<p>Although soils will be disturbed during construction of the Action Alternatives, disturbance will be minimal and best management practices will be employed to minimize erosion. A review of U.S. Geological Survey (USGS) and Natural Resources Conservation Service (NRCS) soil data indicates that no major geologic hazards or significant and geologically active faults occur in the area (NRCS, 2013). However, swelling soils exist in the area; if necessary, techniques will be applied to improve soil or ground suitability for roadway construction during project design. The project is not likely to be affected by or negatively affect soils and geologic conditions in the area. Therefore, the project will have no direct, indirect, temporary, or cumulative impacts on soils and geology under the No-Action Alternative or the Action Alternatives.</p>
Energy	<p>Energy impacts should be considered throughout the planning, design, development, construction, and use of a transportation project, such as the proposed interchange at I-76 and Bridge Street. During construction of any of the project alternatives, energy will be expended to operate machinery, transport materials, mix and pour concrete, and perform other work tasks. Although energy will be impacted during construction of the Action Alternatives, impacts will be minimal and best management practices will be employed to reduce impacts. Should an Action Alternative be implemented, reduced congestion could result in energy savings. Therefore, the project could have beneficial direct, indirect, temporary, or cumulative impacts on energy resources.</p>
Farmlands	<p>Farmlands are a valuable economic and cultural resource and are protected by the Farmland Protection Policy Act, 7 CFR Part 658. According to Part 658.2, Farmlands do not include:</p> <ul style="list-style-type: none"> • Lands already in or committed to urban development; or • Lands identified as “urbanized area” (UA) on the Census Bureau Maps. <p>The construction envelope is exempt from the Farmland Protection Policy Act, though the land has been used historically for agricultural activities, because the land is zoned for future development as residential, commercial, and industrial under current local comprehensive plans, including the City of Brighton 2020 Comprehensive Plan and DRCOG 2035 MVRTP (Brighton, 2012 and DRCOG, 2011). Therefore, the project will have no direct, indirect, temporary, or cumulative impacts on farmlands under the No-Action Alternative or the Action Alternatives.</p>
Floodplains	<p>A review of Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Maps showed that no delineated flood zones exist within the construction envelope (FEMA, 2013, Map Panel #08001C0355H). Therefore, the project will have no direct, indirect, temporary, or cumulative impacts on mapped floodplains under the No-Action Alternative or the Action Alternatives.</p>

Resource	Reason for Exclusion from Analysis
Visual Resources	<p>No visually sensitive resources currently exist in the area. No impacts are expected to contrast with the visual character of the area or obstruct any key views. Therefore, the project will have no direct, indirect, temporary, or cumulative impacts on visual resources.</p> <p>While the standalone project will have no impacts on visual resources, the construction of new infrastructure provides an opportunity to enhance the visual character and aesthetics of the area through added vegetation.</p>
Parks and Recreation	<p>No trails or parks currently exist in the construction envelope. Dewey Strong Park is located approximately 800 feet to the south of Bridge Street on the west side of the I-76 frontage ramp.</p> <p>According to the City of Brighton Greenways and Trails Master Plan (Brighton, 2004), the I-76 Trail is proposed and will pass through the construction envelope. The trail generally will follow the west side of I-76, within existing CDOT right of way and connect to the Speer Canal Trail to the west of the project.</p> <p>The Bridge Street Trail is another proposed facility that would cross I-76 on Bridge Street, providing a pedestrian link between the east and west sides of the interstate. Neither funding nor a construction date for either of the trails has been identified.</p>
Section 4(f) Resources	<p>Section 4(f) of the Department of Transportation Act protects significant publicly owned parks, recreation areas, and wildlife and waterfowl refuges, as well as significant historic sites, whether they are publicly or privately owned. Future facilities, if in an approved plan such as a Master Recreation Plan, are afforded the same protection as existing parks and trails. The implementation of any of the Action Alternatives will not preclude the design and construction of either trail. Therefore, the project will have no direct, indirect, temporary, or cumulative impacts on Parks and Recreational resources protected under Section 4(f).</p> <p>Additionally, there are no historic resources present in the Area of Potential Effect that are eligible for or listed on the National Register of Historic Places. As such, historic resources protected under Section 4(f) will not be impacted.</p>
Section 6(f) Resources	<p>Land that was purchased or improved with Land and Water Conservation Funds is not present in the construction envelope.</p>
Environmental Justice	<p>Environmental Justice populations are present where:</p> <ul style="list-style-type: none"> • The minority or low-income population of the affected area exceeds 50 percent; or, • The minority or low-income population percentage of the affected area is meaningfully greater than the minority population or low-income percentage in the general population or other appropriate unit of geographical analysis. <p>For this analysis, the state, county, and city percentages were compared to the census data, determining that there are no low-income and/or minority populations in the project area.</p>

4.1 Transportation

Transportation effects result from the impact of an action on the roadway network, including the users of the system. This section examines the impacts of the No-Action Alternative and Action Alternatives on transportation facilities within the project area. The study area for transportation is the same as the project area. See Chapter 1 for the limits of the project area. Transportation facilities include roadways, transit facilities and services, pedestrian and bicycle facilities, truck routes, and rail freight infrastructure and service.

4.1.1. What is the affected environment?

The existing transportation system in the project area is multi-modal and includes roadways, transit facilities and services, pedestrian and bicycle facilities, truck routes, and rail freight infrastructure and service. The project area is at a critical location in the transportation system, serving regional and local transportation needs for human and freight mobility within the Denver region and across Colorado. The project area was selected to include one interchange in each direction along the interstate from the location of the proposed interchange. From the location of the proposed Bridge Street interchange, adjacent interchanges are at Bromley Lane and Baseline Road. In addition, surface streets should be analyzed to the first signalized or major intersection beyond any interstate ramp junctions.

The Bridge Street overpass is approximately 1.25 miles north of the existing I-76 and Bromley Lane interchange and approximately 1.5 miles south of the existing I-76 and Baseline Road interchange. The current interchange spacing (approximately 2.5 miles between Bromley Lane and Baseline Road) is within accepted American Association of State Highway and Transportation Officials (AASHTO) guidelines.

The following sections describe the current multi-modal transportation system within the project area, the assessment of existing safety conditions, existing traffic volumes and patterns, and the results of the operational analysis.

Existing Roadway Facilities

The following is a brief description of the roadways that are contained within the boundaries of the project area based on their classifications in the DRCOG Regional Travel Demand Model.

I-76

I-76 is a four-lane interstate highway with a depressed median. The highway connects Interstate 70 (I-70) to the west with Interstate 80 (I-80) to the east. I-76 also intersects I-25 just north of downtown Denver and US 85 just south of Brighton. I-76 is defined as an east-west highway even though its orientation through Brighton is north-south.

I-76 is classified as FW: “Interstate System Freeway Facility,” according to the CDOT highway access code. The facility is located in flat and rolling terrain from the beginning of the segment on the south end of the project area to the Baseline Road interchange. The section of I-76 northeast of the Baseline Road interchange is considered “Rural Interstate.”

Currently, there are full movement interchanges on I-76 in the project area at Bromley Lane and Baseline Road, with Bridge Street being grade separated over I-76. Additional full movement interchanges are located one and two miles to the south of Bromley Lane, at 144th Avenue and 136th Avenue, respectively. State Highway 52 (SH 52), the first interchange north of the project area, is a full-movement interchange and is located six miles to the north of Baseline Road.

I-76 Frontage Roads

Two-lane frontage roads exist along both the east and west sides of I-76 between the Bromley Lane and Baseline Road interchanges. The West Frontage Road continues north of Baseline Road and south of Bromley Lane, but the East Frontage Road terminates at these roadways. The frontage roads allow traffic to circulate between the existing interchanges and Bridge Street, which does not have direct access to I-76.

Bromley Lane

Bromley Lane is a major east-west thoroughfare serving residential and commercial trips to Brighton. Bromley Lane is classified as a multi-lane “Principal Arterial” west of I-76 and a two-lane “Collector” east of I-76. The existing Bromley Lane overpass at I-76 is two lanes wide. Bromley Lane currently has a high density of access locations in the vicinity of the I-76 interchange and to the west toward Tower Road. There are a total of 13 full- and partial-movement access locations along Bromley Lane between Tower Road and the East Frontage Road (approximately one mile). Picadilly Road is the first major access location east of the East Frontage Road.

Bromley Lane provides full-movement access to/from I-76 via a diamond interchange. Bromley Lane passes over I-76 and intersects at a roundabout intersection with the West Frontage Road west of the southbound on ramp. Bromley Lane intersects with the northbound exit on and off ramps at a stop-controlled intersection. The intersection of Bromley Lane and the East Frontage Road is stop controlled.

Bridge Street

Bridge Street is a two-lane, east-west “Principal Arterial” in the project area. Bridge Street provides Brighton with direct access to I-25 and the northern portion of Thornton, as well as Broomfield and Boulder, all to the west of I-76. The existing Bridge Street overpass at I-76 is two lanes wide and there is no access to I-76. Bridge Street intersects with the West Frontage Road and East Frontage Road at stop-controlled intersections.

There are a total of seven major access locations on Bridge Street within the project area between 50th Avenue and Gun Club Road, which is a distance of about one mile.

Baseline Road

Baseline Road is an east-west roadway that is classified as a two-lane “Minor Arterial” west of I-76, and a two-lane “Collector” east of I-76. The existing Baseline Road overpass at I-76 is two lanes wide. Baseline Road provides full movement access to/from I-76 in the form of a standard diamond interchange. Baseline Road intersects with the West Frontage Road and East Frontage Road at stop-controlled intersections.

Baseline Road has a total of 10 access locations between 50th Avenue (to the west of I-76) and the East Frontage Road (approximately one mile). Harvest Road is the first major access location east of the East Frontage Road.

50th Avenue

Classified as a two-lane “Minor Arterial,” 50th Avenue is a north-south roadway that runs between Baseline Road and the West Frontage Road near the Bromley Lane interchange. 50th Avenue provides direct access to large residential areas located just west of I-76 between Bromley Lane and Baseline Road. This arterial provides the shortest route for residents north of Bridge Street to access I-76 at the Bromley Lane interchange.

Existing System Connectivity and Access

North-south regional connectivity in the project area is limited to two access points to I-76, one at Bromley Lane and one at Baseline Road. This limited connectivity affects the mobility of regional trips, local trips, and emergency vehicles. Trips with origins or destinations along Bridge Street are forced to use the Bromley Lane and Baseline Road interchanges and other surface streets in the project area. This increases travel times (creating longer trip lengths due to out-of-direction travel) and traffic volumes at these interchanges and on the surface streets between the interchanges.

Existing Transit Services

No transit routes currently travel over the Bridge Street overpass; however, Regional Transportation District (RTD) Bus Route 120 and Bus Route R/RC/RX operate along Bridge Street, 50th Avenue, and Bromley Lane west of the proposed interchange (see Exhibit 4.1-1).

Exhibit 4.1-1. RTD Bus Route 120 and Bus Route R/RC/RX



Source: RTD, 2014

Existing Pedestrian and Bicycle Facilities

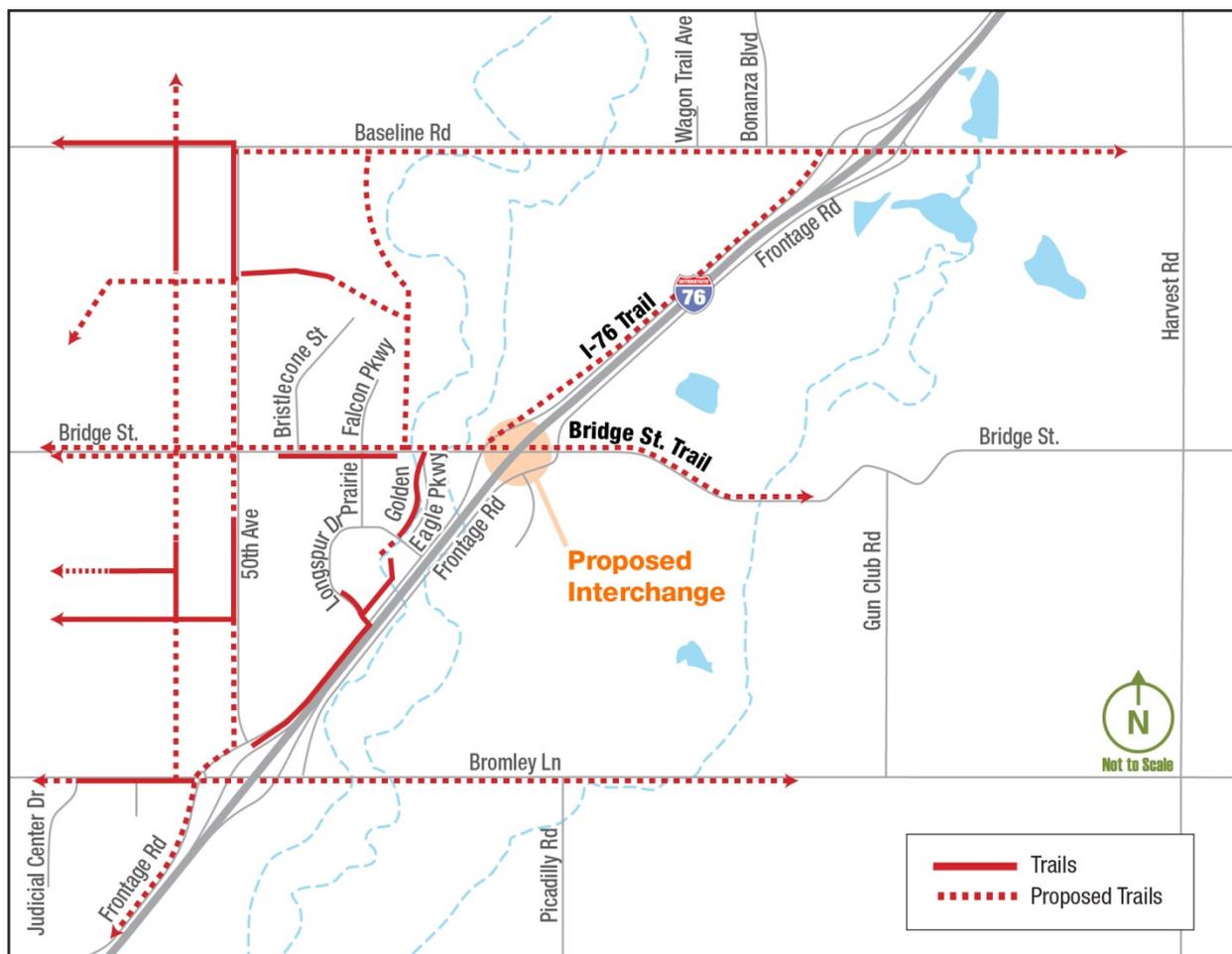
Brighton requires new developments to construct sidewalks on lots located adjacent to major or minor arterials or collectors, or adjacent to primary transportation routes to a public or private school within the city limits. Thus, sidewalk connections within the project area are driven by development. This concurrent process has resulted in gaps within the existing sidewalk system where development has not occurred yet. Where they do exist, sidewalks generally are separated from roadways and range from five feet to 10 feet in width. A 10-foot-wide paved path extends from 50th Avenue to Larkspur and is located approximately 50 feet away from the West Frontage Road.

As indicated by Brighton’s sidewalk policy, sidewalks are a valuable asset to the community.

The City of Brighton Parks and Recreation Department developed the Greenways and Trails Plan with the mission, “to create an integrated system of high-quality multi-use

trails, greenways, bicycle, and pedestrian routes serving the people of Brighton and the surrounding communities. The system should link to enhance the larger regional and statewide trail system.” There are no existing bike lanes through the proposed interchange on Bridge Street or on the frontage roads. There are two planned, multi-use trails through the proposed interchange: one on I-76 and one on Bridge Street (see Exhibit 4.1-2).

Exhibit 4.1-2. Existing and Proposed Trails in the Project Area



Source: City of Brighton Greenways and Trails Plan, 2014

The planned Bridge Street Trail extends beyond I-76. It will have a concrete surface, and is expected to be funded by developers as properties are developed. Portions of the trail have been constructed as 10-foot-wide paved paths separated from the roadway.

The nine-mile I-76 Trail follows I-76 along its length from Baseline Road to 112th Avenue using the transportation right of way, except for a one-mile portion shared with the proposed Prairie Center Parkway on-street trail. The proposed trail is planned to have a concrete surface.

Existing Truck Routes

Brighton has designated the following truck routes within the project area: I-76, Bridge Street, Baseline Road, Bromley Lane, and 50th Avenue (see Exhibit 4.1-3).

Exhibit 4.1-3. Truck Routes in the Project Area



Source: City of Brighton, 2013

Vehicle classification data were collected for a 24-hour weekday period (see Appendix A, *Transportation Technical Report*). The truck traffic percentages in the project area range between 4 percent and 27 percent on all roadways. I-76 is a major shipping route for destinations to the north along I-80, which is consistent with the high percentage (27 percent) of truck traffic on I-76. The land along I-76 east to Nebraska and north of Brighton has less residential development compared to the rest of Brighton and south to Denver. This causes the truck percentages to be relatively high. The observed percentages are likely

to decrease due to the future influx of residential and commercial land uses and the associated increase in passenger car traffic volumes.

Truck percentages on all roads east of I-76 and on Bridge Street west of I-76 are consistently higher than 10 percent because these roads have lower overall volumes compared to other facilities in the area. The data indicate trucks are using the frontage roads between Bridge Street and Baseline Road to gain access to/from I-76.

Methodology Used for Traffic Data Collection

To complete the traffic analysis, an extensive traffic data collection effort was undertaken in April 2013 for the project area. Data collected included:

- 24-hour average daily traffic (ADT) volumes
- Peak-hour (AM/PM) intersection turning movement counts (TMCs)
- 24-hour classification data

The results of this data collection are presented in detail in Appendix A, *Transportation Technical Report*.

The ADT data were collected over a 24-hour weekday period to represent typical traffic volumes and avoid possible atypical traffic patterns that may occur on the weekends.

The ADT counts provide a baseline for evaluating existing 2013 conditions and are used to help calibrate the travel demand models for future years. Based on the ADT counts, the peak hour for traffic volumes was determined to be from 7:00 a.m. to 8:00 a.m. for the AM (morning) peak and from 5:00 p.m. to 6:00 p.m. for the PM (evening) peak.

The peak-hour TMCs are used to help evaluate the operations of intersections under 2013 conditions. The existing TMCs also are used to develop future-year turning movement volumes. The TMC data were collected between the hours of 7:00 a.m. and 8:00 a.m. and from 5:00 p.m. to 6:00 p.m. on a Wednesday to represent typical weekday traffic volumes. The peak hours when TMCs would be affected were identified by Brighton staff based on their familiarity with traffic conditions in the area.

Existing 2013 Traffic Conditions

An operational analysis was completed for the 2013 existing conditions based on the collected data and using Highway Capacity Software (HCS). A detailed discussion on the methodologies and analysis tools used to complete the evaluation of existing and future conditions can be found in Appendix A, *Transportation Technical Report*.

The model provided the following results:

- For existing conditions, all of the basic freeway mainline segments and ramp merge/diverge areas operate at LOS B or better during AM and PM peak hours.
- The majority of the intersection approaches along Baseline Road currently operate at LOS B or better.
- The high volume of side-street traffic combined with single-lane approaches results in delays, queuing, and LOS E at the following locations:
 - The southbound approach of the West Frontage Road to Baseline Road during the AM and PM peak hours
 - The northbound approach of the eastbound ramp intersection to Baseline Road during the PM peak hour

Analysis indicates that Bridge Street is currently operating with volume levels well below the roadway capacity. Almost all intersections and approaches achieve LOS B or better during both AM and PM peak hours; therefore, currently there are no congestion, delay, or traffic flow issues on Bridge Street.

The amount of delay experienced by users of the transportation network as they travel through the intersections in the vicinity of I-76 or within the greater interchange areas indicates which areas may be experiencing congestion, operational issues, and increased potential for safety issues. Delay was calculated for the vehicles that use the existing Bromley Lane and Baseline Road interchanges and those that pass through the Bridge Street intersections near the location of the proposed interchange. The following is a list of the intersections included in the interchange area delay calculation:

- Bromley Lane at West Frontage Road, I-76 westbound ramps, I-76 eastbound ramps, and East Frontage Road; West Frontage Road at 50th Avenue
- Bridge Street at West Frontage Road and East Frontage Road
- Baseline Road at East Frontage Road, I-76 westbound ramps, I-76 eastbound ramps, and West Frontage Road

For this analysis, the actual delay values from HCS—even those in excess of 100 seconds—were used to compute the delay by each approach to the intersections. The maximum value for several approaches exceeds the maximum threshold for HCS, indicating substantial delay/congestion. The results of the intersection delay analysis are shown in Exhibit 4.1-4.

The majority of the delay occurs at the Bromley Lane interchange, which is consistent with the higher volumes being served by this interchange and roadway.

Exhibit 4.1-4. 2013 Intersection Delay Analysis Results

Interchange/Intersection	Total Delay (vehicle-hours/day)	
	AM	PM
Baseline Road	6.4	11.5
Bridge Street	1.4	1.9
Bromley Lane	20.2	39.8
Total	28.0	53.2

In existing conditions, the motorists are traveling from Bridge Street south to Bromley Lane, or vice versa, to gain access to/from I-76. Existing travel patterns indicate that motorists are currently using 50th Avenue to travel between Bridge Street and Bromley Lane. This trip is shown as Route 1 and Route 2 in Exhibit 4.1-5.

Travel times were computed by assuming vehicles are free flowing (traveling at the posted speed limits) between intersections. Then, the delay at each intersection along the route was added to the free-flow time to get a total trip time. For this analysis, the delay at the intersections was limited to no more than 100 seconds per vehicle, which is near the upper limits of the HCS threshold. Exhibit 4.1-6 shows the results of the existing travel time analysis for Routes 1 and 2. Under existing conditions, all trips between I-76 south of Bromley Lane and the 50th Avenue/Bridge Street intersection take more than 3.7 minutes (187 seconds) during the peak hours.

Exhibit 4.1-5. 2013 Peak Hour Travel Time Routes



Exhibit 4.1-6. 2013 Travel Time Analysis Results for Routes 1 and 2

Condition	Travel Time (seconds per vehicle)			
	Route 1		Route 2	
	AM	PM	AM	PM
2013 Existing	224	190	214	207

Summary of 2013 Existing Conditions Analysis

The 2013 existing conditions indicate several issues in the current transportation system within the project area. Improvements are needed to address travel delay, distribute traffic efficiently, and support increased travel demands.

The results of the analysis show:

- The majority of the transportation system currently operates at LOS D or better
- Some of the transportation network elements, particularly at the Bromley Lane interchange, are beginning to show signs of congestion and are operating at LOS E/F during the peak hours
- Existing volumes on all segments of I-76 are well below the daily and hourly capacity levels of a four-lane freeway (192,000 vehicles per day for two-way traffic)

4.1.2. What are the impacts to transportation?

To evaluate the impacts of adding an interchange to I-76 at Bridge Street, a series of traffic operations analyses were completed. Horizon year projected traffic volumes were developed using the DRCOG 2035 regional travel demand model that was calibrated based on 2013 existing conditions traffic data, and expected development based on input from Brighton staff. The 2035 model volumes were adjusted using National Cooperative Highway Research Program (NCHRP) Report 255 techniques and then further adjusted to account for local traffic movements, intersection balancing, flows through interchanges, driveways, local road access, and other factors. A complete discussion on the methods for developing the future projected traffic volumes can be found in Appendix A, *Transportation Technical Report*.

Impacts to System Connectivity and Access

Connectivity in the project area will improve with the addition of a new access point at I-76 and Bridge Street. This access point will increase redundancy in the system and benefit mobility for regional trips, local trips, and emergency vehicles. Trips with origins or destinations along Bridge Street will have direct access to the interstate system and will no longer need to utilize frontage roads and additional surface streets to make regional connections. This will decrease travel times (shorter trip lengths with less out-of-direction travel) and traffic volumes at the Bromley Lane and Baseline Road interchanges and on the surface streets between the interchanges.

Impacts to Transit Service

No transit routes currently extend over the Bridge Street overpass. The addition of a new access point at I-76 and Bridge Street may provide an opportunity for RTD to adjust bus routes, schedules, and stops to provide more efficient service to the eastern Brighton area. Buses traveling in traffic will be impacted by changing travel patterns, though no direct or

negative impacts are anticipated along Bridge Street, 50th Avenue, or Bromley Lane west of the proposed interchange. No RTD rail line is planned for this project area.

Impacts to Pedestrian and Bicycle Facilities

Brighton requires new developments to construct sidewalks on lots located adjacent to a major or minor arterial, a collector, or adjacent to a primary transportation route to a public or private school within the city limits. The proposed interchange at I-76 and Bridge Street will not preclude or disrupt any existing or future investments in pedestrian and bicycle facilities in eastern Brighton.

According to CDOT's bicycle policy directive and Roadway Design Guide, bicycles are permitted on Bridge Street and the surrounding street network, with the exception of on I-76. The policy's directive is to provide transportation infrastructure that accommodates bicycle and pedestrian use of the highways in a manner that is safe and reliable for all highway users. The needs of bicyclists and pedestrians will be included in the planning, design, and operation of transportation facilities, as a matter of routine.

Under the Preferred Alternative, small direct positive impacts will occur from sidewalks and improved traffic operations. Positive indirect impacts may potentially occur from individuals using pedestrian and bicycle facilities to avoid the traffic congestion.

Impacts to Truck Routes

The proposed interchange at I-76 and Bridge Street will not impact the truck routes designated by Brighton. The Preferred Alternative is designed to accommodate trucks so that Bridge Street will continue to serve truck freight both locally and regionally. The additional access point to the interstate will benefit trucks by providing more direct routes to destinations and the interstate. Overall truck percentages are expected to remain consistent within the project area. However, truck percentages along the frontage roads are expected to decrease as a more direct regional connection is available.

Impacts to Safety

Safety is a critical consideration in determining the Preferred Alternative for the proposed interchange. No direct impacts to safety along I-76 or surrounding surface roads are anticipated with the addition of a new access point. In fact, the additional access point will benefit emergency response vehicles. The interchange and all conflict points will have adequate lighting; details on the exact locations and type of lighting will be decided in final design. More information on safety impacts is available in Appendix A, *Transportation Technical Report*.

The roundabouts are designed to improve safety and mobility in east Brighton. The Preferred Alternative meets driver expectations, limits conflict and decision points through the roundabouts, and provides a clear, direct route between I-76 and Bridge Street.

4.1.3. What were the results of the analysis for the 2035 No-Action Alternative?

As a result of growth in the area, the density in all segments between 2013 and 2035 increases along with traffic volumes. The majority of the basic freeway segments and ramp merge/diverge areas operate at LOS B or better during both peak hours, with the following exceptions:

- Westbound I-76 south of Bromley Lane operates at LOS D in the AM peak hour compared to LOS B in 2013
- Eastbound I-76 south of Bromley Lane operates at LOS C in the PM peak hour
- The Bromley Lane to westbound I-76 merge area operates at LOS C in the AM peak

The majority of intersection approaches at Baseline Road will operate at LOS C or better in 2035, with the following exceptions:

- The northbound and southbound approaches of the West Frontage Road to Baseline Road will operate at LOS E/F in the AM and PM peak hours. The volumes on Baseline Road reduce the number of available gaps for the vehicles turning left from the Frontage Road onto Baseline Road and will result in increased delays and queues on these approaches.
- The northbound approach of the I-76 eastbound ramp intersection will operate at LOS F in the PM peak hour. The stop-controlled approach will result in increased delays and queues.
- The eastbound off ramp queues are expected to be 1,250 feet long in the PM peak hour, compared to 275 feet in length currently during the PM peak hour. The eastbound off ramp is approximately 1,500 feet long, so spillback of the queue onto mainline I-76 still is not expected to occur.

Almost all intersections and approaches along Bridge Street will operate at LOS D or better in the 2035 No-Action Alternative AM and PM peak hours, with the following exceptions:

- The northbound approach of 50th Avenue will operate at LOS F with increased queues during the PM peak. This is due to the high volume of left-turning traffic using 50th Avenue from the Bromley Lane interchange to access westbound Bridge Street.
- The overall intersection operations at 50th Avenue during the PM peak will degrade from LOS B in 2013 to LOS F in 2035.

The projected traffic volume being processed by the intersections at Bromley Lane will result in increasing levels of congestion and LOS E/F at several intersections:

- The southbound approach of 50th Avenue at the West Frontage Road will degrade from LOS B/C in 2013 to LOS F/F in 2035.
- The southbound approach at the westbound ramps will degrade to LOS F/F in the peak hours. The westbound approach of Bromley Lane will operate at LOS E in the AM peak hour at this location. Queuing on the ramp will spill back onto mainline I-76, which will impact I-76 safety and operations.
- The roundabout at the West Frontage Road will degrade in operations to LOS F in both the AM and PM peak hours. Operations of 50th Avenue and the West Frontage Road will be negatively affected by queuing that will spill back from the roundabout.
- All of the approaches and the overall intersection at the eastbound I-76 ramps will operate at LOS F in both the AM and PM peaks. The operations at this intersection will cause queues onto mainline I-76, which will impact safety and operations.

The results of the 2035 No-Action Alternative interchange delay analysis are shown and compared to the existing condition in Exhibit 4.1-7. Total delay will increase substantially over the 2013 levels due to the increase in traffic volumes projected to use the roadway network.

- The Bromley Lane interchange area still will account for more than half of the overall delay
- The minimal traffic growth will result in minimal increases in delay along Bridge Street

The results of the delay analysis indicate drivers using the existing interchanges to access Brighton will experience increased delays and queues.

Exhibit 4.1-7. Comparison of 2013 Existing Conditions and 2035 No-Action Alternative Interchange Area Delay

Condition	Interchange	Total Delay (vehicle-hours/day)	
		AM	PM
2013 Existing	Baseline Road	6.4	11.5
	Bridge Street	1.4	1.9
	Bromley Lane	20.2	39.8
	Total	28.0	53.2
2035 No-Action Alternative	Baseline Road	442.3	486.2
	Bridge Street	1.8	3.7
	Bromley Lane	666.1	996.3
	Total	1,110.2	1,486.2

As traffic volume grows between 2013 and 2035, so will the amount of delay at many of the intersections in the project area, as indicated by the results of the operational and delay analyses. Without additional access to I-76 at Bridge Street, the preferred routes used by motorists to circulate through the area will experience increased trip times. Exhibit 4.1-8 shows the results of the travel time analysis using the same routes for existing conditions and the 2035 No-Action Alternative.

Exhibit 4.1-8. Comparison of 2013 Existing Conditions and 2035 No-Action Alternative Interchange Area Delay

Condition	Travel Time (seconds per vehicle)			
	Route 1		Route 2	
	AM	PM	AM	PM
2013 Existing	224	190	214	207
2035 No-Action Alternative	376	377	412	423

*Refer to Exhibit 4.1-5 for a description of the routes.

4.1.4. What were the results of the analysis for the 2035 Action Alternatives?

This section describes the expected changes to the transportation network operations with the proposed interchange in 2035 at I-76 and Bridge Street. An operational analysis was completed for the different proposed Action Alternatives for the I-76 and Bridge Street interchange, which includes the addition of two ramp terminals and improvements to the existing frontage road intersections. As previously described, the alternatives under evaluation include the addition of two, three, or four roundabouts to accommodate the vehicle movements at the frontage roads and new ramp termini.

The analysis for each alternative was performed with the ARCADY model in Junctions 8 roundabout design and capacity analysis software. Preliminary geometric parameters were used with a 10-percent capacity reduction to correlate the results to recent U.S. traffic observations and provide conservative results. In addition to the ARCADY analysis, a Highway Capacity Manual (HCM) 2010 analysis was conducted in Junctions 8 to provide a comparison to the ARCADY results.

The results of the operational analyses for 2035 Action Alternatives are available in detail in Appendix A, *Transportation Technical Report*. All of the roundabouts in the three Action Alternatives will operate at LOS B or better in 2035, with a majority of the approaches and overall intersections operating at LOS A. Although the delay varied slightly between the three Action Alternatives, the operational results for all three Action Alternatives were the same.

The majority of the basic freeway segments and ramp merge/diverge areas operate at LOS C or better during both peak hours. The addition of the proposed interchange does result in

more LOS C operations of the freeway elements between Bromley Lane and Bridge Street due to the increased traffic volumes using the facilities.

Based on the results of the analysis, for intersections along Baseline Road:

- The addition of the I-76 and Bridge Street interchange does not result in the operational degradation of any additional transportation elements compared to the No-Action Alternative. The overall number of transportation elements operating at LOS E/F is less than the 2035 No-Action Alternative.
- The overall magnitude of the delays and queues at all elements will improve.
- The northbound approach of the West Frontage Road will operate at LOS C/E during the AM and PM peak hours, which is an improvement from the LOS E/F operations in the 2035 No-Action Alternative.
- The southbound approach of the West Frontage Road will continue to operate at LOS F in the AM and PM peak hours; however, the queues are expected to decrease when compared to the 2035 No-Action Alternative.
- The northbound approach of the eastbound I-76 off-ramp will operate at LOS F during the PM peak hour; however, the delay and queues are expected to decrease when compared to the 2035 No-Action Alternative.

Based on the results of the analysis, for intersections along Bridge Street:

- A reduction of vehicles traveling to Bromley Lane will result in improved operations at the 50th Avenue and Bridge Street intersection.
- Both the northbound and southbound Prairie Falcon Parkway approaches to Bridge Street will experience an increase in delay. Improving the connection of Bridge Street to I-76 with the proposed new interchange will draw more regional traffic to the segment of Bridge Street between 50th Avenue and I-76. This additional traffic on Bridge Street results in fewer gaps for vehicles to turn from the stop-controlled approaches onto Bridge Street. By 2035, the northbound and southbound approaches at this intersection will operate at LOS E/F in the AM and PM peak hours.

Based on the results of the analysis, for intersections along Bromley Lane:

- The intersection at 50th Avenue and West Frontage Road will improve from LOS F/F to LOS C/B during the AM/PM peak hours when compared to the 2035 No-Action Alternative.
- The West Frontage Road will continue to operate poorly (LOS F/F) in the peak hours, but the magnitude of the poor operations will be reduced, compared to the 2035 No-Action Alternative; delay is expected to decrease.

- The westbound ramp intersection will continue to operate poorly (LOS F/F) in both the AM and PM peak hours, but the magnitude of the poor operations will be reduced, compared to the 2035 No-Action Alternative. Delay and queues are expected to decrease, but queues are expected to spill back onto mainline I-76 during the AM peak hour, which will impact I-76 safety and operations.
- The eastbound ramp intersection will continue to operate poorly (LOS F/F) in both the AM and PM peak hours, but the magnitude of the poor operations will be reduced, compared to the 2035 No-Action Alternative; delay is expected to decrease, but queuing on the ramp will spill back onto mainline I-76, which will impact I-76 safety and operations.
- Queues between the closely spaced intersections along Bromley Lane will continue to create additional operational and safety issues. Operations at the intersections west of I-76 along Bromley Lane are very similar to the 2035 No-Action Alternative.

The following results of the Action Alternatives delay analysis are shown in Exhibit 4.1-9 and are compared to the results from the 2013 Existing Conditions and 2035 No-Action Alternative.

- The addition of the I-76 and Bridge Street interchange will reduce overall delay in the area below the 2035 No-Action Alternative levels, and by as much as 75 percent.
- The majority of the delay will continue to occur at the Bromley Lane interchange.
- As a matter of comparison, delay encountered at the proposed Bridge Street interchange will be similar to that experienced under existing traffic conditions at the Baseline Road interchange.

Exhibit 4.1-9. Comparison of 2013 Existing Conditions, 2035 No-Action Alternative, and 2035 Action Alternatives Interchange Area Delay

Condition	Interchange	Total Delay (vehicle-hours/day)					
		AM			PM		
2013 Existing	Baseline Road	6.4			11.5		
	Bridge Street	1.4			1.9		
	Bromley Lane	20.2			39.8		
	Total	28.0			53.2		
2035 No-Action Alternative	Baseline Road	442.3			486.2		
	Bridge Street	1.8			3.7		
	Bromley Lane	666.1			996.3		
	Total	1,110.2			1,486.2		
2035 Action Alternatives	Baseline Road	180.7			98.0		
	Bridge Street	7.4 ¹	4.8 ²	5.3 ³	10.1 ¹	6.8 ²	7.2 ³
	Bromley Lane	262.7			263.3		
	Total	450.9¹	448.3²	448.8³	371.4¹	368.1²	368.5³

¹Four-roundabout alternative²Three-roundabout alternative³Two-roundabout alternative (Preferred Alternative)

The addition of the I-76 and Bridge Street interchange provides motorists with a choice of routes to complete their trip. Motorists who are currently traveling between the Bromley Lane interchange and the intersection of 50th Avenue and Bridge Street can use Route 1 or Route 2 (see Exhibit 4.1-10). With the proposed interchange, motorists can continue to use these routes or they can instead use Route 3 or Route 4 to reach the same destinations. The new routes are approximately twice as long as the original routes, but half of the distance is on I-76, which will allow traffic to travel at highway speeds.

Exhibit 4.1-10. 2035 Action Alternatives Peak Hour Travel Time Routes

The results of the 2035 Action Alternatives travel time analysis are shown in Exhibit 4.1-11 and described below.

- The travel times for Routes 1 and 2 are reduced compared to the No-Action Alternative, but they are still longer than 2013 travel times.
- Routes 3 and 4 travel times are shorter than the 2035 No-Action Alternative times for Routes 1 and 2 and are similar to 2013 travel times.

- Routes 3 and 4 travel times are similar to Routes 1 and 2 travel times for the existing conditions.
- Motorists have more route choices that will all save time, as much as three minutes, compared to the No-Action Alternative

Exhibit 4.1-11. 2035 Action Alternatives Travel Time Analysis Results

Condition	Travel Time (seconds per vehicle)*							
	Route 1**		Route 2**		Route 3**		Route 4**	
	AM	PM	AM	PM	AM	PM	AM	PM
2013 Existing	224	190	214	207	n/a	n/a	n/a	n/a
2035 No-Action Alternative	376	377	412	423	n/a	n/a	n/a	n/a
2035 Action Alternatives	301	220	245	369	211	218	233	220

*Note: Travel times were calculated for the four-roundabout alternative, which was determined to reflect the worst-case scenario.

**Refer to Exhibit 4.1-10 for a description of the routes.

Other Improvements

The addition of the interchange at Bridge Street does not result in all roadway segments operating at LOS D or better. Thus, some other improvement measures will be required. Adding an interchange at I-76 will result in rerouting traffic to the transportation network segments on and around Bridge Street. As a result, the northbound and southbound approaches to the intersection of Prairie Falcon Parkway will operate at LOS E/F during the peaks. Since the addition of the interchange resulted in this degradation in operations, the proposed project will need to improve this intersection to operate at LOS D or better. The addition of a traffic signal would provide the needed improvements. A traffic signal at this location would be an acceptable measure because the spacing of intersections along Bridge Street would better accommodate a traffic signal. This is the only improvement measure that would be related to the proposed interchange, and will be included as part of the project.

4.1.5. In summary, what are the effects to transportation?

In summary, the 2035 No-Action Alternative will:

- Increase the number of road segments that will operate at LOS E/F
- Increase delays and queues that motorists will experience
- Back traffic up on ramps for I-76, creating safety and operational issues
- Increase travel times between the I-76 and Bromley Lane interchange and the intersection of 50th Avenue and Bridge Street by as much as 200 seconds per vehicle

If the I-76 and Bridge Street interchange is not constructed, the structure at Bromley Lane will need to be rebuilt by the year 2025 to include widening as a means to accommodate additional capacity.

Pedestrian and bicycle operations and safety will be affected by growing congestion as traffic volumes increase along the existing streets, a negative direct impact of the No-Action Alternative.

By 2035, the Action Alternatives will:

- Meet the needs of the project Purpose and Need
- Improve overall connectivity to/from I-76 and Brighton
- Reduce the number of roadway segments operating at LOS E/F compared to the 2035 No-Action Alternative and 2013 existing conditions
- Reduce overall delay and queues at key intersections
- Save motorists as much as three minutes in travel time per vehicle over the No-Action Alternative while completing trips to destinations along Bridge Street and to the west of 50th Avenue
- Require the addition of a traffic signal or other mitigation measure at the Bridge Street and Prairie Falcon Parkway intersection
- Extend the life of the infrastructure at Bromley Lane to at least the year 2030, which is about five years longer than the No-Action Alternative

The Action Alternatives have similar overall impacts, but the Preferred Alternative was chosen because:

- It includes only two roundabouts, instead of the three or four roundabouts included in the other alternatives. This will simplify signage and markings and drivers' choices by consolidating ramp and frontage road access points into a single roundabout on each side of the highway.
- It is a simpler design with easy construction phasing that will create fewer anticipated traffic impacts during construction compared to the other alternatives.
- It accommodates heavy truck turning movements more efficiently than the other alternatives.

4.1.6. What are the mitigation measures?

Mitigation measures are not required since there are no adverse effects to transportation as a part of this project. When construction begins, temporary construction impacts may occur, which will be mitigated with traffic control and detours.

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4.2 Air Quality

In relation to transportation, air quality concerns focus on emissions from vehicles and particulate matter in the air caused by maintenance operations, such as sanding, or construction operations that cause fugitive dust. The study area for air quality is the I-76 and Bridge Street overpass, the frontage roads, and intersections within the project area, as well as any sensitive receptors adjacent to these facilities (see Exhibit 4.2-2).

4.2.1. What is the regulatory environment?

National air quality policies are regulated through the federal Clean Air Act of 1970 (CAA). As required by the CAA, the Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS) for seven criteria air pollutants. These include ozone (O₃), carbon monoxide (CO), particulate matter 10 microns in diameter or smaller (PM₁₀), particulate matter 2.5 microns in diameter or smaller (PM_{2.5}), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead (Pb) (see Exhibit 4.2-1). The NAAQS represent thresholds based on specific adverse health and welfare effects associated with each pollutant. The Colorado Department of Public Health and Environment (CDPHE) has adopted the NAAQS; there are no additional ambient air quality standards specific to Colorado.

Exhibit 4.2-1. National Ambient Air Quality Standards, Criteria Pollutants

Pollutant	Averaging Time	NAAQS*	
		µg/m ³ *	ppm*
Ozone (O ₃)	8-Hour	—	0.075 ¹
Carbon Monoxide (CO)	1-Hour 8-Hour	—	35 9
Sulfur Dioxide (SO ₂)	3-Hour	—	0.5
Nitrogen Dioxide (NO ₂)	Annual	—	0.053
Particulate Matter (PM ₁₀)	24-Hour	150	—
Particulate Matter (PM _{2.5})	24-Hour Annual	35 12	— —
Lead (Pb)	Rolling 3-Month Average	0.15	—

Source: EPA, 2013

¹The 2008 standard

*NAAQS = National Ambient Air Quality Standards; µg/m³ = micrograms per cubic meter; ppm = parts per million

The EPA has delegated authority to the CDPHE to administer many of the requirements of the CAA, including compliance with the NAAQS. Within the CDPHE, the Air Pollution Control Division (APCD) oversees air quality policies. The State Implementation Plan (SIP) establishes emission limits for different categories of vehicles that contribute pollutants, including motor vehicles, to avoid exceedances of the NAAQS. To comply with the SIP,

Metropolitan Planning Organizations (MPOs) are required to demonstrate that transportation plans and programs keep emissions within these limits.

If the level of any pollutant in an area exceeds the NAAQS, then the area is designated by the EPA as a nonattainment area for that pollutant. The geographic boundaries of nonattainment areas are determined by the EPA in consultation with the CDPHE. Nonattainment areas are required to prepare individual implementation plans for attaining the standard for each pollutant. After an area has reached the attainment levels set by the NAAQS, a maintenance plan must be prepared to ensure that the standard will continue to be met. After the maintenance plan is approved by the EPA, the area is re-designated as an attainment/maintenance area.

Construction of a new interchange at I-76 and Bridge Street is included in the conforming Statewide Transportation Improvement Program (STIP), the conforming 2012–2017 DRCOG Transportation Improvement Program (TIP), and the 2035 DRCOG Metro Vision Regional Transportation Plan (MVRTP). It is subject to CDOT oversight and state and federal air quality compliance.

4.2.2. What is the affected environment?

The project is in an attainment/maintenance area for CO and PM₁₀. However, neither was examined in detail because the proposed interchange and the intersection of Bridge Street and Prairie Falcon Parkway are both C or better and the vehicle mix is not expected to change much with the implementation of any alternative. Future truck percentages are expected to remain the same as those measured during existing conditions (Atkins, 2013). Therefore, particulate matter impacts for additional truck traffic are not expected to occur from any alternative.

For each alternative examined in this EA, the amount of mobile source air toxics (MSATs) emitted is proportional to the VMT, assuming that other variables, such as fleet mix, are the same for each alternative. The project is located in relatively rural area, with residential development to the west and industrial land use to the southeast (see Exhibit 4.2-2). All other surrounding land is vacant or agricultural land use.

Ozone is a regional pollutant and is analyzed at the regional level; ozone is addressed in conformity for DRCOG MVRTP and TIP. Overall, the trend shows that this pollutant is decreasing regionally. Further information can be found in Appendix B: *Air Quality Technical Report*.

Exhibit 4.2-2. Project Location Map



4.2.3. What are the impacts to air quality?

There will not be an impact to air quality from implementation of any of the Action Alternatives, or from the No-Action Alternative.

In general, future emissions from vehicles will be minimized through several federal regulations (such as emission standards) and regional controls (such as street sanding regulations). The Denver metropolitan area maintenance plans that are already in place for CO and PM₁₀ will serve to avoid and minimize pollutant emissions from vehicles.

Although transportation projects can impact air quality during both the construction and maintenance/operation phases, air quality is primarily affected by increased traffic volumes and vehicle congestion.

No-Action Alternative

The No-Action Alternative will make no changes to the transportation network in the air quality study area, which means that it would not be consistent with the conditions that have been evaluated and adopted by the DRCOG MVRTP. Not building the interchange will not affect regional air quality conformity.

Due to cleaner vehicles, future daily air pollutant levels for most pollutants are predicted to be lower than current levels, even with more vehicles on the roads and no new interchange at I-76 and Bridge Street. There are no indirect impacts associated with the No-Action Alternative.

Action Alternatives

All of the Action Alternatives would have the same impact to air quality in the air quality study area. The impact discussion below is applicable to all Action Alternatives. A new interchange at I-76 and Bridge Street is included in the 2035 MVRTP and the relevant conformity documents, which demonstrates in the long term that the project conforms to the SIP. No sensitive receptors, residences, or crosswalks would be directly or indirectly impacted as a result of the implementation of any of the Action Alternatives. The project will not have any regional or local air quality impacts from implementation of any of the Action Alternatives.

Carbon Monoxide

The results of the analysis show that, for any of the Action Alternatives, all signalized intersections in the air quality study area, as well as the proposed new signal at Prairie Falcon Parkway, would operate at LOS C or better during both the AM and PM peak-hour traffic in the year 2035. The EPA modeling guidance states that intersections which operate at LOS C or better are not likely to cause a violation of the federal 8-hour average CO standard. Therefore, hot spot modeling is not required and all of the alternatives are considered to meet regional-level air quality conformity requirements.

Additionally, the nearby signalized intersection of Bridge Street and 50th Avenue would operate at LOS C or better during both the AM and PM peak-hour traffic in the year 2035 for any of the Action Alternatives.

Particulate Matter

Total particulate matter levels may increase in the future because of more vehicles, but the preliminary analysis indicates the concentrations would still meet the NAAQS. Additional information can be found in Appendix B: *Air Quality Technical Report*. The qualitative analysis for PM₁₀ showed that a new interchange at I-76 and Bridge Street or the proposed new signal at Prairie Falcon Parkway would not be likely to cause or contribute to violations of the PM₁₀ NAAQS. Therefore, it would not have a major impact on local and regional air quality PM₁₀ emissions. Construction of any Action Alternative will likely cause short-term increase in airborne particulate matter.

MSATs

The VMT estimated for each of the Action Alternatives is slightly higher than that estimated for the No-Action Alternative because the interchange may attract trips from alternate routes nearby. This increase in VMT means MSATs in the air quality study area under any of the three Action Alternatives would be higher than the No-Action Alternative. Traffic volumes at other nearby interchanges could be reduced due to a shift in travel patterns to use the proposed interchange; this would result in a decrease in emissions at those locations.

Because the estimated VMT for each of the three Action Alternatives is nearly the same, varying by less than 2 percent, it is expected that there would be no appreciable difference in overall MSAT emissions among the three Action Alternatives. Additionally, for any of the alternatives, emissions are virtually certain to be lower than current levels in the design year of 2035 as a result of the EPA's national control programs that are projected to reduce annual MSAT emissions by more than 80 percent from 2010 to 2050. Furthermore, under any of the Action Alternatives, overall future MSATs are expected to be lower than today due to implementation of the EPA's vehicle and fuel regulations.

4.2.4. What are the proposed mitigation measures?

Although motor vehicle emissions in the project area may increase, they are not expected to result in an exceedance of the NAAQS. Therefore, no air quality mitigation is required. However, since the construction of the project will require submittal of an Air Pollution Emission Notice and Application for Construction Permit from the APCD, preparation of a Fugitive Dust Control Plan will be required. Adherence to this plan will reduce air pollution resulting from construction activities.

Construction-phase air quality impacts (fugitive road dust and construction vehicle engine exhaust emissions) will be controlled by implementing the applicable BMPs listed below:

- Wetting exposed soils and soil piles for dust suppression
- Covering trucks hauling soil and other fine materials
- Stabilizing and covering stockpile areas
- Re-vegetating exposed areas
- Minimizing off-site tracking of mud and debris by washing construction equipment and temporary stabilization of disturbed areas
- Limiting vehicle speed of construction-related equipment when off road
- Prohibiting unnecessary idling of construction equipment
- Using low-sulfur fuel
- Locating diesel engines and motors as far away as possible from residential areas
- Locating staging areas as far away as possible from residential areas
- Requiring heavy construction equipment to use the cleanest available engines or to be retrofitted with diesel particulate control technology
- Using alternatives for diesel engines and/or diesel fuels (such as: biodiesel, liquefied natural gas, compressed natural gas, fuel cells, or electric engines) when possible
- Installing engine pre-heater devices to eliminate unnecessary idling during winter-time construction
- Prohibiting tampering with equipment to increase horsepower or to defeat the effectiveness of emission control devices
- Requiring construction vehicle engines to be properly tuned and maintained
- Using construction vehicles and equipment with the minimum practical engine size for the intended job

4.3 Traffic Noise

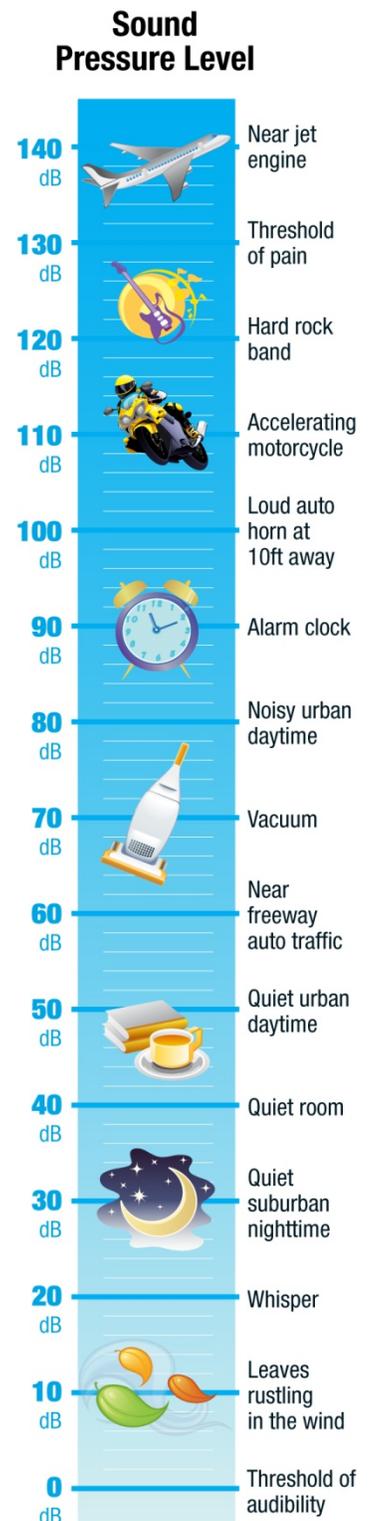
Noise generally is defined as unwanted or undesirable sound. Noise typically affects humans in three different ways: noise intensity or level, noise frequency, and noise variation with time. Proposed alterations to the highway system, including the construction of a new interchange, require an assessment of project impacts on noise intensity due to traffic. The study area for traffic noise is 500 feet from the proposed edge of roadway and any other associated improvements, and is shown in Exhibit 4.3-1.

Noise intensity, or loudness, is determined by how sound pressure fluctuates and is expressed in decibels (dB). The range of noise normally encountered can be expressed by values between 0 and 120 dB on the dB scale. A 3-dB change in sound level generally represents a barely noticeable change, whereas a 10-dB change typically would be perceived as a doubling of loudness.

The frequency of noise is related to the tone or pitch of the sound and is expressed in terms of cycles per second or Hertz. The human ear can detect a wide range of frequencies, from approximately 20 Hertz to 17,000 Hertz.

Because human sensitivity to sound varies from person to person, the A-weighting system is commonly used when measuring noise to provide a value that represents human response. Noise levels measured using this system are called A-weighted levels, and are expressed as dBA.

Because noise fluctuates during the course of a day, it is common practice to condense all of this information into a single number, known as an equivalent sound level (Leq). Leq represents an average sound level over a specified time period (typically 60 minutes), and the value then reflects the hourly equivalent sound level, or Leq(h).



4.3.1. What is the regulatory environment?

The following laws, regulations, and guidance are applicable to the analysis of traffic noise in this EA:

- National Environmental Policy Act of 1969
- Procedures for Abatement of Highway Traffic Noise and Construction Noise, Title 23 CFR §772
- FHWA's *Measurement of Highway-Related Noise* (1996)
- CDOT's *Noise Analysis and Abatement Guidelines* (2013)

4.3.2. What is the affected environment?

The noise study area (see Exhibit 4.3-1) is comprised of land uses typically found in suburban areas, including residential and commercial uses to the west of I-76 and industrial land uses to the east of I-76. Several residential neighborhoods are established west of I-76 along Bridge Street. Future development is expected as new residential units are planned to the west of I-76, including the Brighton Crossing master-planned community. At full build-out, the community will have more than 3,000 homes, townhomes, condominiums, and apartments.

Exhibit 4.3-1. Noise Study Area



Noise-sensitive sites are defined as any location where traffic noise may be adverse to the function and outdoor enjoyment of a property. CDOT and FHWA have established noise thresholds at which noise abatement must be considered for various types of noise-sensitive sites. These noise levels are referred to as the Noise Abatement Criteria (NAC). As presented in Exhibit 4.3-2, NAC vary according to the land use activity category. A traffic noise impact can occur under either of the following two separate criteria:

- Predicted traffic noise levels meet or exceed the NAC
- A substantial noise increase of 10 dBA over existing conditions is predicted

To adequately assess the noise impact of a proposed project, both criteria must be analyzed. If impacts are identified, noise abatement measures must be considered and implemented if they are determined to be both feasible and reasonable.

The study area is comprised mainly of NAC B (residential) areas. The NAC B receptors occur on the west side of I-76. There is an industrial building that is located east of I-76 and south of Bridge Street, which is an NAC F activity category. It was not included in the model because it has no impact criteria, as shown in Exhibit 4.3-2.

Exhibit 4.3-2. CDOT Noise Abatement Criteria

Activity Category	Activity $L_{eq}(h)$ (dBA)	Description of Land Use Activity Category
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	51 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	N/A	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing.
G	N/A	Undeveloped lands that are not permitted for development.

Source: CDOT, 2013

The existing conditions noise analysis was performed in accordance with the requirements of 23 CFR §772, “Procedures for Abatement of Highway Traffic Noise and Construction Noise,” using methodology established by CDOT’s *Noise Analysis and Abatement Guidelines*. Predicted noise levels were produced using the FHWA Traffic Noise Model (TNM), version 2.5.

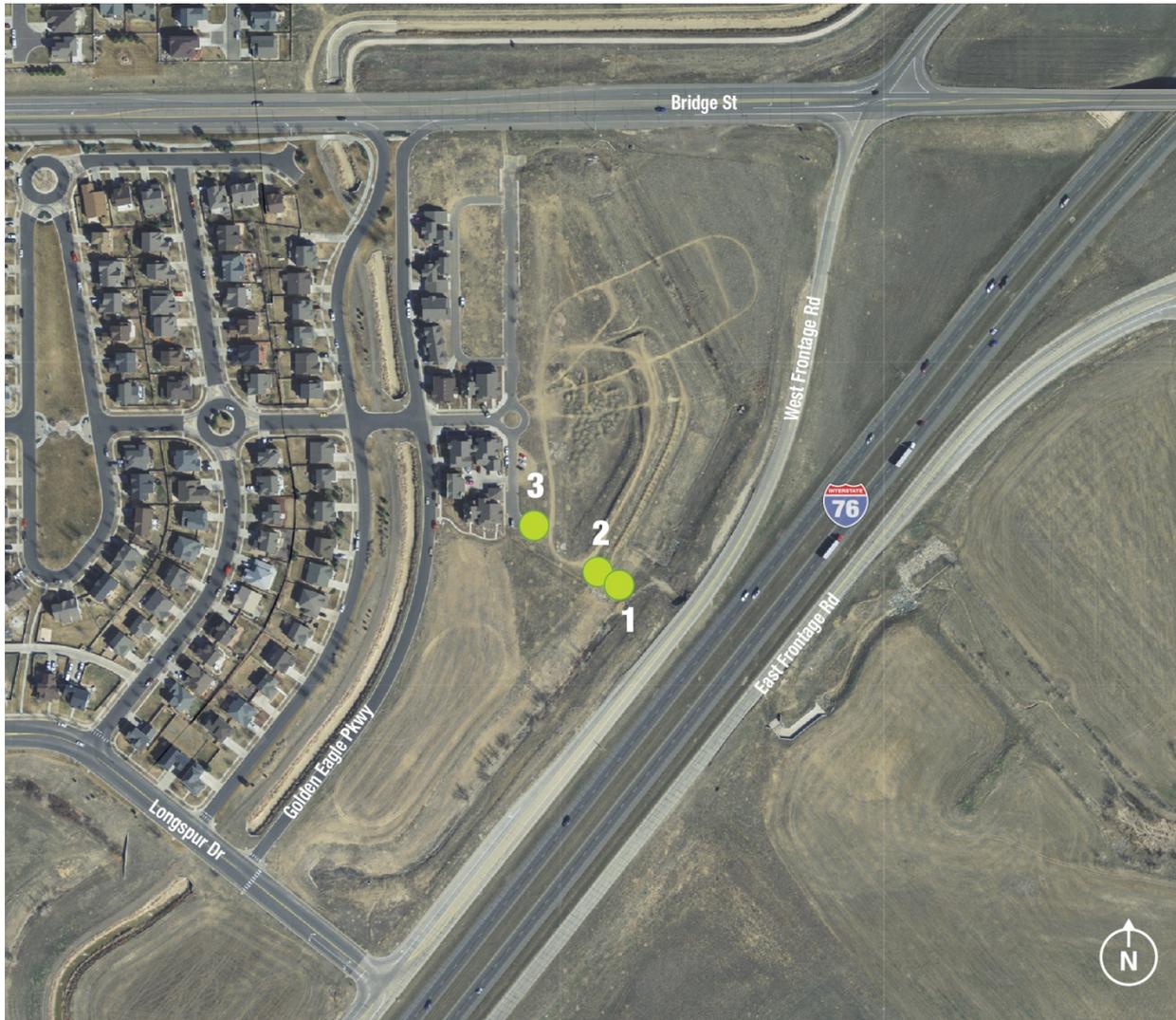
All measured and predicted noise levels are expressed in dBA using A-weighting. The hourly equivalent noise levels are defined as the equivalent average sound level that, in a given hourly period, contains the same acoustic energy as the time-varying sound for the same hourly period.

Noise from traffic emanates from four primary sources: the tire/road interface, engines, aerodynamics, and exhaust stacks. Each of these is considered in the TNM 2.5 model. The dBA-weighted numbers are used to determine the effect upon potential noise-sensitive sites.

To validate the computer noise model, field measurements were taken within the study area following procedures documented in FHWA’s *Highway Traffic Noise: Analysis and Abatement Guidance*. Exhibit 4.3-3 shows the noise-monitoring locations for validating the computer noise model. Data collection efforts focused on exterior locations at noise-sensitive dwelling units within the NAC B land uses. Within the study area, there are two neighborhoods that have NAC B land use. One neighborhood, called Bromley Park, is located west of I-76 and south of Bridge Street, extending to 50th Avenue. The second neighborhood, called Brighton Crossing, is located west of I-76 and north of Bridge Street, extending to 50th Avenue.

Field validation measurements were conducted in the vicinity of noise-sensitive sites, where safe access to monitoring sites existed, where a representative sampling of free-flow traffic could be obtained, and where roadway geometry remained relatively constant. Data collection occurred mid-afternoon when drivers on I-76 were driving at or near free-flow speeds. The CDOT *Noise Analysis and Abatement Guidelines* state that field measurements can be taken at any time; however, it is best to measure when traffic is relatively free-flowing at or near the posted speed limit. Directional counts of all automobile, medium truck, and heavy truck traffic were taken for both directions of I-76 and both the east and west frontage roads.

Validation occurs when measured noise levels are within 3 dBA of the modeled value. Exhibit 4.3-4 summarizes the model validation counts and the additional noise readings collected within the study area.

Exhibit 4.3-3. Noise-Monitoring Locations**Exhibit 4.3-4. Study Area Model Validation Counts and Noise Readings at Noise-Monitoring Locations**

Locations	Distance from Edge of Pavement (feet)	Field Reading (dBA)	Model Result (dBA)	Difference (dBA)
1	115	65.4	64.7	0.7
2	164	64.9	67.8	-2.9
3	350	62.6	62.1	0.5

Based on CDOT's *Noise Analysis and Abatement Guidelines*, 66 dBA was used as the threshold noise level in the analysis of the existing conditions in the study area for the NAC B activity category (see Exhibit 4.3-2). Noise studies typically use the loudest noise

conditions in determining the noise levels. The loudest or worst noise hour is the hour with the highest volume of traffic traveling at the fastest, congestion-free speeds. The existing noise conditions range from 45 dBA to 62 dBA.

Worst-case conditions on the I-76 mainline and all other roadway segments included in the model were determined to occur during the PM peak period, and those volumes were used in the noise model.

4.3.3. What are the impacts to noise?

Traffic-generated noise levels for the Action Alternatives were calculated using TNM 2.5 for the 2035 horizon year. Model inputs included the proposed roadway alignments, traffic volumes, vehicle speed, and truck percentages. To closely model the undulating terrain in the study area, topographic information based on one-foot contours was added to the model. Building rows were added to the model to represent the rows of houses along Bridge Street and on either side of Prairie Falcon Parkway.

Results of the noise models are discussed in upcoming subsections. In general, the 2035 $L_{eq}(h)$ values for the receptors within the study area are expected to range from 49 dBA to 65 dBA for the Action Alternatives, with an average of 54.8 dBA. Based on the results of the model, noise impacts are not expected to occur at any receptor for the Action Alternatives. To see detailed results of the analysis, review Appendix C, *Traffic Noise Technical Report*.

All receptors with the NAC B activity category within 500 feet of the highway edge of pavement (existing or proposed) were included in the model. A signal is proposed at the intersection of Bridge Street and Prairie Falcon Parkway as part of the project, so all receptors with the NAC B activity category within 500 feet of the edge of pavement (existing or proposed) also were included in the model. Areas of future planned development were identified on the west side of I-76, both north and south of Bridge Street. However, no building permits have been issued for any of those parcels, so they were not included in this noise study. All of the residential receivers that were included in the noise models are shown in Exhibit 4.3-5. Detailed information for the residential receivers, with the corresponding receiver numbers, is shown in Exhibit 4.3-6.

Exhibit 4.3-5. Noise Receivers Included in TNM

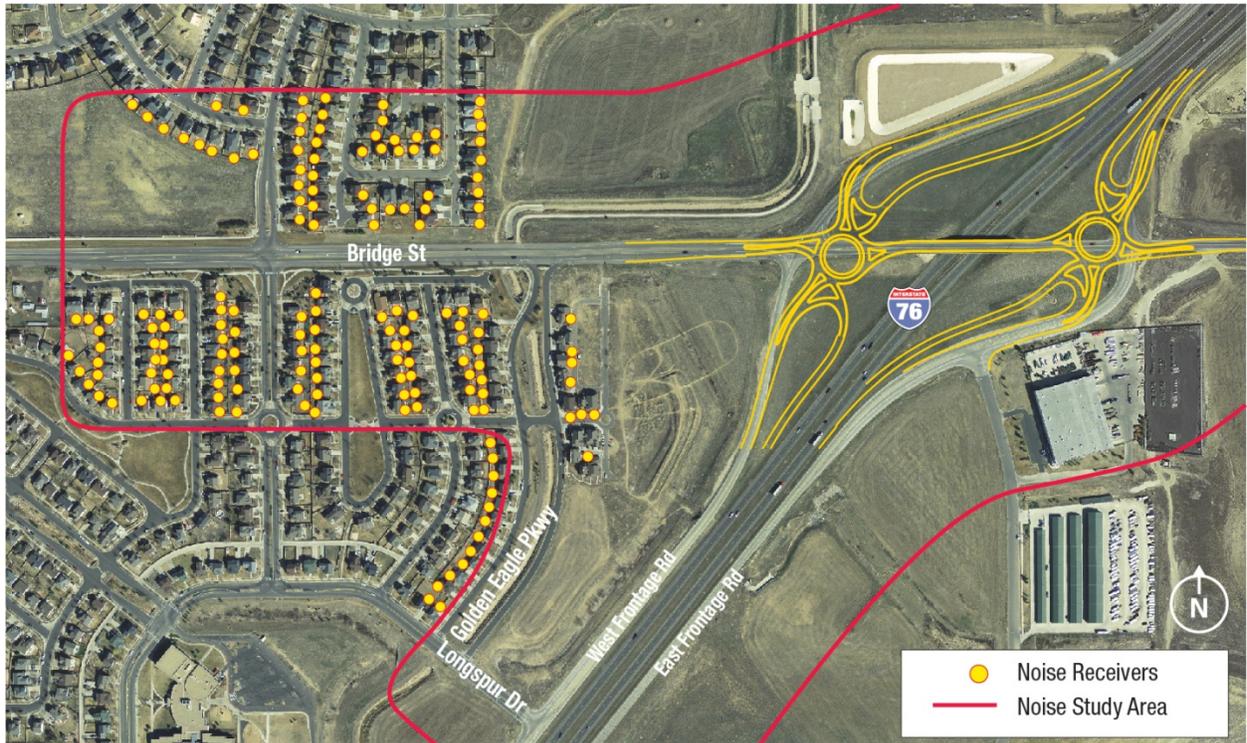
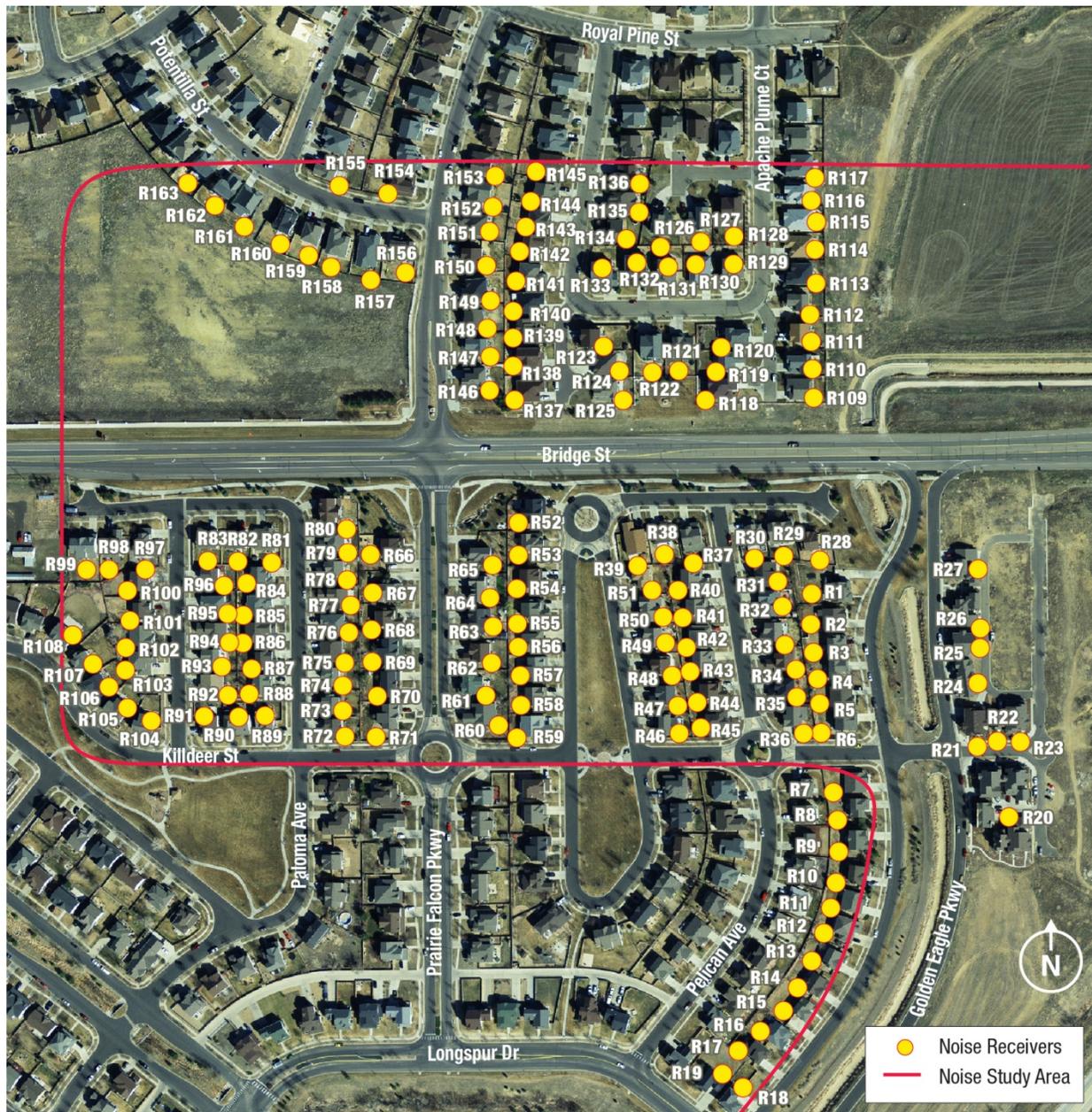


Exhibit 4.3-6. Detailed Noise Receiver Information



No-Action Alternative

The only change between the existing conditions and the No-Action Alternative noise models is the amount of traffic. By 2035, the increase in traffic on the existing road network will cause an increase in traffic noise for all dwelling units, but by no more than 4 dBA. Noise levels for the No-Action Alternative range between 47 dBA and 64 dBA. Since no receptors will experience an increase in noise greater than 10 dBA or a noise level greater than the NAC threshold, there are no noise impacts under the No-Action Alternative.

Action Alternatives

The Action Alternatives will draw more traffic to Bridge Street. The increase in volume will create higher noise levels in the neighborhoods surrounding the Bridge Street and Prairie Falcon Parkway intersection, which is reflected in the model results. The frontage road adjacent to this neighborhood is projected to carry about half the volume in all Action Alternatives as compared to the No-Action Alternative. While the amount of traffic using the freeway facilities will be similar in this and all other Action Alternatives, approximately 100 vehicles in each direction will use the ramps instead of the mainline. These 200 cars will travel at a lower speed when using the ramps, resulting in less noise.

The noise levels in Action Alternatives range between 49 dBA and 65 dBA. No receptor experiences more than a 5-dBA increase in noise compared to existing conditions. Since no receptor will experience noise levels above the NAC threshold or experience a substantial increase in noise, there will be no traffic noise impacts for Action Alternatives.

The results for the Existing, 2035 No-Action Alternative, and 2035 Action Alternatives are summarized in Exhibit 4.3-7. Detailed results of the noise analysis can be found in Appendix C, *Traffic Noise Technical Report*.

Exhibit 4.3-7. Noise Analysis Results Summary

Alternative	Predicted Noise Range $L_{eq}(h)$ (dBA)		Total Number of Dwelling Units in the Study Area	Number of Dwelling Units that Exceed NAC Threshold	Number of Dwelling Units with a Substantial Noise Increase > 10 dBA
	Min	Max			
Existing	45	62	182	0	N/A
2035 No-Action Alternative	47	64	182	0	0
2035 Action Alternatives	49	65	182	0	0

Construction Noise

Construction noise will present the potential for short-term impacts to those receptors located along the corridor and along designated construction access routes. However, these impacts are difficult to predict. It is anticipated that a portion of the construction will occur at night to minimize traffic disruption. The primary source of construction noise is expected to be diesel-powered equipment—such as trucks and earth-moving equipment—and construction activities—such as demolition hammers on trackhoes, rubble load outs, and tailgate and bucket bang.

Construction noise at off-site receptor locations usually will be dependent on the loudest one or two pieces of equipment operating at the moment. Noise levels from diesel-powered equipment range from 80 dBA to 95 dBA at a distance of 50 feet. Noise impacts are

expected to occur during the day and night, but only in isolated areas along the project corridor.

At Bridge Street, Brighton limits end approximately one-half mile east of I-76, so all the residential units in the study area are within Brighton boundaries. This project will abide by all appropriate city codes as they pertain to construction noise. If noise levels during construction are expected to exceed the limits from the city code, the contractor must obtain the necessary ordinance variance.

4.3.4. What are the proposed mitigation measures?

The following recommendations for mitigation measures are proposed. Since there are only temporary noise impacts with construction of the Action Alternatives, no permanent noise mitigation is recommended. However, prior to construction, all relevant permissions will be acquired. Each construction contractor shall submit a work plan outlining work schedules and intended mitigation measures prior to initiating construction.

The following BMPs will be recommended for the contractor, as applicable:

- Use noise blankets on equipment and quiet-use generators
- Minimize construction duration in residential areas as much as possible
- Minimize night-time activities in residential areas as much as possible
- Re-route truck traffic away from residential streets where possible
- Combine noisy operations to occur in the same time period

Potential BMPs for consideration include:

- Eliminate slamming of truck beds, truck tailgates, and equipment buckets
- Idle down equipment engines when the equipment is not in use
- Maintain all equipment to meet manufacturer's specifications
- Schedule trucks properly to minimize long queues
- Minimize back-up distances for trucks and other equipment
- Install localized noise shielding around compressors and other equipment when in close proximity to residences.

Contractors also will consider maintaining contact with the public through a 24-hour telephone line for questions and concerns and to provide schedules of planned construction activities.

For more information on construction noise issues, see FHWA's *Highway Construction Noise Handbook* (2006).

Local Agency Coordination

Local government officials can promote compatibility between land development and highways by ensuring that NAC B, C, and E type development is restricted or limited within the projected areas impacted by traffic noise. Noise contours will be provided to local officials as part of this project. These contours can be used to establish compatible development of currently undeveloped parcels or compatible redevelopment in areas where land use changes. NAC E sites should use this information to situate outdoor-use areas associated with office buildings and commercial centers away from the roadway.

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4.4 Land Use and Zoning

Transportation projects are generally a response to the way surrounding land is used and managed. It is important to consider the compatibility of a proposed project with surrounding land uses and management policies (both future and present). The study area for land use and zoning is comprised of the parcels immediately adjacent to the construction envelope.

4.4.1. What is the regulatory environment?

Laws, regulations, and guidance applicable to land use include federal transportation acts; Section 1010 of the Urban Park and Recreation Recovery Act of 1978. Brighton has a 2020 Comprehensive Plan, which governs land use and zoning along with its Land Use and Development Code.

4.4.2. What is the affected environment?

The following local and regional planning documents were reviewed and supplemented with a site visit and zoning maps:

- Brighton 2020 Comprehensive Plan (City of Brighton, 2009)
- Adams County Comprehensive Plan (Adams County, 2012)
- DRCOG 2035 MVRTP (DRCOG, 2011)

Brighton's local municipal plan also was supplemented with information from the DRCOG 2035 MVRTP and Adams County's Comprehensive Plan to conceptualize future land use (DRCOG, 2011; Adams County, 2012). The 2035 MVRTP is a long-range plan for the growth and development of the Denver metropolitan area and is updated every five years. The Adams County Comprehensive Plan was established in 2004 and provides goals, policies, and a future land use plan for the County (Adams County, 2012).

The land use and zoning study area is located within the DRCOG Metro Vision 2035 Urban Growth Area. The DRCOG Urban Growth Area defines where urban development will take place in the region over the next 25 years, and it is estimated that at least a 10 percent increase in overall density between 2000 and 2035 will occur in the Urban Growth Area (DRCOG, 2011). The Adams County Comprehensive Plan maps the I-76 and Bridge Street intersection study area as "Municipal Area" (Adams County, 2012). Future land uses in these areas are governed by the municipalities, in coordination with the County. Therefore, future land use would follow the above-mentioned City of Brighton Comprehensive Plan and DRCOG 2035 MVRTP.

Current Land Use and Zoning

The project is located in a historically rural area to the northeast of the City and County of Denver in Brighton, Adams County, Colorado, which is experiencing suburban development. It is located within the DRCOG metropolitan region.

Current zoning in the land use and zoning study area is commercial, agricultural, industrial, residential, state-owned, or park/open space designations. Current land uses in the land use and zoning study area generally are compatible with zoning (Exhibit 4.4-1). There is a Charter School (Bromley East Charter School) and a park (Dewey Strong Park) to the south that is outside the land use and zoning study area and will not be impacted.

Brighton zoning designations show the area surrounding the project to be Planned Unit Development (PUD) (City of Brighton, 2014). According to the City of Brighton Land Use Code, PUD is a project that treats a planned developed with multiple residential units as one entity.

To the west of the land use and zoning study area there are several current or planned residential communities. These include Bromley Park (south of Bridge Street, west of I-76), Brighton East Farms (north of Bridge Street, west of I-76), and Brighton Crossing (just west of Brighton East Farms) (Exhibit 4.4-1). The Brighton Crossing master planned community to the west is expected to have more than 3,000 homes, townhomes, condominiums, and apartments at full build out.

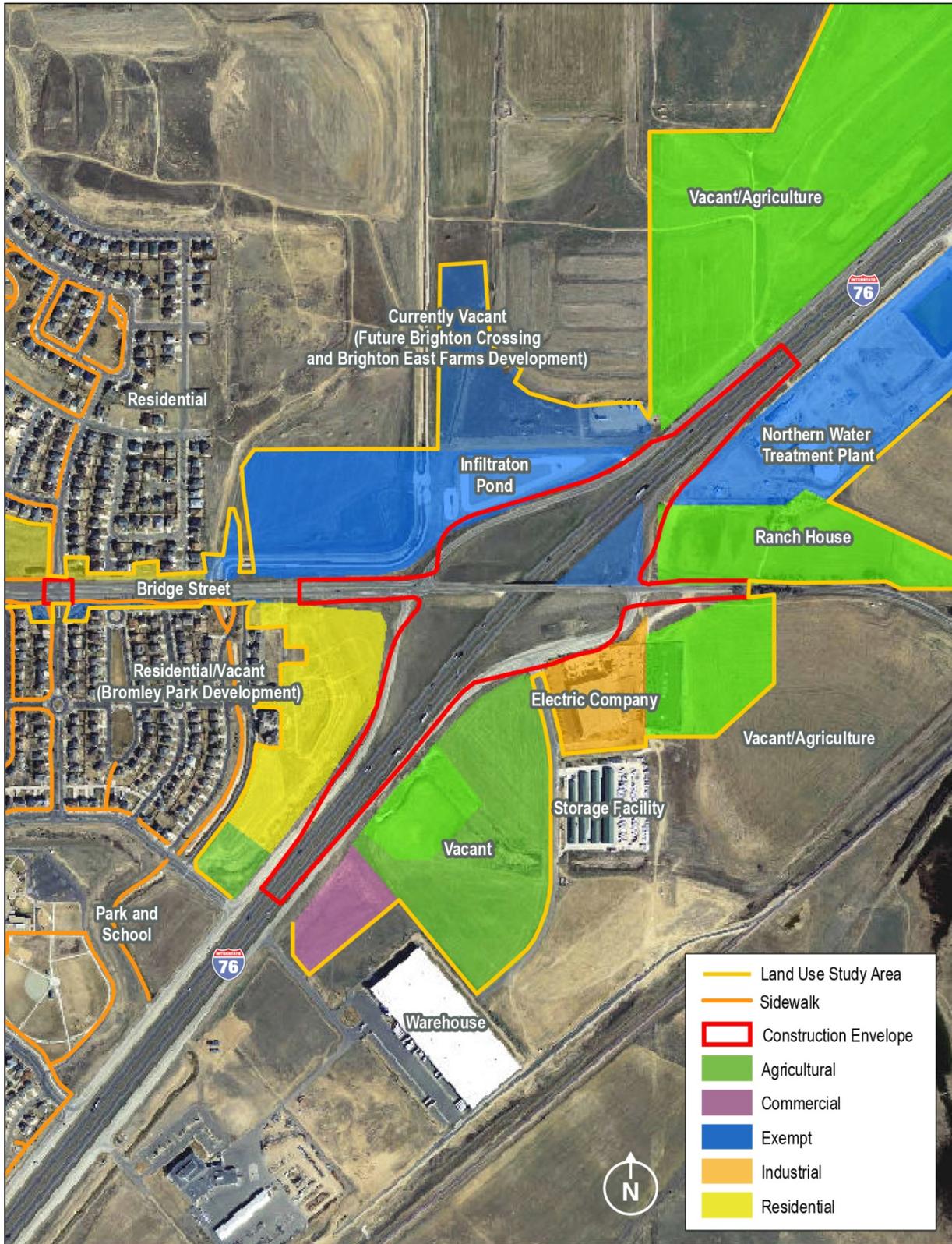
East and south of the land use and zoning study area there are agricultural properties as well as some light industrial/commercial development, including offices, a water treatment plant, and a storage facility (Exhibit 4.4-1).

Future Land Use and Zoning

The City of Brighton's 2020 Comprehensive Plan designates nine future land use types in the proximity of land use and zoning study area (Exhibit 4.4-2). These include:

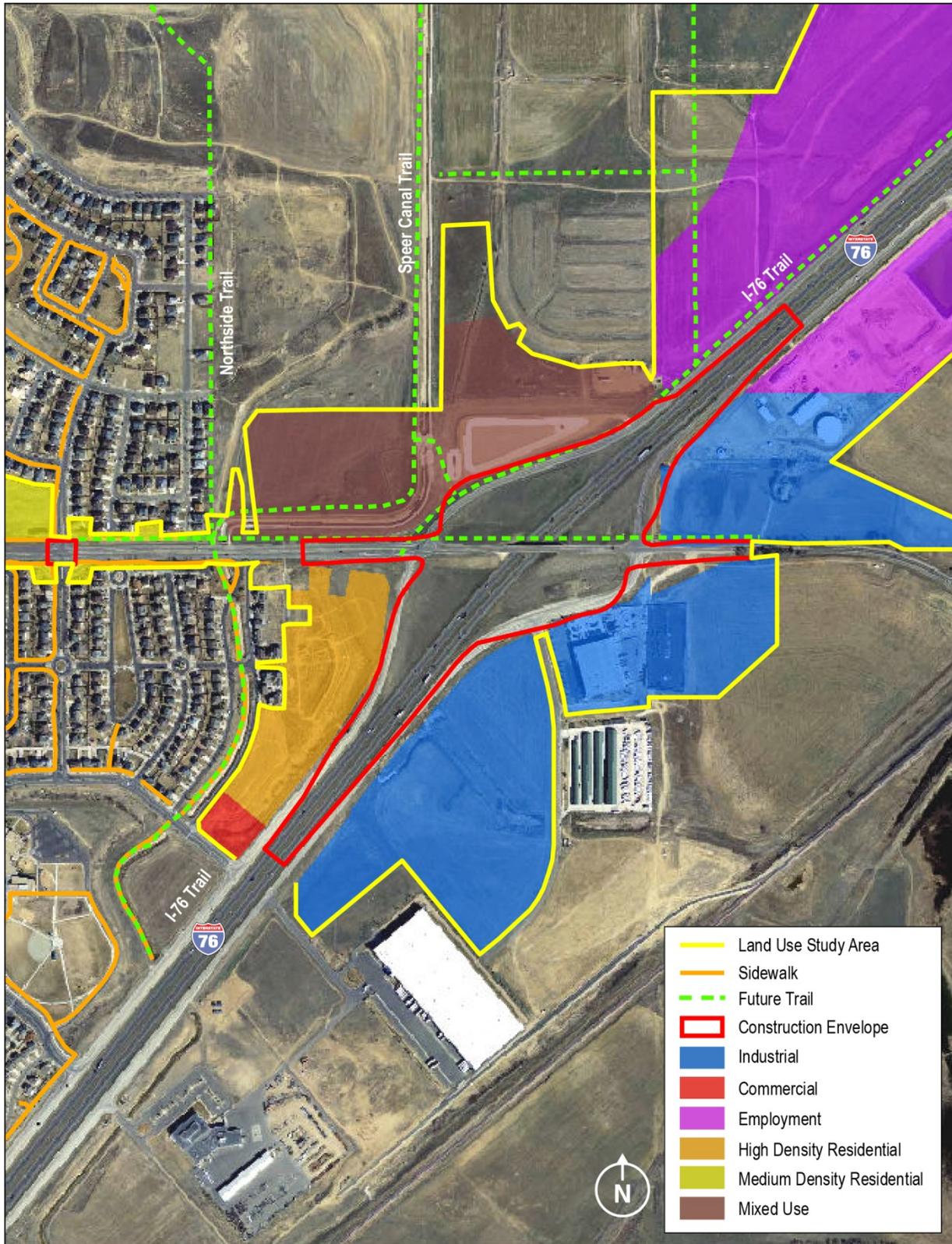
- **Agricultural:** Area that has an emphasis on protecting and preserving agricultural and farming culture
- **High-Density Residential:** Area with a density of five or more residences per acre
- **Mixed Use (residential, commercial, and office):** Areas that have different uses that are compatible with each other
- **Parks and Open Space:** Areas open to the public for recreational or conservation purposes

Exhibit 4.4-1. Existing Land Use and Zoning in Study Area



Source: Adams County, 2012

Exhibit 4.4-2. Future Land Use and Zoning in Study Area



Source: Adams County, 2012

- **Medium-Density Residential:** Area with a density between two and a half and five residences per acre
- **Commercial:** Areas with retail, service, and office uses
- **Public Lands:** Areas that are owned, operated, or dedicated to use by government, non-profit, or quasi-public entities
- **Employment:** Areas with primarily office and/or light industrial uses
- **Industrial:** Areas that are manufacturing, assembling, and warehouse uses, as well as research, design, and office uses.

4.4.3. What are the impacts to land use and zoning?

Land use and zoning impacts were evaluated based on the conversion of non-transportation right of way to a transportation use.

No-Action Alternative

Planned development is still expected to occur and will generate additional travel demand and access needs in the project area. The No-Action Alternative is not compatible with future land use plans, since it does not support the growth, projected travel demand, and access needs of the future. No land uses will be converted to transportation facility under the No-Action Alternative.

The current zoning in the land use and zoning study area is not in conflict with the No-Action Alternative. No direct impacts or major concerns regarding zoning were identified. The No-Action Alternative could have the indirect effect of slowing planned development by reducing the attractiveness of the area due to lack of direct access to I-76 and congestion on the route to access I-76.

Action Alternatives

All of the Action Alternatives will have the same impacts to land use and zoning. They all are compatible with existing and future land use plans in the land use and zoning study area and support the goals and objectives of adopted local land use plans. Traffic demand in the land use and zoning study area is anticipated to increase in the future due to planned development, resulting in the need to provide workers, residents, and visitors better access to the interstate. Local and regional land use plans are in place to help guide this increase in activity.

All of the three Action Alternatives, which include the construction of an interchange as well as installation of a new traffic signal at Prairie Falcon, will improve mobility in the land use and zoning study area and allow for better access to and from I-76 for future PUD, as well as current commercial, industrial, and residential properties. Small amounts of

agricultural, industrial, and state exempt/owned properties will be converted to a transportation use under the Action Alternatives due to the construction of the interchange. There are no land use or zoning impacts associated with the new traffic signal. Construction will not impact the existing land uses and is not expected to directly affect access to any parcels. In addition, the current zoning is not in conflict with the Action Alternatives.

All Action Alternatives could have the indirect effect of hastening planned development by improving the attractiveness of the area with the addition of direct access to I-76. They all would provide better access to and from planned future development off of I-76, thus helping to relieve existing and projected traffic pressure at the existing intersection area.

4.4.4. What are the proposed mitigation measures?

No land use or zoning mitigation is required.

4.5 Right of Way, Relocations, and Acquisitions

Right of way is land that is assigned a use for a transportation purpose. For example, right of way can be used for roads, bridges, and transit facilities, as well as associated supporting features, such as roadside ditches, clear zones, and bus stops. In operating and maintaining the transportation system, agencies sometimes need to acquire land and convert its use to transportation. In some cases, acquisition of land for this purpose requires relocation of homes, businesses, or other types of land uses. The study area for right of way, relocations, and acquisitions includes the parcels that are in or immediately adjacent to the construction envelope.

4.5.1. What is the regulatory environment?

All acquisition of property must adhere to the applicable Colorado state and federal laws and regulations regarding acquisition and relocation. For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, (Uniform Act). The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from federal or federally assisted programs or projects. It was created to provide for and ensure the fair and equitable treatment of all such persons. To further ensure that the provisions contained within this act are applied “uniformly”, CDOT requires Uniform Act compliance on any project for which it has oversight responsibility, regardless of the funding source. Additionally, the Fifth Amendment of the United States Constitution provides that private property may not be taken for a public use without payment of “just compensation.” All impacted owners will be provided notification of the acquiring agency’s intent to acquire an interest in their property, including a written offer letter of just compensation specifically describing those property interests. A Right-of-Way Specialist will be assigned to each property owner to assist them with this process.

In certain situations, it may also be necessary to acquire improvements that are located within a proposed acquisition parcel. In those instances where the improvements are occupied, it becomes necessary to “relocate” those individuals from the subject property (residential or business) to a replacement site. The Uniform Act provides for numerous benefits to these individuals to assist them both financially and with advisory services related to relocating their residence or business operation. Although the benefits available under the Uniform Act are far too numerous and complex to discuss in detail in this document, they are available to both owner occupants and tenants of either residential or business properties. In some situations, only personal property must be moved from the real property and this is also covered under the relocation program. As soon as feasible, any person scheduled to be displaced will be furnished with a general written description of the displacing agency's relocation program, which provides, at a minimum, detailed information related to eligibility requirements, advisory services and assistance, payments,

and the appeal process. It will also provide notification that the displaced person(s) will not be required to move without at least 90 days' advance written notice. For residential relocatees, this notice cannot be provided until a written offer to acquire the subject property has been presented, and at least one comparable replacement dwelling has been made available. Relocation benefits will be provided to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits under the act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail by an assigned Right-of-Way Specialist.

4.5.2. What is the affected environment?

The project is located mostly within existing I-76 and Bridge Street right of way, which is owned by CDOT and Brighton, respectively. However, in areas, the construction envelope of all three Action Alternatives extends farther out, so the right of way study area includes parcels outside the transportation right of way. Property ownerships of the right of way were determined using parcel data obtained from Adams County (2013).

Existing Right-of-Way Ownership

As mentioned above, the majority of the right of way study area lies within designated transportation right of way. The areas immediately adjacent to the existing Bridge Street overpass over I-76 that fall outside of the current transportation right of way generally are undeveloped and zoned as agricultural, residential, industrial, or state-exempt properties. The state-exempt properties are owned by CDOT, United Water and Sanitation District, East Cherry Creek Valley Water District, and the South Beebe Draw Metropolitan District. Based on current data, there are 18 parcels owned by 11 entities located within the right of way study area (see Exhibit 4.5-1). Areas adjacent to the Prairie Falcon Parkway and Bridge Street intersection are residential.

4.5.3. What are the impacts to right of way, relocations, and acquisitions?

Right of way required for the project was identified by overlaying the footprints of the Action Alternatives on parcel ownership maps.

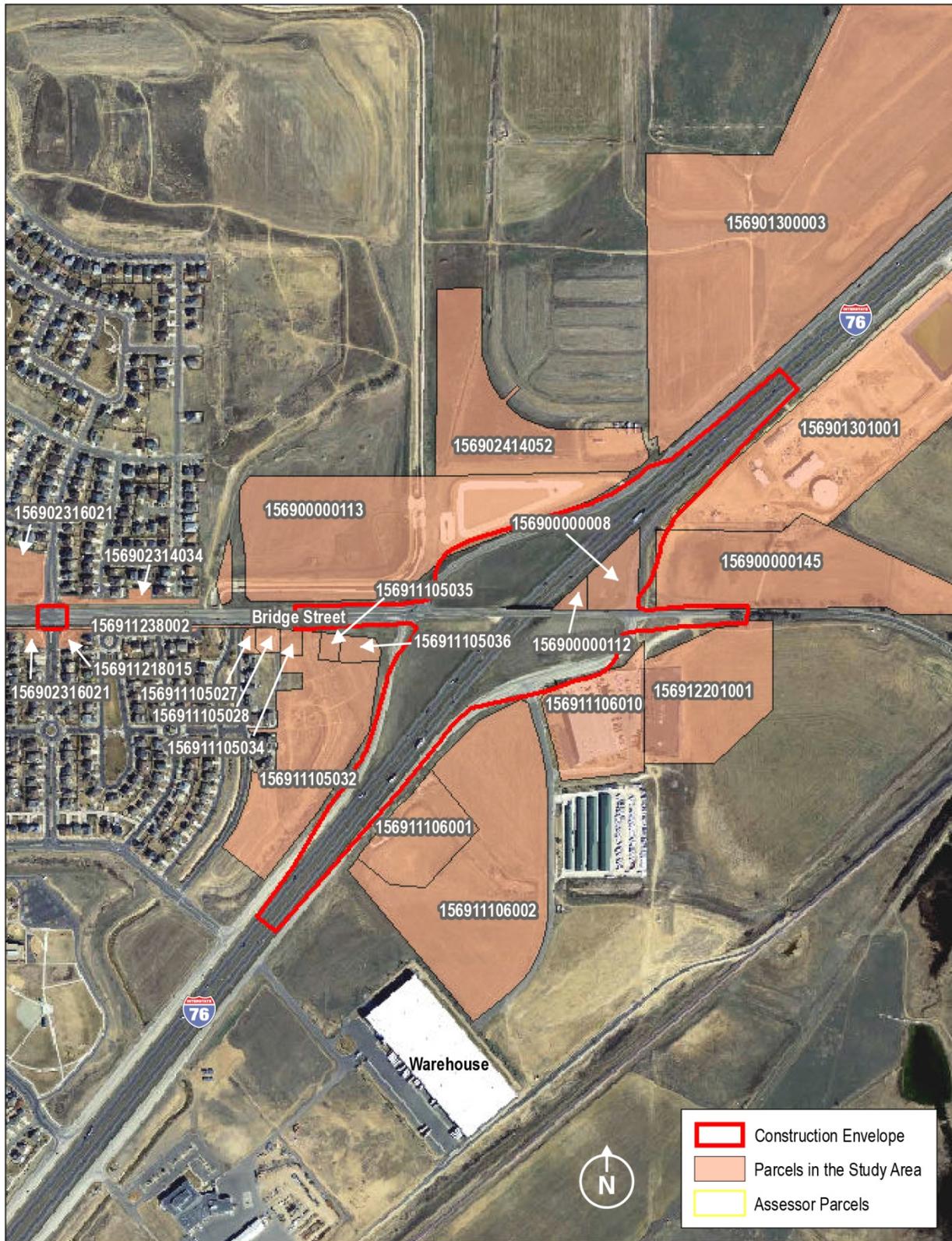
No-Action Alternative

There will be no direct or indirect impacts to right of way under the No-Action Alternative.

Action Alternatives

There will be direct temporary and permanent impacts to right of way from all three Action Alternatives. "Permanent impacts" to right of way means acquisition of the property, whereas "temporary impacts" means the area will be impacted only during construction. Exhibit 4.5-2 summarizes the right-of-way impacts by Action Alternative only for those impacted parcels. Of the three Action Alternatives, Alternative 2 will have the greatest amount of permanent impacts: 20,174 square feet (0.5 acre). The Preferred Alternative will have permanent impacts of 10,457 square feet (0.2 acre), and Alternative 3 will have the

Exhibit 4.5-1. Parcels within the Right of Way Study Area



least amount of permanent impacts to right of way with 4,718 square feet (0.1 acre). All Action Alternatives will require partial acquisitions of parcels without impacts to any structures, and include the same three parcels: one agricultural property, one industrial property, and one state-exempt property. No full property acquisitions or relocations will be required under any of the three Action Alternatives (parcels 156900000112 and 156900000008, which are within the construction envelope, are owned by CDOT). Temporary construction impacts will be similar between all three Action Alternatives: between 5,159 and 5,570 square feet (0.118 acre to 0.127 acre) (see Exhibit 4.5-3). All right-of-way impacts are due to the construction of the interchange, not the new signal at the Prairie Falcon Parkway and Bridge Street intersection.

Exhibit 4.5-2. Permanent Right-of-Way Impacts to Parcels

Parcel Number	Owner	Zoning	Permanent Impact (square feet)		
			Preferred Alternative	Alternative 2	Alternative 3
156901301001	East Cherry Creek Valley Water	Exempt	0	0	0
156900000145	Newton Catherine A and Bishop Norah C	Agricultural	991	155	155
156900000113	United Water and Sanitation District	Exempt	7,914	16,214	1,019
156911106010	Western United Electric	Industrial	1,552	3,805	3,544
Total Impacts (square feet)			10,457	20,174	4,718
Total Impacts (acres)			0.240	0.463	0.108

Source: Adams County, 2013

Notes: The number of impacted properties and the resultant impacted areas estimated above are preliminary and subject to change, upon completion of more advanced design.

Exhibit 4.5-3. Temporary Right-of-Way Impacts to Parcels

Parcel Number	Owner	Zoning	Temporary Impact (square feet)		
			Preferred Alternative	Alternative 2	Alternative 3
156901301001	East Cherry Creek Valley Water	Exempt	53	54	54
156900000145	Newton Catherine A and Bishop Norah C	Agricultural	766	378	380
156900000113	United Water and Sanitation District	Exempt	2,765	2,867	2,763
156911106010	Western United Electric	Industrial	1,575	2,271	2,236
Total Impacts (square feet)			5,159	5,570	5,433
Total Impacts (acres)			0.118	0.127	0.124

Source: Adams County, 2013

Notes: The number of impacted properties and the resultant impacted areas estimated above are preliminary and subject to change, upon completion of more advanced design.

4.5.4. What are the proposed mitigation measures?

For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests will comply fully with the Uniform Act. The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from federal or federally assisted programs or projects. It was created to provide for and ensure the fair and equitable treatment of all such persons. To further ensure that the provisions contained within this act are applied “uniformly,” CDOT requires Uniform Act compliance on any project for which it has oversight responsibility, regardless of the funding source. Additionally, the Fifth Amendment of the United States Constitution provides that private property may not be taken for a public use without payment of “just compensation.” All impacted owners will be provided notification of the acquiring agency's intent to acquire an interest in their property, including a written offer letter of just compensation specifically describing those property interests. A Right-of-Way Specialist will be assigned to each property owner to assist them with this process.

In certain situations, it may also be necessary to acquire improvements that are located within a proposed acquisition parcel. In those instances where the improvements are occupied, it becomes necessary to “relocate” those individuals from the subject property (residential or business) to a replacement site. The Uniform Act provides for numerous benefits to these individuals to assist them both financially and with advisory services related to relocating their residence or business operation. Although the benefits available under the Uniform Act are far too numerous and complex to discuss in detail in this document, they are available to both owner occupants and tenants of either residential or business properties. In some situations, only personal property must be moved from the real property and this is also covered under the relocation program. As soon as feasible, any person scheduled to be displaced will be furnished with a general written description of the displacing agency's relocation program, which provides, at a minimum, detailed information related to eligibility requirements, advisory services and assistance, payments, and the appeal process. It will also provide notification that the displaced person(s) will not be required to move without at least 90 days' advance written notice. For residential relocatees, this notice cannot be provided until a written offer to acquire the subject property has been presented, and at least one comparable replacement dwelling has been made available. Relocation benefits will be provided to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits under the act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail by an assigned Right-of-Way Specialist.

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4.6 Socioeconomics

Socioeconomic resources are features within the community that contribute to the local economy, enhance the quality of life, and support community cohesion. The study area for socioeconomic resources includes parcels and planned developments that are immediately adjacent to the construction envelope as well as the broad characteristics of the County and Brighton.

4.6.1. What is the regulatory environment?

Socioeconomic resources are regulated and guided by Sections 109(h) and 128 of Title 23 of the United States Code on Highways, and the Americans with Disabilities Act of 1990. Section 109(h) requires consideration of adverse impacts, including socioeconomic impacts, in the decision making of federal agencies. Section 128 also mandates consideration of economic and social effects of transportation projects by state Departments of Transportation. In relation to transportation, the Americans with Disabilities Act protects individuals with mental and physical disabilities against discrimination and requires that they be reasonably accommodated.

4.6.2. What is the affected environment?

The socioeconomic resources study area is located within Brighton in Adams County. The area is primarily agricultural/rural, but is currently experiencing substantial suburban development.

Demographics and Household Characteristics

From 1990 to 2000, the number of Adams County housing units increased 24 percent. Between 2000 and 2010, Adams County housing continued to grow at 17.7 percent. According to the Adams County Comprehensive Plan, roughly 80 percent of the County's housing units are located within municipalities (Adams County, 2012), such as Brighton.

In addition, Adams County's population is projected to increase from 443,603 in 2010 to 668,802 in 2035—a growth of approximately 50 percent (Department of Local Affairs, 2014). During this same timeframe, Brighton's population is expected to grow from 33,352 to 36,178 (DRCOG, 2014).

Economic Characteristics

Both Adams County and Brighton experienced an increase in unemployment between 2000 and 2010, with the County having a slightly higher unemployment rate in 2010 (7.6 percent) than Brighton (6.0 percent) (see Exhibit 4.6-1).

Exhibit 4.6-1. Employment and Unemployment Characteristics in Adams County and Brighton

Geography	Adams County	Brighton
Employment 2000	67.2%	61.4 %
Employment 2010	63.3%	59.6%
Unemployment 2000	3.3%	4.5%
Unemployment 2010	7.6%	6.0%

Source: Census 2013 (2010-2012 American Community Survey 3-Year Estimates)

The largest percentage of workers in Adams County works in educational services, health care, and social assistance; the retail trade; and professional, scientific, management, administrative, and waste management services (see Exhibit 4.6-2). Similarly, in Brighton, the largest percentages of workers are in educational services, health care, and social assistance; and in the retail trade. However, construction is also a large employment sector in Brighton (see Exhibit 4.6-2).

Exhibit 4.6-2. Employment by Sector in Adams County and Brighton

Employment Sector	Adams County	Brighton
Agriculture, forestry, fishing and hunting, and mining	1.6%	5.1%
Construction	9.9%	11.3%
Manufacturing	9.0%	8.6%
Wholesale trade	3.9%	3.0%
Retail trade	12.2%	12.0%
Transportation, warehousing, and utilities	7.5%	9.3%
Information	2.7%	2.3%
Finance, insurance, and real estate, including rental and leasing	5.7%	6.2%
Professional, scientific, management, administrative, and waste management services	11.9%	6.7%
Educational services, health care, and social assistance	16.2%	14.2%
Arts, entertainment, recreation, accommodation, and food services	9.5%	7.5%
Public administration	4.4%	6.8%
Other	5.4%	7.0%

Source: Census 2013 (2010-2012 American Community Survey 3-year estimates)

Residential Development and Community Resources

The socioeconomic resources study area is made up of primarily undeveloped lands. There is residential development to the west, with some agricultural and commercial/light industrial land to the south and east. There are three subdivisions/neighborhoods in the socioeconomic resources study area:

- **Bromley Park (a residential development).** Located on the south side of Bridge Street, west of I-76. There is a small portion of Bromley Park north of Bridge Street and west of I-76. Non-residential development in Bromley Park is south of Bridge Street and east of I-76.
- **Brighton East Farms.** Located on the north side of Bridge Street, west of I-76; this is a new planned development, but no permits have been issued yet.
- **Brighton Crossing.** Located north of Bridge Street and west of I-76, but adjacent to the west edge of the Brighton East Farms subdivision. Brighton Crossing is a master planned community with plans for more than 3,000 homes, townhomes, condominiums, and apartments at full build-out.

The closest community facilities to the socioeconomic resources study area are the Bromley East Charter School and Dewey Strong Park (Exhibit 4.6-3). Both are located approximately 800 feet from the existing Bridge Street overpass to the west of I-76 and are outside the socioeconomic resources study area. Additionally, emergency responders are located almost 3 miles to the west of the Bridge Street overpass at Station #2. In order to access I-76, they must use either Bromley Lane or Baseline Road.

4.6.3. What are the impacts to socioeconomics?

Impacts to socioeconomic resources were evaluated by identifying resources present, evaluating whether there will be direct effects due to right-of-way acquisition, and identifying effects to the function of these resources.

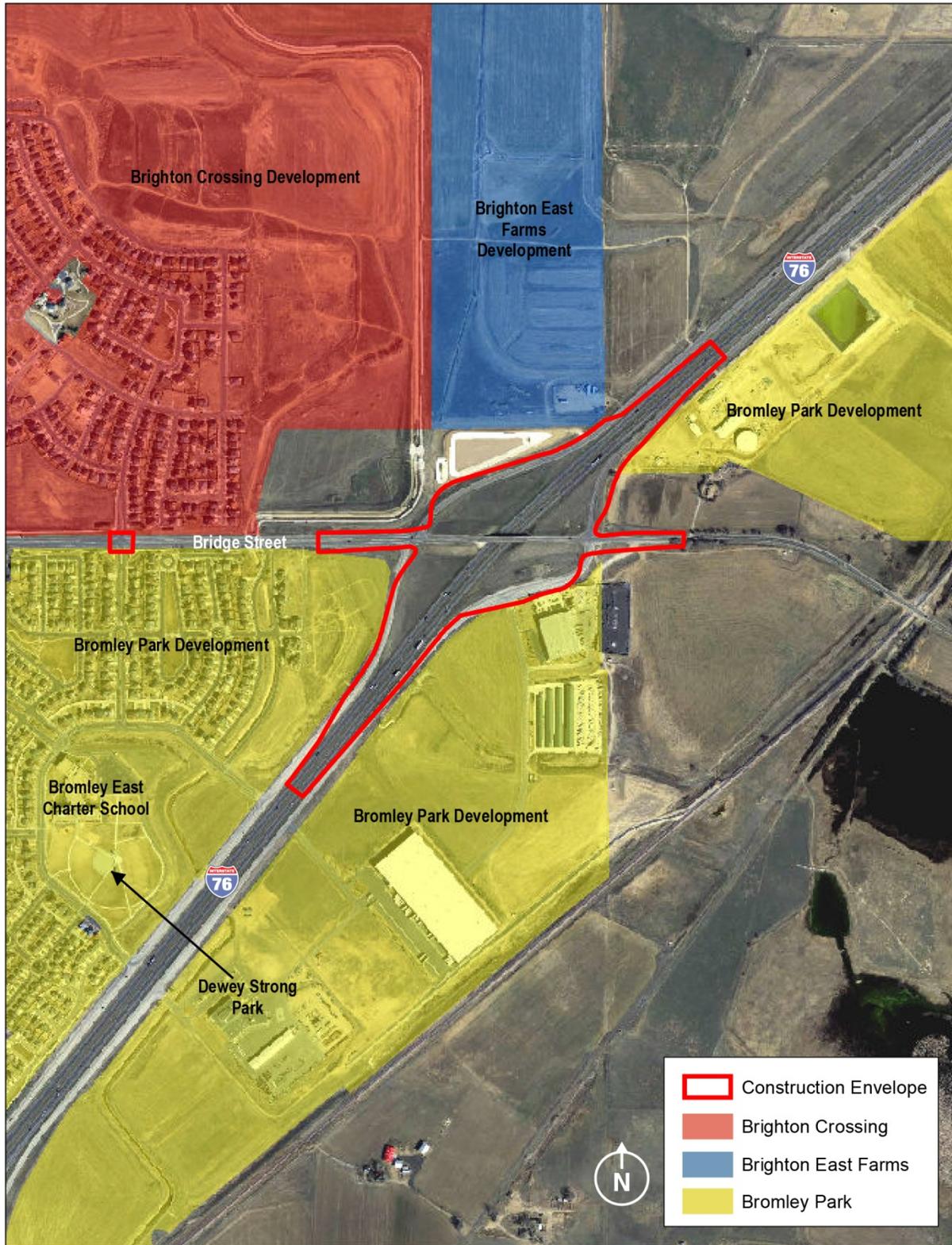
No-Action Alternative

There will be no impact to demographics and household or economic characteristics, community facilities, or neighborhoods as a result of the No-Action Alternative. However, the lack of direct access could negatively affect the area as it may be less attractive to residents and may add time to emergency service responses.

Action Alternatives

Impacts to socioeconomic resources are the same for all Action Alternatives. These are described below.

Exhibit 4.6-3. Residential Development and Community Resources in the Socioeconomic Resources Study Area



Permanent Impacts to Demographics and Household Characteristics

Brighton is transforming from a rural, agricultural town to a more suburban community. Residential development around the I-76 and Bridge Street intersection is both currently occurring and planned to occur. With this growth in population comes additional travel demand. Many of the community's new residents need access to I-76 to commute to the Denver metropolitan area. The new signal at Prairie Falcon and Bridge Street would not have an impact on demographics and household characteristics. Implementation of any of the Action Alternatives would be a positive impact since they all decrease travel time to/from I-76, which, in turn, also may reduce emergency service response time; both of these positive impacts could make the area more attractive to residents.

Construction of any of the Action Alternatives at I-76 and Bridge Street will provide residents with a more direct access to I-76 and faster travel to and from the Denver metropolitan area.

Permanent Impacts to Economic Characteristics

There are no employment centers or businesses providing a tax base within the socioeconomic resources study area; therefore, there will be no direct permanent impact to places of employment.

Permanent Impacts to Residential Development and Community Resources

There are no community resources within the immediate socioeconomic resources study area; therefore, there will be no impacts to these resources from the interchange or the new signal at Prairie Falcon and Bridge Street. Although there are residential communities to the west of the socioeconomic resources study area and new residential development is proposed, I-76 and Bridge Street already exist, so neighborhoods and communities will not be fragmented or cut off by any of the Action Alternatives. None of the Action Alternatives will affect the rate of development as the City manages growth through its building permitting process and the socioeconomic resources study area is already slated for development with the exception of the area immediately to the east of the construction envelope which is zoned industrial. All of the alternatives support the planned development in the area.

Temporary Impacts

During construction of any of the alternatives there will be increased noise, dust, and detours in traffic patterns. Detours could affect any driver using Bridge Street near I-76 including residents, commuters, and emergency service providers. There will also be a temporary economic growth within the region due to construction related jobs.

4.6.4. What are the proposed mitigation measures?

Since there are no permanent adverse impacts anticipated with any of the Action Alternatives, no mitigation is required. Mitigation measures for temporary impacts related to dust include wetting soils, covering trucks hauling soil and other fine materials, re-vegetating exposed areas, and using low-sulfur fuel. A complete list of air quality BMPs can be found in Section 4.2 of this EA. BMPs for noise impacts include the implementation of best management practices including using noise blankets and quiet-use generators, minimizing construction duration and construction proximity to residences at night, and re-routing truck away from residential areas where possible. A complete list of noise-related BMPs can be found in Section 4.3 of this EA. There also will be coordination with the emergency providers prior to construction, signage for all detours, and advance notice to the traveling public of detours and construction.

4.7 Utilities

A utility is a line, facility, or system that produces, transmits, or distributes various commodities that directly or indirectly serve the public. A utility can be private, public, or cooperatively owned. Commodities that are distributed through utilities include communications, cable television, electricity, lighting, heat, gas, oil, crude products, water, steam, sewer, stormwater, or any other similar service including any fire or police signal system or street lighting system. The study area for assessing impacts to utilities is the construction envelope, as shown in Exhibit 4.7-1.

Utilities carry commodities people use in their everyday lives for survival and convenience. They also carry products away to maintain safe, sanitary, and aesthetically pleasing conditions. Disruption to utilities during project construction can have negative economic, safety, quality of life, and other effects, further explaining their importance.

4.7.1. What is the affected environment?

Various public and private utilities are located within the utilities study area, including electric, cable TV, water, sanitary and storm sewer, communications, gas, and fiber optic. Electric, communications, and gas line utilities generally are privately owned and/or corporately operated to serve local communities. Water and sewer facilities typically are provided by local governments to residents and businesses within their jurisdictional boundaries.

The potential for utility impacts usually occurs during construction. Because the construction limits for all Action Alternatives are similar, a combination of all construction limits, called the construction envelope, was used to identify the location of potential impacts to existing utilities. Exhibit 4.7-1 shows the utilities study area used for all alternatives.

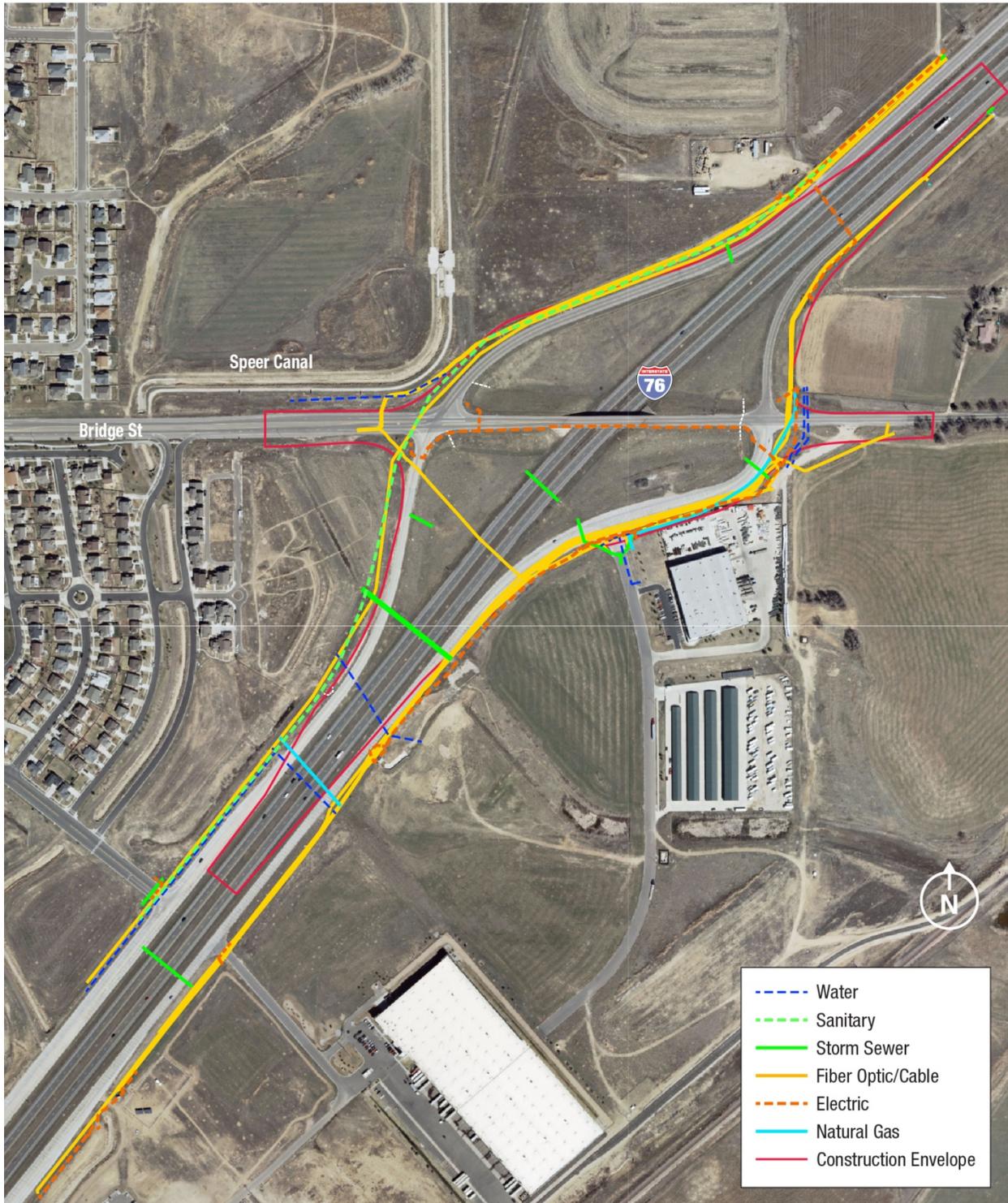
To prepare the utilities inventory and analyze potential conflicts, design drawings, spatial data, mapping, and other information available from the respective utility owners were studied.

The following subsections describe the existing utilities within the construction envelope that may be impacted by the project.

Water

Water lines provide filtered potable water to homes and businesses. There are eight water lines identified within the construction limits (see Exhibit 4.7-1). They are all underground and are owned by either United Water and Sanitation or the City of Brighton Water Department.

Exhibit 4.7-1. Existing Utilities within the Study Area



Sanitary Sewer

Sanitary sewers carry sewage from homes and businesses to wastewater treatment plants through a system of underground pipes. There is only one sewer line within the construction envelope (see Exhibit 4.7-1), and it is owned by the City of Brighton and United Water and Sanitation.

Storm Sewer

A storm sewer system can consist of curbs, gutters, drains, inlets, pipes, and open ditches that convey rainfall and other water drainage (but not sewage) to streams, lakes, or other surface water bodies. There are 21 storm sewer lines throughout the construction envelope (see Exhibit 4.7-1) all owned by CDOT.

Fiber Optics/Cable

Fiber optic lines are used as a medium for telecommunications and computer networking using pulses of light to carry data along strands of glass or plastic. They operate at higher bandwidths and frequencies than traditional copper wire carrying electrical signals, so they have much higher throughput, or capacity. Fiber optic material generally has replaced copper wire used traditionally for trunk lines in communications systems.

Approximately 12 fiber optic lines cross or run parallel to the roadway within the construction envelope (see Exhibit 4.7-1). The fiber optic and cable lines are owned by Sprint, CenturyLink, or ATT.

Electric

Two substantial underground electric power transmission lines cross the construction envelope (see Exhibit 4.7-1). In some locations, local power lines branch off the main transmission line. The electric utility lines are owned by United Power.

Natural Gas

Two existing natural gas lines are near, cross, or run parallel to the roadway (see Exhibit 4.7-1) and are owned by Xcel Energy.

An additional gas line is being proposed to cross I-76 and the frontage roads in the northern edge of the utilities study area, and then will run parallel to East Frontage Road, crossing under Bridge Street, traveling toward the south end of the utilities study area.

4.7.2. What are the impacts to the utilities?

Utility conflicts were identified by comparing the approximate construction limits with the location of major utilities. Evaluation of utility impacts used the following definitions and assumptions:

- Relocations—A utility would be moved horizontally and/or vertically to provide adequate clearances and avoid conflict.
- Adjustment—A utility would be affected by the proposed improvement, but would not require relocation. For example, adjustments to utilities might include extending pipes or culverts, extending or adding protective casings, moving inlets and associated pipes, and modifying the elevations of manholes or valves.
- A utility that crosses a roadway or ramp would likely result in an adjustment of the utility, at a minimum.
- A utility attached to a bridge would result in either an adjustment, relocation, or no impact.
- A utility running along a crossing or parallel surface street affected by construction likely would require adjustment or potential relocation.
- A utility running parallel to the roadway likely would be unaffected if it is deep enough to avoid excavation impacts.

Utility impacts were evaluated to determine if they result in adjustment or relocation of the utility lines. The subsections below present these findings.

No-Action

With the No-Action Alternative, no further improvements will be made to Bridge Street; therefore, there will be no direct, indirect, temporary, or cumulative effects to utilities.

Action Alternatives

It is probable that many of the underground utility lines are deep enough to avoid excavation impacts. Utility lines that are located under the proposed roadway will need to be relocated. With the Preferred Alternative, approximately three utility lines will need to be adjusted and 13 lines will need to be relocated. With Alternative 2 and Alternative 3, three utility lines will need to be adjusted and either 16 or 15 utility lines, respectively, will need to be relocated.

Construction of the interchange will impact some above-ground electric boxes, water valves, and light poles, which will need to be adjusted.

Exhibit 4.7-2 shows a summary of potential impacts to utilities by each alternative.

Exhibit 4.7-2. Summary of Potential Utility Impacts

Utilities	Utility Impacts Adjustment (minor)/Relocation (major)			
	No-Action Alternative	Preferred Alternative	Alternative 2	Alternative 3
Water	0/0	0/0	0/1	0/0
Sanitary sewer	0/0	0/1	0/1	0/1
Storm sewer	0/0	2/6	2/6	2/6
Fiber Optics/Cable	0/0	0/6	0/7	0/7
Electric	0/0	1/0	1/0	1/0
Natural Gas	0/0	0/0	0/1	0/1
Totals	0/0	3/13	3/16	3/15

4.7.3. What are the proposed mitigation measures?

Wherever possible, impacts to utilities will be avoided through close coordination with municipalities and utility companies during design and construction. In all cases, coordination with jurisdictions, utility companies, and other utility owners is an important component of any highway construction project. Proper coordination, planning, and design will reduce delays and improve cost efficiency. Where effects cannot be avoided, this coordination will facilitate mitigation efforts.

In some cases, utilities are an integral part of the design of an alternative. The following mitigation measures will be used to address effects:

- Conduct early coordination with utility owners to modify designs to avoid or minimize conflicts.
- Schedule service disruptions to coincide with periods of lower demand.
- Minimize service disruptions by connecting to active utilities wherever possible.
- Encase or provide protective cover over any impacted underground utilities, as necessary. This might include utilities under new or reconstructed roads or where existing cover will be reduced over a utility.
- Coordinate with utility owners and operators to identify construction requirements and financial responsibilities for relocations based upon easements, license agreements, ownership, or other existing agreements covering the use of affected utilities.
- Identify and improve any utility concerns that can be addressed as part of project implementation.

- Integrate above-ground utilities that are impacted by the project into the design, hide them from sight within the design, and/or design them to be aesthetically pleasing to the greatest extent practical.
- Move above-ground utilities underground to the greatest extent practical.

The effects to utilities during construction of the Action Alternatives will be temporary. During construction, the impacted utilities will be protected, interrupted, and/or relocated as necessary. Upon completion of construction, all major utilities will be returned to a condition equivalent to what currently exists, or they may even be improved by replacement of old material with new material.

4.8 Biological Resources

For the purposes of this EA, biological resources assessed included fish and wildlife, migratory birds, threatened and endangered species (state and federal), and vegetation. The study area for biological resources is the land and water features that are within the construction envelope and within a half-mile buffer around the envelope for raptors, as required by Colorado Parks and Wildlife (CPW).

4.8.1. What is the regulatory environment?

Regulations applicable to biological resources include the following federal and state regulations:

- **Noxious Weed Act:** The Colorado Department of Agriculture (CDOA) Noxious Weed Act of 2003 (CRS 35-5-101; CRS 35-5.5-101; EO D-006-99) defines and prioritizes management objectives for state-designated noxious weeds.
- **The United States Endangered Species Act (ESA):** Protects federally listed plant and animal species with the goal of ensuring their long-term survival.
- **The Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act:** Vegetation clearing, earth moving, bridge demolition, and other construction activities have the potential to disrupt nesting activity or destroy nests of bird species protected under the MBTA.
- **The Colorado Nongame, Endangered, and Threatened Species Conservation Act:** Provides some protection within the state for listed species and establishes the state's intent to protect endangered, threatened, or rare species.
- **Prairie Dog Protection:** The policy that will be followed is the CDOT Impacted Black-Tailed Prairie Dog Policy (CDOT, 2009).

4.8.2. What is the affected environment?

The affected environment consists of previously disturbed areas adjacent to an interstate highway and associated access roads. The following subsections discuss the existing habitat and vegetation, noxious weeds, and animal and plant species in the biological resources study area (see Exhibit 4.8-1).

Habitat and Vegetation

Habitat types within the biological resources study area include upland native or planted grasses intermixed with sporadic weedy roadside species, wetland habitat, and landscaped areas. The dominant species along much of the upland habitats include smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), sand dropseed (*Sporobolus cryptandrus*), bulbous bluegrass (*Poa bulbosa*), sideoats grama (*Bouteloua curtipendula*),

Exhibit 4.8-1. Biological Resources Study Area



and needle and thread grass (*Hesperostipa comata ssp. comata*), little bluestem (*Schizachyrium scoparium*), common herbaceous species are kochia (*Bassia scoparia*), curly dock (*Rumex crispus*), and alfalfa (*Medicago sativa*). Scattered shrubs and trees in these areas include rabbitbrush (*Chrysothamnus nauseosus*), Siberian elms (*Ulmus pumila*), and plains cottonwoods (*Populus deltoides*).

Dominant species in the wetland areas include narrowleaf cattail (*Typha angustifolia*), marsh muhly (*Muhlenbergia racemosa*), curly dock, and giant ragweed (*Ambrosia trifida*).

Noxious Weeds

Noxious weeds are present in the biological resources study area, but they are relatively few in number and do not cover large areas. Weed species identified are those commonly found in the Front Range.

Four species of weeds on the CDOA Noxious Weed List were observed during the site visit, scattered throughout the biological resources study area (CDOA, 2013) (Exhibit 4.8-2).

Exhibit 4.8-2. Noxious Weeds within the Biological Resources Study Area

Common Name	Scientific Name	State Weed List*	U.S. Department of Agriculture Code (USDA, 2013)	Density in Study Area
Scotch Thistle	<i>Onopordum acanthium</i>	B	ONAC	Low
Puncturevine	<i>Tribulus terrestris</i>	C	TRTE	Medium
Cheatgrass	<i>Bromus tectorum</i>	C	BRTE	Medium
Field Bindweed	<i>Convolvulus arvensis</i>	C	COAR4	High in discreet locations

Source: Pinyon, 2013

* List A—Species are designated for eradication, and require prevention of seed production or development of reproductive propagules.

List B—Species are managed and controlled by a noxious weed management plan, with the goal of stopping the continued spread of these species.

List C—Species for which a project would develop management plans with the goal of supporting jurisdictions that choose to require management of those species (CDOA, 2013).

Threatened, Endangered, and Sensitive Species

Federally listed species, state-listed species, and migratory birds with the potential to be impacted by the project and that are considered threatened, endangered, and sensitive species are discussed in detail in the following subsections.

Federally Listed Species

Per the U.S. Fish and Wildlife Service (USFWS), there are nine federally listed species with the potential to occur in, or be impacted by, any construction projects in Adams County (USFWS, 2014), including building a new interchange at I-76 and Bridge Street. Suitable habitat for these nine species is not located in the biological resources study area (see

Exhibit 4.8-3). Further information can be found in Appendix D: *Biological Resources Technical Report*.

Exhibit 4.8-3. Federally Listed Threatened and Endangered Species and Their Potential to Occur in the Biological Resources Study Area

Common Name	Species	Federal Status*	Habitat	Potential for Occurrence in Study Area
Birds				
Least Tern	<i>Sterna antillarum</i>	FE	Nests in summer along reservoirs, lakes, and rivers with bare sandy shorelines or islands	None; occur downstream of biological resources study area and are listed in county because they can be affected by South Platte River depletions
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	FT	Mature, old-growth forests that possess complex structural components; canyons, riparian, and conifer communities	None; suitable habitat does not occur in the biological resources study area
Piping Plover	<i>Charadrius melodus</i>	FT	Wetlands, lakeshores, and marshes; nesting habitat is along reservoirs, lakes, and rivers with bare sandy/pebbly areas with sparse vegetation	None; occur downstream of biological resources study area and are listed in county because they can be affected by South Platte River depletions
Whooping Crane	<i>Grus americana</i>	FE	Utilizes wetlands, irrigated meadows, and reservoir edges as stopovers during migration	Low; could occur during migration, although unlikely; also occur downstream of the biological resources study area and can be affected by South Platte River depletions

Common Name	Species	Federal Status*	Habitat	Potential for Occurrence in Study Area
Fish				
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	FE	Known population in Mississippi River from Missouri to the Gulf of Mexico	None; occur downstream of biological resources study area and are listed in county because they can be affected by South Platte River depletions
Mammals				
Preble's Meadow Jumping Mouse	<i>Zapus hudsonicus preblei</i>	FT	Occurs along Front Range of Colorado along permanent or intermittent streams in areas with herbaceous cover and adequate cover of shrubs and trees	None; suitable habitat does not occur in the biological resources study area
Plants				
Colorado Butterfly Plant	<i>Gaura neomexicana</i> var. <i>coloradensis</i>	FT	Stream channel sites that are periodically disturbed, sub-irrigated alluvial soils along streams; open meadows on floodplains, including riparian areas	None; suitable habitat does not occur in the biological resources study area
Ute Ladies'-Tresses Orchid	<i>Spiranthes diluvialis</i>	FT	Sub-irrigated alluvial soils along streams; open meadows on floodplains, including riparian areas	None; suitable habitat does not occur in the biological resources study area
Western Prairie Fringed Orchid	<i>Platanthera praeclara</i>	FT	Mesic to wet unplowed tall-grass prairies and meadows	None; occur downstream of biological resources study area and are listed in county because they can be affected by South Platte River depletions

Source: USFWS, 2014

*Federal status abbreviations: FT = federally listed as threatened; FE = federally listed as endangered

State-Listed Species

Colorado Parks and Wildlife lists 74 species of amphibians, birds, fish, mammals, reptiles, and mollusks as endangered, threatened, or of special concern within the state of Colorado (CPW, 2013). The majority of these species are not expected to occur in the biological resources study area because the study area is outside of their range and/or appropriate habitat is not present. According to the Colorado Natural Heritage Program (CNHP)

Tracking List and habitat requirements, eight state-listed sensitive species were identified with the potential to occur within the biological resources study area (CNHP, 2012) (see Exhibit 4.8-4). Two state-listed species also are on the federal list—the Preble’s meadow jumping mouse (PMJM) and Mountain Plover—and are assessed in the Federally Listed Species section of this document. More information can be found in Appendix D: *Biological Resources Technical Report*.

Exhibit 4.8-4. State-Listed Threatened and Endangered Species and Their Potential to Occur in the Biological Resources Study Area

Common Name	Species	State Status*	Habitat	Potential for Occurrence in Study Area
Amphibians				
Northern Leopard Frog	<i>Lithobates pipiens</i>	SC	Typical habitats include wet meadows and the banks and shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches	Low; suitable habitat exists along the West Burlington Extension Ditch in the biological resources study area
Birds				
Bald Eagle	<i>Haliaeetus leucocephalus</i>	ST	Habitat includes reservoirs and rivers; in winter, they also may occur locally in semi-deserts and grasslands, especially near prairie dog towns	Low; could occur during migration or winter roosting, although unlikely due to the lack of large trees in the biological resources study area
Ferruginous Hawk	<i>Buteo regalis</i>	SC	Preferred habitat is arid and semiarid grassland, foothills or mid-elevation plateaus with few trees; Avoids cultivated fields and developed areas	None; suitable habitat does not occur in the biological resources study area
Mammals				
Black-footed Ferret	<i>Mustela nigripes</i>	SE	Occurs in grasslands or shrublands in association with prairie dog colonies	None; population has been extirpated in Colorado, with the exception of managed experimental populations
Black-Tailed Prairie Dog	<i>Cynomys ludovicianus</i>	SC	Habitat consists of intermixed shrublands, sagebrush habitat, and/or shortgrass and mixed-grass prairies; occurs in central and south-central Colorado	None observed in the biological resources study area

Common Name	Species	State Status*	Habitat	Potential for Occurrence in Study Area
Reptiles				
Common Garter Snake	<i>Thamnophis sirtalis</i>	SC	Inhabits marshes, ponds, and the edges of streams and for the most part restricted to aquatic, wetland, and riparian habitats along the floodplains of streams	Low; very minimal habitat exists along the West Burlington Extension Ditch in the biological resources study area

Sources: CNHP, 2012; USFWS, 2014

*State status abbreviations: ST = state listed as threatened; SE= state listed as endangered; SC = state listed Species of Concern

Migratory Birds

The grassy upland areas and small trees in the biological resources study area could be used as nest sites. Additionally, there are a few large trees to the west in the southern portion of the biological resources study area and to the east within the half-mile raptor biological resources study area that could be used by nesting raptors. These habitats are within the nesting raptor buffer area for many species (CPW, 2008). During the site visit, Cliff Swallow (*Petrochelidon pyrrhonota*) nests were observed in the concrete box culvert of the West Burlington Extension Ditch that passes under I-76 (see Exhibit 4.8-1).

4.8.3. What are the impacts to biological resources?

Biological resources were overlaid onto the No-Action and Action Alternatives construction envelope to identify areas of potential direct and indirect impacts.

No-Action Alternative

There will be no direct impacts to biological resources under the No-Action Alternative.

Action Alternatives

All three Action Alternatives will have very similar impacts to biological resources, with the only difference being the slight difference in footprint of each Action Alternative. Impacts for all three alternatives are discussed below.

Habitat and Vegetation

There will be minimal direct permanent impacts to habitat and vegetation in the biological resources study area due to the construction of the interchange and no permanent impact from the installation of a new traffic signal at Prairie Falcon. The majority of construction-related activities will occur within existing right of way, which has been previously disturbed; therefore, impacts to natural vegetation and habitat will be minimal.

Noxious Weeds

There would be direct permanent and temporary impacts caused by noxious weeds from the construction of any of the Action Alternatives. Project-related construction could introduce new noxious weeds into the biological resources study area or increase the abundance of existing noxious weeds. Construction activities include mobilization of construction vehicles, excavation and transport of borrow material and topsoil, land clearing, and reclamation. Removal of existing vegetation and disturbance of soils could encourage germination and spread of weed seeds and roots. Airborne seeds from noxious weeds present in areas adjacent to the project could germinate in areas where vegetation has been removed.

Indirect impacts from construction of any of the Action Alternatives could include the spread of noxious weeds from within the area to other areas not currently invaded.

Threatened, Endangered, and Sensitive Species

Since the biological resources study area lacks suitable habitat for four of the nine federally listed threatened and endangered species, the project will likely have no effect on them. These four species include the Colorado butterfly plant, Ute ladies'-tresses orchid, Preble's meadow jumping mouse, and the Mexican Spotted Owl.

Five of these nine federally listed species have been listed in Exhibit 4.8-3 because they could occur south of the biological resources study area along the South Platte River. This project and others that occur in the Platte River basin have the potential to deplete water in tributaries of the Platte River through practices such as using water for dust suppression and soil moisture treatments. Depleting water in the watershed could adversely affect the five species.

Migratory Birds

There would be permanent and temporary impacts to vegetation habitat in the biological resources study area due to the construction of the interchange, although the area has been previously disturbed. Construction activities could negatively affect migratory birds' nesting activities due to associated noise, vibration, and human activity.

No raptor nests were observed in or around the biological resources study area; however, limited suitable habitat does occur in the area, primarily within large trees less than a half-mile southwest and east within the raptor area. There will be potential for raptors to nest in these areas prior to construction; therefore, there is the potential to impact raptors within the CPW buffer that has been established for nesting raptors.

Cliff Swallow nests were observed in the existing box culvert structure of the West Burlington Extension Ditch under I-76. Therefore, work near the culvert could have the potential to impact nesting swallows.

4.8.4. What are the proposed mitigation measures?

CDOT and FHWA are participating in the South Platte Water Related Activities Program (SPWRAP) and have submitted a Programmatic Biological Assessment to the USFWS. A Biological Opinion (ES/CO: ES/LK-6-CO-12-F-020) was issued. Mitigation measures for potential impacts to downstream species are outlined in the Programmatic Biological Assessment and Biological Opinion (PBA/BO). Therefore, any depletion and associated adverse effect to the five downstream species will be mitigated through CDOT's participation in the SPWRAP.

The mitigation strategies that will be used to limit impacts to biological resources during construction are described in the subsections below.

Noxious Weeds

There are weeds in the biological resources study area, but they do not dominate the study area and do not cover large areas. Therefore, a noxious weed management plan is not recommended. However, during construction, the project is required to minimize the spread of noxious weeds according to the revised Sections 207, 212, and 217 of the CDOT Standard Specifications, and to implement the standard CDOT BMPs designed to prevent the spread of noxious weeds, which are:

- Minimize soil disturbance to the greatest extent possible
- Clean all equipment will be thoroughly before entering the construction site
- Do not stage equipment in weed-infested areas
- Coordinate weed management efforts with local jurisdictional agencies and adjacent landowners to the greatest extent possible
- Use herbicide immediately adjacent to wetlands and/or water bodies only if the label indicates that the use is appropriate for such areas
- Re-seed all disturbed soil with a pure live seed tested for germination and purity within seven days of completion of work during the growing season
- Do not use "A" horizon soil material currently supporting noxious weed cover of more than 10 percent as topsoil during re-vegetation
- Do not import topsoil due to the potential for spread of noxious weeds
- Monitor and re-treat all areas treated for noxious weeds during construction if necessary to prevent re-establishment of noxious weeds
- Use only compost that is Seal of Testing Assurance certified weed-free; weed-free is defined and regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS

Federally Listed Threatened and Endangered Species

A total of nine federally listed threatened and endangered species have the potential to occur in the biological resources study area. Four of these will not be impacted. Mitigation for five federally listed downstream species will follow the PBA/BO mitigation from the SPWRAP.

Migratory Birds

Impacts to birds protected under the MBTA will follow CDOT Specification 240: *Protection of Migratory Birds*. This includes the following:

Tree and Shrub Removal or Trimming:

- Tree and shrub removal or trimming will occur before April 1 or after August 31 if possible. If tree and shrub removal or trimming will occur between April 1 and August 31, a survey for active nests will be conducted by a biologist within the seven days immediately prior to the beginning of work in each area or phase of tree and shrub removal or trimming.
- If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest will remain undisturbed and protected until the nest becomes inactive. The nest will be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate by a biologist and approved by the CDOT Engineer. Work will not proceed within the fenced buffer area until the young have fledged or the nests have become inactive.
- If the fence is knocked down or destroyed by the Contractor, the CDOT Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time.

Grasses and Other Vegetation Management:

- Due to the potential for encountering ground nesting birds' habitat, if work occurs between April 1 and August 31, the area will be surveyed by a biologist within the seven days immediately prior to ground-disturbing activities. The Contractor will notify the CDOT Engineer at least 10 working days in advance of the need for a biologist to perform the survey.
- The undisturbed ground cover—to 50 feet beyond the planned disturbance, or to the right-of-way line, whichever is less—will be maintained at a height of six inches or less beginning April 1 and continuing until August 31 or until the end of ground disturbance work, whichever comes first.
- If birds establish a nest within the survey area, an appropriate buffer of 50 feet will be established around the nest by a biologist. This buffer dimension may be changed

if determined appropriate by a biologist and approved by the CDOT Engineer. The Contractor will install fence (plastic) at the perimeter of the buffer. Work will not proceed within the buffer until the young have fledged or the nests have become inactive.

- If the fence is knocked down or destroyed by the Contractor, the CDOT Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to this suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time.

Work on Structures:

- The Contractor will perform work on structures in a manner that does not result in a taking of migratory birds protected by the MBTA. The Contractor will not perform the work on structures during the primary breeding season, April 1 through August 31, unless he takes the following actions:
 1. The Contractor will remove existing nests prior to April 1.
 2. During the time that the birds are trying to build or occupy their nests, between April 1 and August 31, the Contractor will monitor the structures at least once every three days for any nesting activity.
 3. If birds have started to build any nests, the nests will be removed before they are completed. Water will not be used to remove the nests if nests are located within 50 feet of any surface waters.
 4. Installation of netting may be used to prevent nest building. The netting will be monitored and repaired or replaced as needed. Netting will consist of a mesh with openings that are three quarters of an inch by three quarters of an inch or less.
- If an active nest becomes established, i.e., there are eggs or young in the nest, all work that could result in abandonment or destruction of the nest will be avoided until the young have fledged or the nest is unoccupied, as determined by a biologist and approved by the CDOT Engineer. The Contractor will prevent construction activity from displacing birds after they have laid their eggs and before the young have fledged.
- If the project continues into the following spring, this cycle will be repeated. When work on the structure is complete, the Contractor will remove and properly dispose of netting used on the structure.

Potential Impact to Raptors Protected under the MBTA

Pre-construction surveys for nesting raptors will be carried out in accordance with CPW's *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors* guidelines for pre-construction surveys (See Appendix D of the *Biological Resources Technical Report*).

Impacts to raptors identified will follow CPW's *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors* guidelines (See Appendix D of the *Biological Resources Technical Report*).

4.9 Wetlands and Open Waters

Wetlands and open waters are important natural resources that provide a number of functions in the project area, including improving water quality, providing aquatic and wildlife habitat, and helping with flood protection. The study area for wetlands and open waters includes the water features that are in or adjacent to the construction envelope.

4.9.1. What is the regulatory environment?

Wetland resources are protected under Section 404 of the Clean Water Act (CWA) and under EO 11990, Protection of Wetlands (Federal Register, 1977). Many wetlands and open water features are considered jurisdictional Waters of the U.S. (WUS) by the USACE. Projects that will discharge dredged or fill materials into waters of the U.S., including wetlands, are subject to permitting by the USACE.

Non-jurisdictional wetlands are not subject to permitting by USACE under Section 404. However, all federal agencies are required to avoid and minimize wetland impacts to the greatest extent possible, per EO 11990. To be consistent with FHWA policies, CDOT follows guidelines that require mitigation of impacts to all wetlands, regardless of jurisdiction, on a 1:1 ratio.

4.9.2. What is the affected environment?

A site visit of the wetlands study area was performed on September 12, 2013, to identify and delineate existing wetlands and other water features within the wetlands study area (see Exhibit 4.9-1). The wetland delineation was completed in accordance with the 1987 USACE *Wetland Delineation Manual* (USACE, 1987), and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation: Great Plains Regional Supplement* (USACE, 2010).

Wetlands

Two palustrine emergent (PEM) wetlands were delineated (WL-01 and WL-02) (Cowardin, et al., 1979) (see Exhibit 4.9-2). WL-01 is located on the southwest corner of the intersection of East Frontage Road and Bridge Street on the east side of I-76 and is within the construction envelope. It was dominated by narrowleaf cattails (*Typha angustifolia*), an obligate herbaceous wetland species. WL-02 was delineated south of Bridge Street and west of I-76 and West Frontage Road and is adjacent to the construction envelope. WL-02 was dominated by narrowleaf cattails, marsh muhly (*Muhlenbergia racemosa*), giant ragweed (*Ambrosia trifida*), and curly dock (*Rumex crispus*).

Exhibit 4.9-1. Wetlands and Open Waters within the Wetlands Study Area



The wetland areas are grouped into Assessment Areas (AAs) to analyze the functional capacity of the wetlands, per CDOT's Functional Assessment of Colorado Wetlands (FACWet) methodology. AAs typically are based on hydrogeomorphic class, wetland type, and location. The two wetland zones in the wetlands study area have been grouped into a single AA (AA-1) based on hydrogeomorphic class, wetland type, and plant community. As noted, WL-01 and WL-02 are both PEM wetlands with similar hydrological sources.

The overall FACWet Functional Capacity Index for AA-1 was 0.67, meaning that there has been obvious alteration and degradation of the wetland, but that it still supports basic wetland functioning, albeit at an impaired level. There are three main stressors for AA-1:

1. The presence of the I-76 corridor and frontage roads
2. Nearby commercial, residential, and industrial development
3. The presence of weeds

These three stressors contribute to the degradation of the functioning of migration and dispersal of organisms that use the wetland, the water source, and distribution of water within AA-1, the outflow of water from AA-1, the geomorphology, and the chemical environment.

Additional information on wetlands, including FACWet and USACE data forms and figures, can be found in Appendix E: *Wetland Finding Report*.

Open Waters

The primary hydrologic features within the wetlands study area is the West Burlington Extension Ditch and the Speer Canal, which both flow toward the north. The wetlands study area also receives stormwater runoff from the surrounding roadways, including I-76 and Bridge Street. Three open waters were delineated in the wetlands study area (OW-1, OW-2, and OW-3) (see Exhibit 4.9-1). OW-1 is a small open water area just north of the West Burlington Extension Ditch, northeast of the ditch crossing at I-76. The West Burlington Extension Ditch (OW-2) is located in the southern portion of the wetlands study area, and crosses I-76 via a box culvert in an east-west direction. Water in both the ditch and OW-1 was likely the result of heavy rains prior to the field survey, since the survey was completed during a period of unusually heavy rain in September 2013. The Speer Canal (OW-3) is located in the northwest portion of the wetlands study area, northwest of the I-76 and Bridge Street overpass.

4.9.3. What are the impacts to wetlands and open waters?

Wetlands and open waters were measured by collecting global positioning system (GPS) data in the field. This information then was overlaid with the alternatives' design to identify potential impacts.

No-Action Alternative

There will be no permanent or temporary impacts to wetlands or open waters under the No-Action Alternative.

Action Alternatives

All three Action Alternatives will have the same impacts to wetlands (see Exhibit 4.9-2). There will be 0.01 acre (585 square feet) of permanent impact to WL-01. There will be no permanent impact to WL-02. There could be temporary impacts to either wetland area during construction. None of the Action Alternatives will have any permanent or temporary impacts to open waters.

Exhibit 4.9-2. Impacts to Wetlands

Wetland ID	Wetland Location	Wetland Classification*	Total Wetland Area Acreage (sq. ft.)	Action Alternatives Permanent Impact ¹ Acreage (sq. ft.)	No-Action Alternative Permanent Impact Acreage (sq. ft.)	Jurisdictional Status ²
WL-01	Southwest corner of the intersection of East Frontage Road and Bridge Street, on the east side of I-76	PEM	0.01 ac (585 sq. ft.)	0.01 ac (585 sq. ft.)	0.00 ac (0 sq. ft.)	Unlikely, but assumed Jurisdictional
WL-02	South of Bridge Street, and west of I-76 and West Frontage Road	PEM	0.02 ac (872 sq. ft.)	0.00 ac (0 sq. ft.)	0.00 ac (0 sq. ft.)	Jurisdictional
Total Wetland Impacts				0.01 (585 sq. ft.)	0.00 ac (0 sq. ft.)	—

PEM = Palustrine emergent wetland

¹ Impact is the same for all three Action Alternatives

² Assumed jurisdictional status based on project review; USACE consultation will be held during final design of the project

Construction activities disturb the ground, which increases the likelihood of noxious weeds becoming established. Final construction plans have not been developed yet; therefore, it is not known precisely how much indirect impact could result from those activities. Mitigation recommendations are included below and are applicable regardless of the construction plans.

4.9.4. What are the proposed mitigation measures?

Per Section 404 of the CWA, impacts to wetlands and other water features must be avoided, minimized, or mitigated (in order of preference). During the design process, impacts to wetlands were avoided to the greatest extent possible. It was not possible to avoid impact to WL-1 due to the location of the I-76 northbound off ramp and radius needed to allow for truck movements exiting the interstate. The impacted wetland will be mitigated in accordance with CDOT and USACE policy. It is assumed that the wetland is jurisdictional, though consultation with USACE will take place at final design. An NWP is anticipated, along with compliance with CDOT mitigation standards.

The wetlands study area was evaluated for the potential for onsite mitigation for the 0.01 acre (585 square feet) of permanent impacts to wetlands. Because of insufficient natural hydrology and right of way requirements, the successful re-establishment of wetlands would be difficult. Major drainage, hydrological improvements, and slope changes will be needed for onsite mitigation. Onsite mitigation will result in a costly and time-consuming process, with no guarantee of the establishment of a successful wetland habitat. Instead of pursuing this mitigation option, the project can purchase credits from a wetland mitigation bank. Three USACE-approved banks are located within the same watershed as the project, including the Middle South Platte, Mile High, and Riverdale Wetland Mitigation Banks. If credits are purchased, they would likely be purchased from one of these three banks.

Temporary impacts could result from construction activities. These impacts will be minimized by the implementation of a Stormwater Management Plan (SWMP). The potential for the spread of noxious weeds will be minimized by re-seeding upland and wetland areas disturbed by construction with native species, in accordance with Sections 207, 212, and 217 of the CDOT Standard Specifications, and by implementing the standard CDOT BMPs. This information is summarized in Appendix E: *Wetland Finding Report*.

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4.10 Water Resources and Water Quality

Water resources and water quality can be affected by the operation and maintenance of transportation facilities, as well as by construction of the transportation system. The study area for water resources is the construction envelope.

4.10.1. What is the regulatory environment?

The federal CWA was established to protect and restore the quality of the nation's navigable waters. The CWA requires states to classify the intended uses (designated uses) of all surface water bodies and to develop criteria to protect the designated uses of these water bodies. The state of Colorado has established regulations that identify these designated uses and water quality standards.

The state of Colorado passed the Water Quality Control Act (WQCA) to fulfill the provisions set forth in the CWA. A nine-person commission was formed to serve as a governing body responsible for developing and maintaining a comprehensive and effective program for the prevention, control, and abatement of water pollution and for water quality protection throughout the state. The Colorado Water Quality Control Commission (WQCC) is tasked with the authority to create and amend the WQCA Regulations. The following WQCA Regulations are applicable to the water resources study area:

- Regulation #42, Site-Specific Water Quality Classifications and Standards for Ground Water (Colorado Department of Public Health and Safety (CDPHE), 2006)
- Regulation #61, Colorado Discharge Permit System Regulations (CDPHE, 2011)
- Regulation #31, The Basic Standards and Methodologies for Surface Water (CDPHE, 2012a)
- Regulation #41, The Basic Standards for Ground Water (CDPHE, 2012b)
- Regulation #38, Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin, Republic River Basin, Smoky Hill River Basin (CDPHE, 2013)

4.10.2. What is the affected environment?

Any water bodies that could receive runoff from the I-76 and Bridge Street overpass and frontage roads can be impacted by this project. The bodies of water impacted by the project include surface water and groundwater and are discussed in more detail in the following subsections.

Surface Water

Much of the water resources study area is developed with road surfaces. During precipitation events, typical transportation-related pollutants—including grease, oil, de-

icing salts, sediment, and other nutrients—may wash into the adjacent surface water bodies.

The I-76 and Bridge Street Interchange Project study area (see Exhibit 4.10-1) is located within the South Platte River Basin, which has a drainage area of approximately 24,300 square miles (USGS, 2013). Streams within the basin are utilized for agricultural and urban uses resulting in low flows for dilution of contaminants. Alteration of the natural flow regime due to the use of the streams over time has degraded native aquatic habitat along the streams.

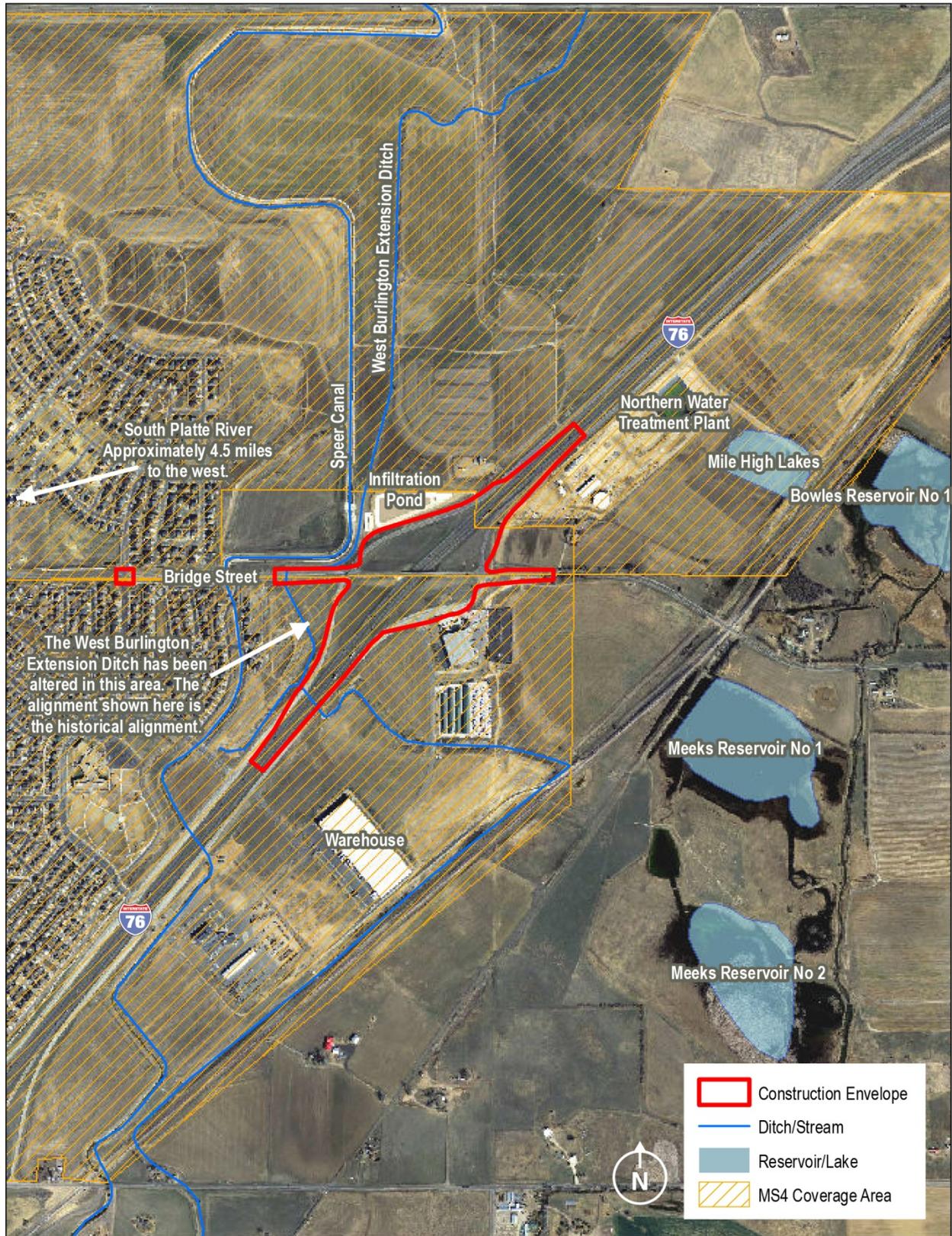
The South Platte River is located approximately 4.5 miles west of the construction envelope. Meeks Reservoir Numbers One and Two are located approximately one-half mile southeast of the water resources study area, with Bowles Reservoir Number One located approximately one-half mile east. One of the Mile High Lakes is located approximately one quarter mile east of the water resources study area. Runoff from the water resources study area does not directly enter any of the reservoirs.

The Speer Canal and West Burlington Extension Ditch are located adjacent to the west overpass, and an infiltration pond is located adjacent to the northwest. The Northern Water Treatment Plant, including two detention ponds, is located east-northeast of the water resources study area. Stormwater drainage infrastructure is present to collect runoff from the existing roadways.

The designated use classifications for this segment include: (1) Aquatic life (warm 2), (2) Recreation E, (3) Water supply, and (4) Agriculture. Use classifications are defined as follows:

- **Aquatic life (warm 2):** Waters not capable of sustaining a wide variety of cold water animals or plant life
- **Recreation E:** Waters where primary contact uses have been documented or are presumed present
- **Water supply:** Waters suitable or intended to become suitable for potable water supplies
- **Agriculture:** Surface waters suitable or intended to become suitable for irrigation or crops that are not hazardous as drinking water for livestock

Exhibit 4.10-1. Water Resources within the Water Resources Study Area



Water quality standards also consist of criteria to protect designated beneficial uses, not to exceed a specific concentration (e.g., odor). Numeric criteria are based upon data and assessment of the harmful effects of a pollutant, and are specified as chemical concentration or other physical characteristic, such as temperature. The standards established by the WQCC serve to maintain water quality for designated uses or to improve the water quality. If numeric standards for a stream segment cannot be met after the application of required controls and effluent limitation, Section 303(d) of the CWA requires the EPA to list that stream segment as “impaired.” Impaired streams are subject to additional requirements and control measures under the CWA. The stream segments located near the water resources study area are not impaired; therefore, they are not subject to additional requirements.

Those construction projects that occur on state and interstate highways and the respective right of way within the jurisdictional boundaries of CDOT that are within Municipal Separate Storm Sewer System (MS4) areas, including new highway projects and significant highway modifications, require a CDOT MS4 permit. Portions of the water resources study area are located within the CDOT MS4 permit coverage area (CDOT, 2007).

Groundwater

Typically, groundwater flow direction mimics topography. Based on the topographic conditions of the water resources study area, the groundwater flow direction is likely toward the east-southeast. Groundwater at the water resources study area occurs at approximately 20 feet below ground surface (Hillier, et al, 1983). Two permitted groundwater wells for residential use were identified within the water resources study area (CDWR, 2013).

The water resources study area has historically been utilized for agriculture. The current alignment of I-76 has served as a transportation corridor since at least the mid-1940s. Residential, commercial, and light industrial development has occurred near the water resources study area since the early-2000s. No regulated material facilities have been identified at or near the water resources study area. Based on the historical use of the water resources study area, groundwater is likely not contaminated (Pinyon, 2013).

4.10.3. What are the impacts to water resources?

Water quality impacts were examined in relation to the amount of new impervious surface that would be added to the existing transportation network associated with the No-Action Alternative and the three Action Alternatives.

No-Action Alternative

No permanent or temporary impacts to surface water or groundwater will occur under the No-Action Alternative. Existing impacts to water quality may continue. Runoff containing pollutants from the existing bridge and road surfaces will continue to wash into nearby

water resources (reservoirs, canal, ditch, infiltration, and detention ponds) during precipitation events.

Action Alternatives

All three Action Alternatives will result in ground disturbance and increase the potential for erosion and movement of sediment from the site into surface waters due to an increase in impervious surface area. The increased impervious surface is due to the construction of the interchange, not the installation of a new traffic signal at Prairie Falcon. The Preferred Alternative will increase the impervious surface area by approximately 214,320 square feet; Alternative 2 will increase the impervious surface area by approximately 214,550 square feet; and Alternative 3 will increase the impervious surface area by approximately 214,440 square feet from the existing conditions. Due to the increase in impervious surface area resulting from any of the three alternatives, it is assumed that both erosion control for construction and post-construction permanent features or adjustments to existing features will be necessary to manage the increased runoff.

The Speer Canal, West Burlington Extension Ditch, and the infiltration pond will not be directly impacted by any of the Action Alternatives. All three Action Alternatives will require the relocation or removal of the piping system associated with the stormwater drainage infrastructure. The culvert that channels the flow from the West Burlington Extension Ditch under Bridge Street at the western portion of the water resources study area likely will not be impacted by any of the Action Alternatives.

The reservoirs located east and southeast of the water resources study area will not be directly impacted by any of the Action Alternatives. The water treatment facility located east-northeast of the water resources study area and groundwater wells near the water resources study area also will not be directly impacted.

The Action Alternatives will impact a CDOT MS4 permitted area. Section 402(p)(3)(B) of the CWA states that municipal stormwater permits will require controls to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP).

Any of the Action Alternatives could indirectly impact surface waters due to ground disturbance during the construction of the new interchange and the unlikely potential to encounter subsurface contaminants that could be released into the environment.

Disturbance and erosion of underlying soil, stockpiles, and access roads during construction can contribute to increased runoff into surface water bodies. Accidental spills from machinery, drilling activities, and storage tanks can affect water quality during construction. Staging areas located adjacent to the infiltration pond, canal, or nearby reservoirs could have water quality impacts.

4.10.4. What are the proposed mitigation measures?

BMPs will be utilized during construction and the storm sewer system will be permanently upgraded. The CDOT MS4 permit requires stormwater evaluations and implementation of adequate mitigation to ensure compliance with applicable control regulations, water quality standards, and the CWA. In compliance with the permit requirements, strategies will be developed and implemented that include a combination of structural and non-structural BMPs, a regulatory mechanism to require post-construction implementation of BMPs, and adequate long-term operation and maintenance of BMPs.

In compliance with CDOT's MS4 permit, the following guidance documents will be utilized:

- CDOT's *Erosion Control and Stormwater Quality Guide* (updated 2002)
- CDOT's *Drainage Design Manual* (Drainage Manual) (updated 2004)
- CDOT's *Standard Specifications for Road and Bridge Construction* (Specifications) (updated 2011)

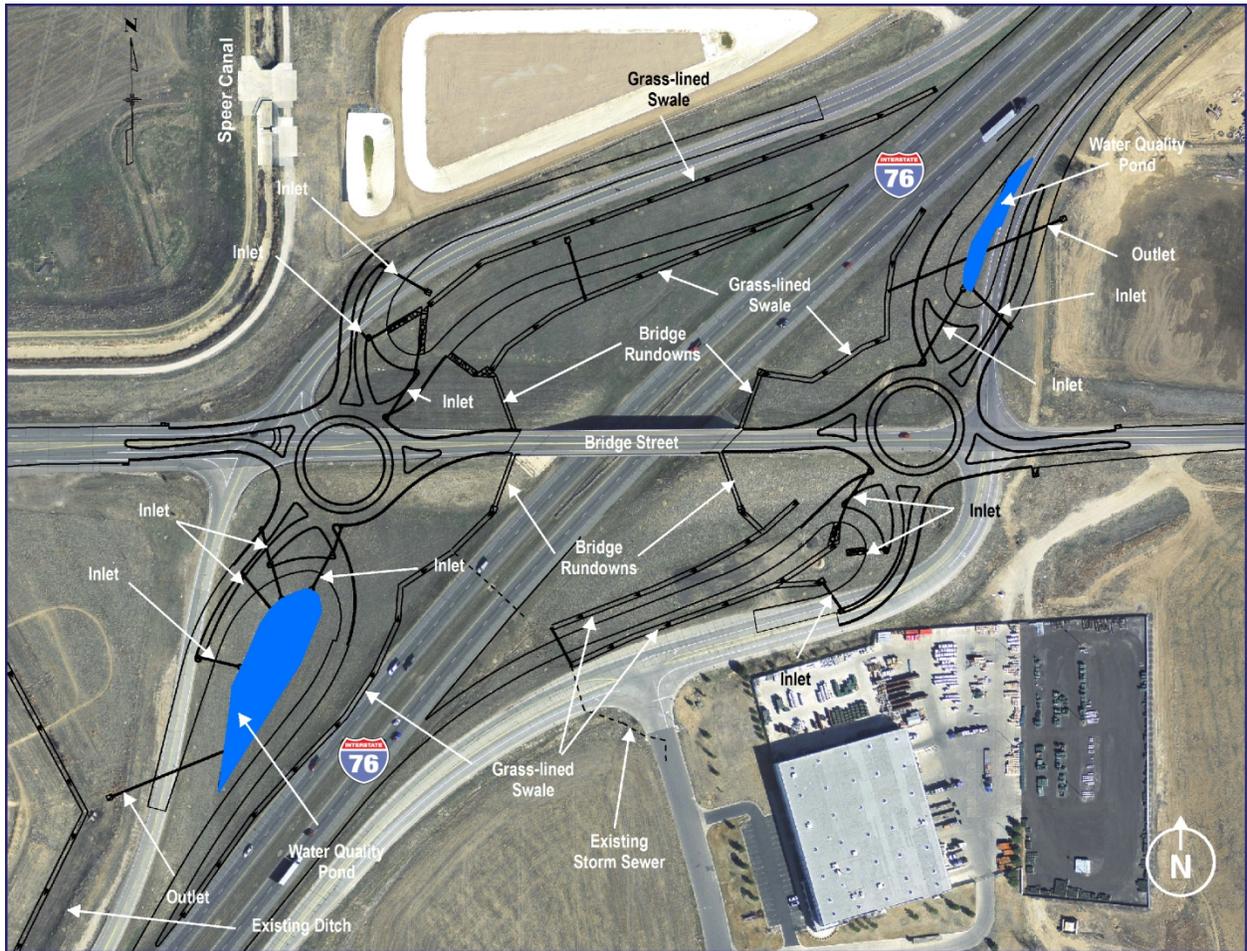
Under CDOT's current MS4 permit, 100 percent water capture and treatment for new impervious surfaces and resurfaced areas is required. To comply with this requirement, the following design elements have been included in the Action Alternatives: rundowns at each bridge abutment, grass-lined swales, curb and gutter with inlets, and a water quality pond that will be built in the southwest quadrant of the interchange (see Exhibit 4.10-2).

Regulations and guidance that are current at the time of final design and construction will be followed for this project.

Construction BMPs

Best management practices from the *Erosion Control and Stormwater Quality Guide* will be utilized during construction to reduce construction-related and/or long-term operation impacts to water resources and water quality as appropriate (CDOT, 2002). A stormwater management plan (SWMP) will be developed.

Exhibit 4.10-2. Permanent Water Quality BMPs



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4.11 Hazardous Materials

Hazardous materials may exist within the area at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. Examples of hazardous materials include asbestos, lead-based paint, heavy metals, dry-cleaning solvents, and petroleum hydrocarbons (e.g., gasoline and diesel fuels) that could be harmful to human health and the environment.

The study area for hazardous materials is the construction envelope; to evaluate the potential for hazardous materials to be encountered, a records search of known hazardous materials was completed within a half mile of the existing Bridge Street overpass.

4.11.1. What is the regulatory environment?

Hazardous materials are regulated by various state and federal regulations. NEPA, as amended (42 USC §4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that decisions involving federal funds and approvals consider environmental effects from hazardous materials. Other applicable regulations include the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC §9601 et seq.), which provides federal authority for the identification, investigation, and cleanup of sites throughout the United States that are contaminated with hazardous substances (as specifically designated in the Act) and the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC §321 et seq.), which establishes a framework for the management of both solid and hazardous waste.

The federal Hazardous and Solid Waste Amendments of 1984 establishes a new comprehensive regulatory program for underground storage tanks (UST) containing petroleum products and hazardous chemicals regulated under CERCLA. Hazardous waste USTs are regulated under the RCRA hazardous waste program. The CDPHE regulates solid waste under the Colorado Solid Waste Regulation (6 Code of Colorado Regulations [CCR] 1007-2). CDPHE requires all solid waste be disposed of, treated, or recycled at designated facilities approved by the CDPHE and local jurisdictions. This is the Colorado equivalent to Subtitle D of RCRA.

4.11.2. What is the affected environment?

The project is located in a historically rural area that is currently experiencing limited residential and commercial development. I-76 has existed in this area since the late 1960s. A residential community is located west of the hazardous materials study area, with agricultural land located to the north. Agricultural properties are located east and south of the hazardous materials study area, with light industrial/commercial development, including offices, a storage facility, and a water treatment facility.

Based on the environmental records search conducted for federal, state, and local environmental resources, no hazardous material facilities of concern were identified within the hazardous materials study area. Refer to Appendix F: *Modified Phase I Environmental Site Assessment (MESA) Technical Report* for additional information.

4.11.3. What are the impacts to hazardous materials?

A MESA was conducted in accordance with the CDOT *Hazardous Materials Document Guide* (CDOT, 2011) and follows the ASTM E1527-05, “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process” (Phase I Standard), with the following exceptions: (1) interviews were not conducted, and (2) building interiors were not accessed.

Based on search distances identified in the Phase I Standard, no hazardous materials are located within the hazardous materials study area. Detailed information regarding the review of environmental agency records, historical records, physical setting information, and site reconnaissance were included in the MESA (see Appendix F).

No-Action Alternative

The No-Action Alternative will not directly or indirectly disturb hazardous material sites, since there will be no ground-disturbing activities that could encounter hazardous material sites and no hazardous material sites have been identified within the hazardous materials study area.

Action Alternatives

Hazardous material sites were not identified in the study area; therefore, implementation of any of the three Action Alternatives likely will not encounter hazardous materials. However, ground-disturbing activities during construction both either the interchange or during the installation of the new traffic signal could encounter unknown hazardous materials and disperse soil or groundwater contamination.

The potential to encounter hazardous materials increases with greater area of ground disturbance. The ground disturbance of the three Action Alternatives is similar. Alternative 2 will have the greatest area of ground disturbance: 25,744 square feet (approximately 0.6 acre). The Preferred Alternative will have 15,615 square feet (approximately 0.4 acre) of ground disturbance, and Alternative 3 will have the least amount of ground disturbance: 10,151 square feet (approximately 0.2 acre).

Temporary truck transport along detour routes during construction of the interchange could result in additional spills outside typical transportation routes for all three Action Alternatives. However, any of the Action Alternatives will result in improved safety, decreasing the potential for spills associated with crashes compared to the No-Action Alternative.

Encountering hazardous materials may affect the construction budget and schedule, particularly if previously unidentified contamination is found. Though unlikely within the hazardous materials study area, the acquisition of properties may require additional site investigation and monitoring to evaluate site conditions before and during construction, and construction activities may require the offsite disposal of contaminated soil and debris in permitted facilities.

4.11.4. What are the proposed mitigation measures?

Recommended mitigation measures for potential encounters with unknown hazardous materials include the following:

- Complete ASTM-compliant Phase I Environmental Site Assessment for properties considered for right-of-way acquisition.
- Adhere to CDOT Specification 250—Environmental, Health, and Safety Management by workers onsite during construction activities.
- Adhere to CDOT Specification 250.07—Asbestos-Containing Material (ACM) Management and CDOT Asbestos-Contaminated Soil Management Standard Operating Procedure, in the unlikely event that suspected ACM is encountered. Additionally, depending on the type of ACM, this material also will be abated in accordance with either Section 5.5 of the Solid Waste Regulations, or Regulation No. 8 of the Air Quality Control Commission Regulations.
- Prepare and implement site-specific health and safety plans and material management plans to address potential hazardous materials that are encountered during construction. These plans will consist of specific measures to protect worker and public health and safety, as well as programs to manage contaminated materials during construction.
- Implement standard construction measures for fugitive dust control, as well as stormwater erosion and sediment controls to minimize the spread of potentially contaminated soil.
- Stop work in the event that unknown contaminated media is encountered during construction until the contamination is properly evaluated and measures developed to protect worker health and safety.
- Obtain any necessary permits if dewatering of contaminated groundwater occurs during construction. Contained water will either be treated and discharged onsite or characterized and removed offsite to a permitted disposal facility.
- Properly close wells or septic systems disturbed (if any) during construction activities in accordance with applicable regulations and guidelines.

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4.12 Historic Properties

Historic properties are individual sites, districts, buildings, structures, or objects, generally 50 years of age or older, that are listed or eligible for listing on the National Register of Historic Places (NRHP). Archaeological sites can be historic or prehistoric and include remains of past cultures.

An area of potential effects (APE) was created that includes the area in which it could be reasonably expected that the proposed undertaking has the potential to directly or indirectly cause alterations to the character-defining elements of historic properties. The APE for historic resources encompassed, and was larger than, the construction envelope, whereas the APE for archaeological resources was limited to the proposed construction envelope proper. Appendix G contains documentation of the efforts between CDOT and the State Historic Preservation Office (SHPO).

4.12.1. What is the regulatory environment?

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, outlines the process that federal agencies must follow when their actions have the potential to affect historic properties. It also requires consultation with the SHPO, Tribal Historic Preservation Officers, and Native American tribes.

Historic resources are those that are listed or may be eligible for inclusion on the NRHP. Resources qualifying for the NRHP must retain sufficient integrity (of location, design, setting, materials, workmanship, feeling, and association) and:

- A. Be associated with events that have made a significant contribution to the broad patterns of our history;
- B. Be associated with the lives of persons significant in our past;
- C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. Have yielded, or may be likely to yield, information important in prehistory or history.

In addition, Section 101(d)(6)(B) of the NHPA requires that federal agencies consult with any Native American tribe that attaches religious and cultural significance to historic properties that may be affected by the project. This requirement applies regardless of the location of the historic property. Per 36 CFR 800.2[c][2][ii][a], federal agencies must provide tribes with a reasonable opportunity to:

- Identify their concerns about historic properties;
- Advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance;
- Articulate their views on the undertaking's effects on such properties; and
- Participate in the resolution of adverse effects.

Consultation with a Native American tribe recognizes the unique government-to-government relationship between the federal government and Native American tribes. Federal agencies must be sensitive to the fact that historic properties of religious and/or cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands beyond modern reservation boundaries (36 CFR 800.2[c][2][ii][d]).

4.12.2. What is the affected environment?

No archaeological resources were identified within the project archaeological APE. Historic resources include the Speer Canal (5AM515), the West Burlington Extension Ditch Canal Culvert (5AM1397), the historic West Burlington Extension Ditch (5AM519.2), and a ranch-style house (21955 E. 160th Avenue) (5AM3125). The Bridge Street bridge (CDOT Number E-18-AO) was constructed in 1986 and is not yet 50 years old, thus it was not evaluated for the purposes of Section 106 (see Exhibit 4.12-1). Details below summarize the NRHP eligibility status for the four identified resources; additional information can be found in Appendix G.

Speer Canal (5AM515):

The Speer Canal (5AM515) was realigned and constructed in 2000. The Canal and the West Burlington Ditch cross each other and are separated by a siphon within the APE (see Exhibit 4.12-1). It is not eligible for the NRHP because it is not old enough.

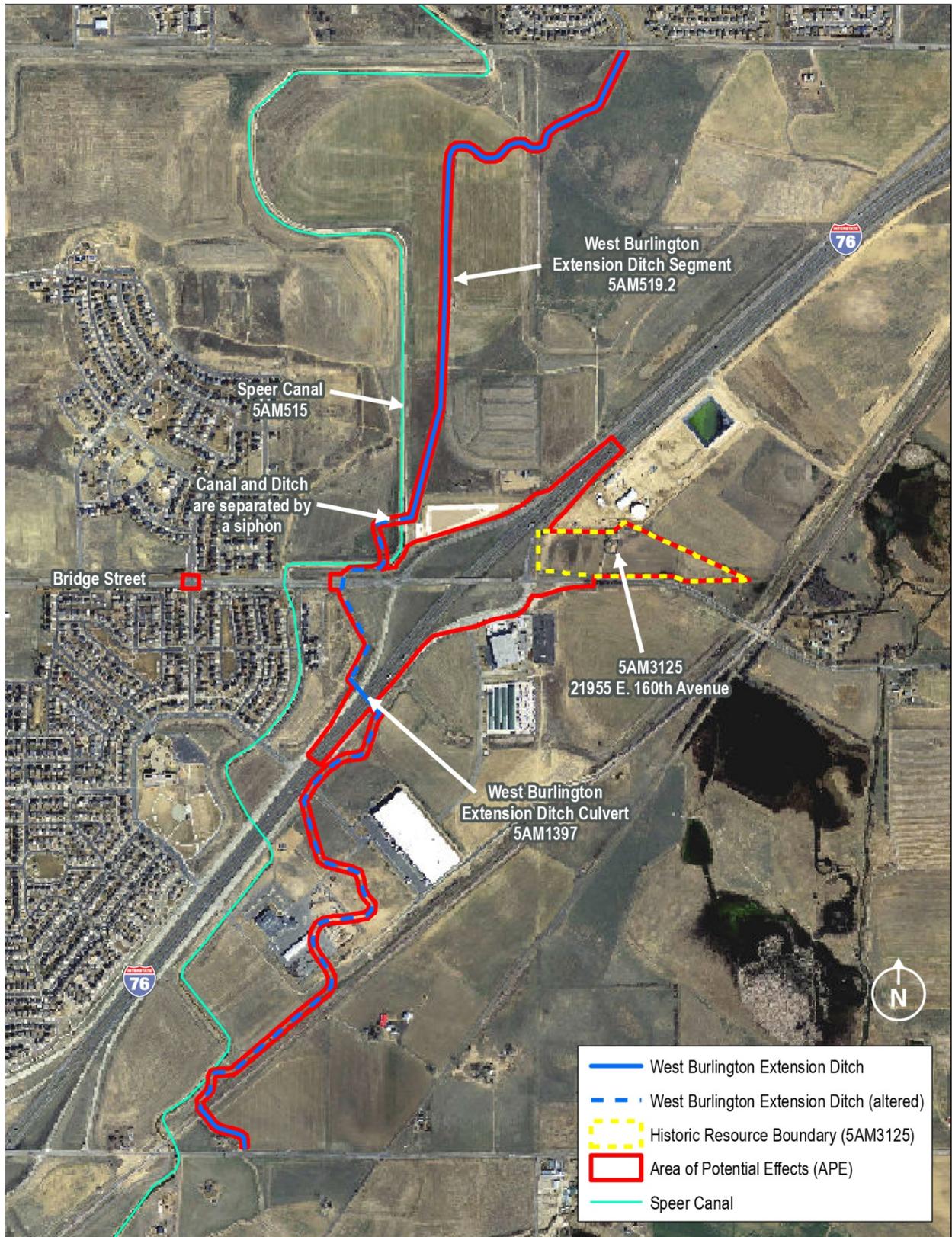
West Burlington Canal Culvert (5AM1397):

In 2002, as a part of the Colorado State Bridge survey, the West Burlington Canal Culvert (5AM1397) was officially determined not to be eligible.

21955 East 160th Avenue (5AM3125):

The property at 21955 East 60th Avenue, including the ranch-style house, was determined not to be eligible as part of the consultation with the State Historic Preservation Officer regarding this project.

Exhibit 4.12-1 Historic Properties Study Area and APE



West Burlington Extension Ditch (5AM519.2):

In 1988, the overall resource of the West Burlington Extension Ditch was determined not to be eligible. However, because this resource was documented twenty-six (26) years ago and there have been changes to the evaluation of linear resources since then, the entire ditch was re-evaluated for this project. Due to its association with the Standley Lake Irrigation System, which is operated by the Farmer's Reservoir Irrigation Company (FRICO), the overall resource is being treated as eligible to the NRHP for the purposes of Section 106. Segment 5AM519.2 does not retain integrity and does not support the overall eligibility of the entire ditch.

Native American Consultation

In January 2014, FHWA contacted the following twelve federally recognized tribes with an established interest in Adams County, Colorado, and invited them to participate as consulting parties:

- Comanche Nation of Oklahoma
- Cheyenne and Arapaho Tribes of Oklahoma
- Cheyenne River Sioux Tribe
- Apache Tribe of Oklahoma
- Crow Creek Sioux Tribe
- Kiowa Tribe of Oklahoma
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Oglala Sioux Tribe
- Pawnee Nation of Oklahoma
- Rosebud Sioux Tribe
- Standing Rock Sioux Tribe

FHWA offered to initiate formal consultation with each tribe, under the provisions of Section 106. FHWA invited each tribe to identify traditional cultural and religious sites within the APE, evaluate the significance of these sites, and indicate how this project might affect them. Should the project impact historic properties of religious or cultural significance to tribes, those tribes were invited to participate in deciding how best to avoid, minimize, or mitigate such impacts.

To date, other than the Comanche Nation of Oklahoma, none of the other tribes have responded; the Comanche Nation indicated in a letter included in Appendix G: *Agency*

Consultation Documentation, that there are no properties that are NRHP eligible in the APE.

4.12.3. What are the impacts to archaeological and historic resources?

There are no known archaeological sites in the archaeological APE; as such, there are no anticipated impacts to these resources.

West Burlington Extension Ditch Segment (5AM519.2)

The resource is located in the APE; however, no part of the ditch will be disturbed during construction. A new visual element—the highway on and off ramps—will be introduced; however, the segment in this area has been completely destroyed, so new visual elements will not impact the segment. Because the subject segment was determined non-supporting of the eligibility of the overall resource, the project will result in a finding of no adverse effect with regard to the resource 5AM519, including segment 5AM519.2.

21955 East 160th Avenue (5AM3125):

The property, including the ranch-style house, is located adjacent to the proposed interchange to I-76 within the APE. All three Action Alternatives include the acquisition of property from the western portion of the property as well as the acquisition of a temporary easement for construction staging. Below in Exhibit 4.12-2 are the acres of property acquisitions for each alternative for the property.

Exhibit 4.12-2 Acres of Property Acquisition

Alternative	Permanent Acquisition	Temporary Easement
Preferred Alternative	990.66 sq ft	765.99 sq ft
Alternative 2	155.00 sq ft	378.00 sq ft
Alternative 3	155.09 sq ft	380.29 sq ft

The ranch-style house on the property is located approximately 645 feet from the alternative with the largest right-of-way acquisition (Preferred Alternative) and will not be directly impacted by the construction. The construction of I-76 required temporary easements on the property in 1956, 1976, and 2004, so the resource property has already had changes to its setting from previous highway construction.

A new interchange at this location will introduce new visual elements. Although the introduction of a new highway interchange somewhat changes the visual appearance, there are no changes to the current overpass and the new visual element will be negligible. While these are changes, they are alterations that will occur in areas of the property already impacted by modern alterations. In addition, the resource was determined to be not eligible for the NRHP, so CDOT has made a finding of no historic properties affected related to the project and any potential impacts to this resource.

4.12.4. What are the proposed mitigation measures?

Mitigation for historic resources is not required since there were no permanent adverse effects to historic resources.

When construction begins, if any subsurface archaeological materials are encountered (artifacts including, but not limited to, historic debris such as bottles, dishware, household or industrial items; prehistoric stone tools, such as projectile points or other flaked stone items; or historic or prehistoric features, such as foundations, stone wall remains, and hearths), work will be halted in the vicinity of the find immediately, and the CDOT Senior Archaeologist will be promptly notified.

The site of the materials encountered—the “find”—will be secured and work will remain halted until the discovery can be evaluated and/or removed by a qualified professional archaeologist. If warranted, additional archaeological testing or data recovery may be necessary before work can be resumed in the vicinity of the find. If bones of potential human origin are encountered during construction, ground-disturbing work must be stopped in the vicinity of the discovery, and the Adams County Sheriff, the Colorado State Archaeologist, and the CDOT Senior Archaeologist will be promptly notified. Work cannot resume in the vicinity of the find until clearance is granted.

4.13 Cumulative Impacts

Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes the action (CEQ, 40 CFR 1500–1508). CEQ recommends that cumulative impact analyses examine resources that could be affected by the action(s) under investigation. Therefore, not all resource areas are evaluated in this section; only those for which permanent impacts are anticipated to result from the implementation of the any of the Action Alternatives are examined in this EA.

The resources that were evaluated for cumulative impacts as a part of this EA are:

- Transportation
- Land Use
- Right of Way, Relocations, and Acquisitions
- Biological Resources
- Wetlands
- Water Resources and Water Quality

For the purpose of the cumulative impacts assessment, the three Action Alternatives studied in the EA are addressed as one alternative. The difference in right of way impacts is negligible, at only 0.35 acre of impacted land, and there are no differences in impacts to the other resources under evaluation for cumulative effects.

4.13.1. What is the regulatory environment?

CEQ's regulations require the consideration of cumulative impacts in NEPA documents (CEQ, 1997). There are several supporting guidance documents, including:

- FHWA: *Secondary and Cumulative Impact Assessment in the Highway Project Development Process*
- CEQ: *Considering Cumulative Effects under NEPA*
- CEQ: *Regulations Implementing NEPA*
- EPA: *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*

4.13.2. What is the timeframe for analysis?

To assess cumulative impacts, a period of time for which impacts have occurred or may occur must be established. This duration should be long enough to allow for identification of trends and short enough to be meaningful. For transportation projects, a period of 20 to 30 years into the future is commonly used, as it matches the long-term transportation planning horizon of most states. In establishing a time in the past as a beginning point for

examining changes to resources of interest, factors such as potential large or “tipping point” changes in resources—including land use, development, or key events, as well as the availability of data from which to establish a baseline—are considered. For this cumulative impacts assessment, the following timeframes were established:

- The analysis extends back to the mid-1960s based on when the planning for I-76 was underway and when photographic imagery for the cumulative study area was readily available.
- The analysis extends forward to 2035. This corresponds to the design horizon used for regional transportation planning.

Thus, the timeframe for cumulative impacts analysis for the I-76 and Bridge Street Interchange EA extends from approximately 1960 to approximately 2035; a span of 75 years.

4.13.3. What is the cumulative study area for the analysis?

The study area for cumulative impacts is roughly one half-mile centered on the Bridge Street overpass. This encompasses the transportation facilities that may be directly or indirectly impacted by implementation of an Action Alternative. It also includes the existing and planned developments that are in or adjacent to the construction envelope.

4.13.4. What were the past actions that affected resources in this cumulative impact assessment?

I-76 is a critical link in the U.S. transportation system because it connects to I-80 and I-70, two of the longest interstate routes in the nation. Construction of I-76 technically began in 1958 (CDOT, 2014). However, the majority of the construction kicked off in the mid-1960s. Until 1975, both the western segment of I-76 and a portion of eastern I-76 were signed as Interstate 80S (I-80S). In July 1976, I-80S was renumbered and signed to I-76 in accordance with American Association of State Highway and Transportation Officials (AASHTO) policy to remove the letter suffixes from interstate routes and to avoid the confusion of this route with Interstate 80.

The section of I-76 that passes through the cumulative study area was upgraded to an interstate in 1966. Since the 1980s, residential, industrial, and commercial development in the Brighton area has been increasing. Development immediately surrounding the cumulative study area did not start until the early 2000s with the Bromley Park residential development to the southwest, and the Brighton Crossing residential development beginning shortly thereafter to the northwest. It was during this time that the Speer Canal was re-aligned to its current position and the West Burlington Extension Ditch was altered through the cumulative study area. Exhibit 4.13-1 through Exhibit 4.13-6 illustrate the development of the cumulative study area during the following years: 1964, 1978, 1988, 1999, 2002, and 2011.

As shown in Exhibit 4.13-1, there are only a few farmsteads in the cumulative study area and immediate vicinity in 1964. There is a road along the current Bridge Street alignment, as well as the alignment that will become I-80S and ultimately I-76.

No development or changes in land use occurred between 1964 and 1978, as illustrated in Exhibit 4.13-2.

Between 1978 and 1988, the transportation system evolved to include frontage roads along I-76 and a grade separation between I-76 and Bridge Street. It appears that land in the area may have been further divided into smaller parcels as shown in Exhibit 4.13-3, although it was still used for agricultural purposes.

Land use in the cumulative study area and vicinity remained agricultural through 1999, as shown in Exhibit 4.13-4.

By 2002, development in the form of a residential community on the west and commercial/industrial land uses on the east has occurred as shown in Exhibit 4.13-5.

By 2011, the aerial photography, shown in Exhibit 4.13-6, shows increased residential development and commercial activity. In addition, it appears that a median was filled in between the northbound and southbound lanes.

Exhibit 4.13-1. Study Area—1964



Aerial Source: EDR, 2013

Exhibit 4.13-2. Study Area—1978



Aerial Source: EDR, 2013

Exhibit 4.13-3. Study Area—1988



Aerial Source: EDR, 2013

Exhibit 4.13-4. Study Area—1999



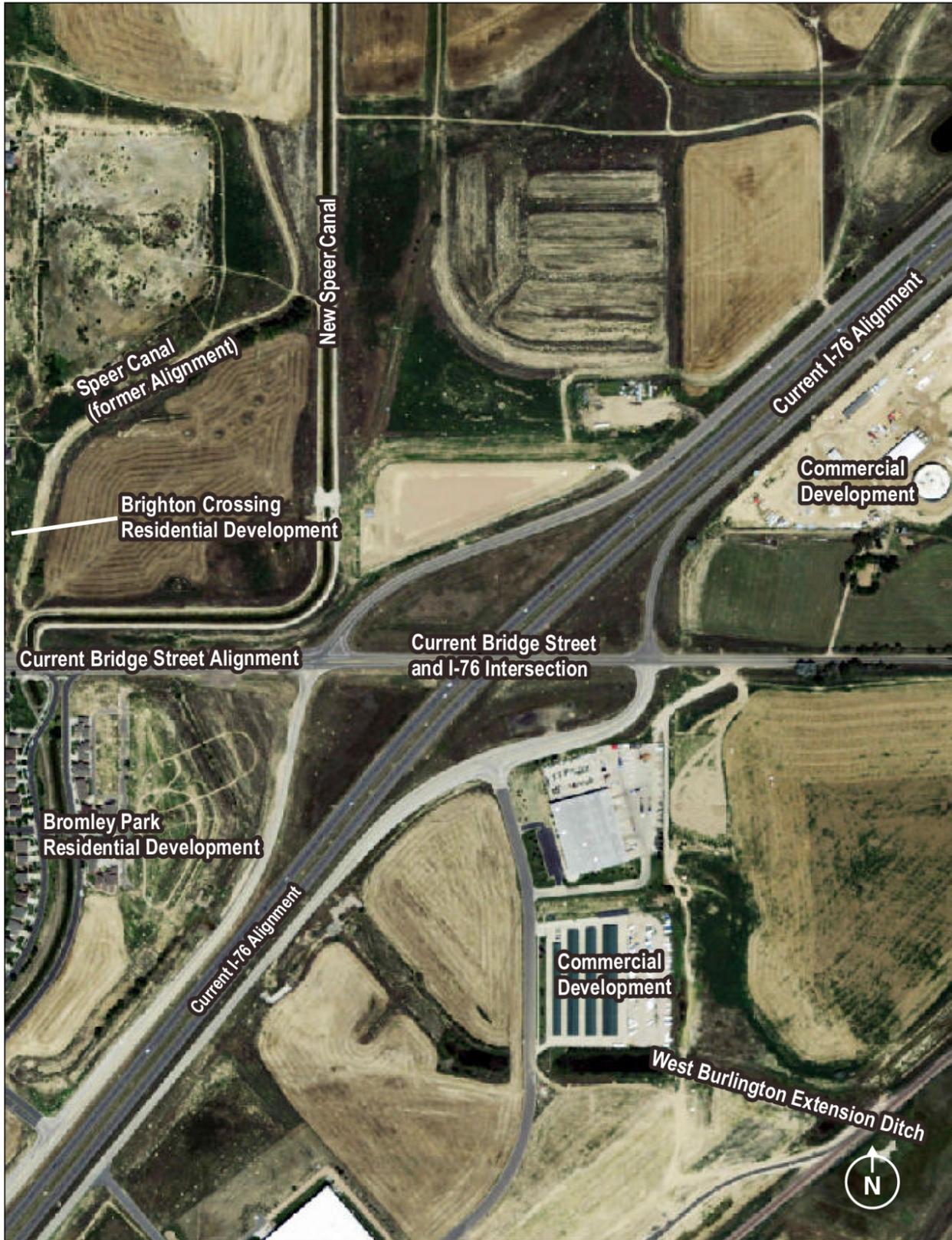
Aerial Source: EDR, 2013

Exhibit 4.13-5. Study Area—2002



Aerial Source: EDR, 2013

Exhibit 4.13-6. Study Area—2011



Aerial Source: EDR, 2013

4.13.5. What are the present actions that affect resources in this cumulative impact assessment?

Recent developments in the cumulative study area include approval by Brighton for the development of two residential subdivisions: Bromley Park and Brighton Crossing (see Exhibit 4.13-7). In addition, a third subdivision, Brighton East Farms, has been preliminarily platted, but remains undeveloped; it is a reasonably foreseeable future action (see Exhibit 4.13-7). The most recent development in the area, the Northern Water Treatment Plant to the northeast, was constructed in 2012.

4.13.6. What are the reasonably foreseeable future actions that are anticipated to affect resources in this cumulative impact assessment?

As mentioned above, residential development is occurring in the cumulative study area and, as part of this growth, Brighton plans to require the developer to build sidewalks (see Exhibit 4.13-8). Details of each development are listed below.

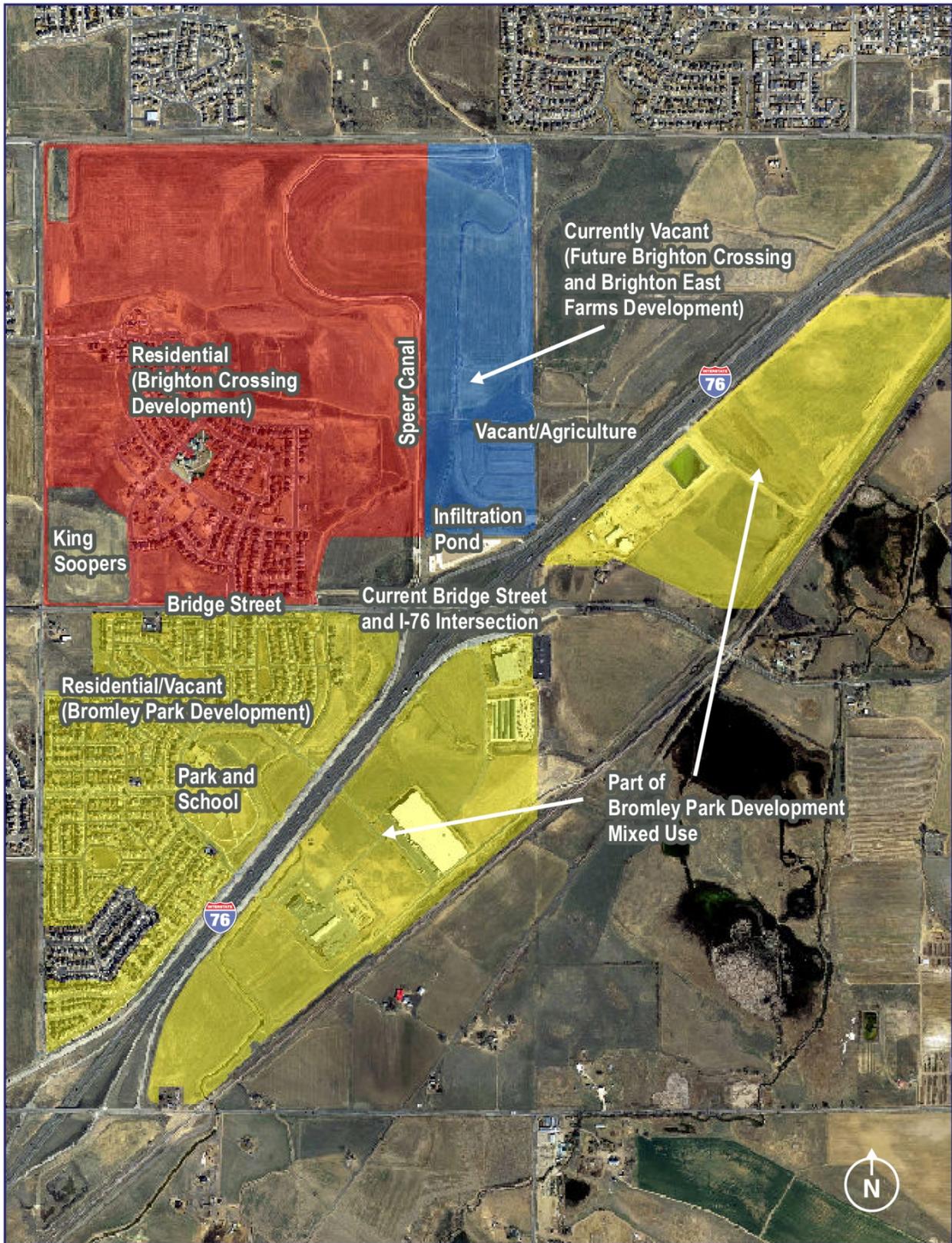
- **Bromley Park (south of Bridge Street, west of I-76):** Currently, this development is platted; however, only the configured portion has been developed. It is zoned single-family residential and will cover approximately 11 acres at full build-out. Development is anticipated soon; however, full plans have not yet been submitted to Brighton for approval.
- **Brighton East Farms (north of Bridge Street, west of I-76):** This area has been preliminarily platted only. It will be approximately 581 acres at full build-out.
- **Brighton Crossing (just west of Brighton East Farms):** This development has been mostly built out; however, some additional development is anticipated. At full build-out, it will cover approximately 434 acres encompassing more than 3,000 homes, townhomes, condominiums, and apartments. It also will include a King Soopers grocery store at the northeast corner of Bridge Street and North 50th Avenue, which is nearing completion.

Exhibit 4.13-7. Study Area—Current and Planned Land Uses (2014)



Aerial Source: ESRI, 2014

Exhibit 4.13-8 Study Area—Future



Aerial Source: ESRI, 2014

4.13.7. What are the cumulative impacts of the Action Alternatives?

The impacts from the other past, present, and reasonably foreseeable future actions listed above when combined with the impacts expected under any of the Action Alternatives are described below by resource.

Transportation

Major infrastructure was built in the 1960s and 1970s with the development of I-76. Minor improvements to local streets followed and supported the slow growth and land use changes in the area. As Brighton transforms from a rural, agricultural town into a suburban community, demands are being placed on the existing transportation network.

Transportation resources in the cumulative study area are becoming more congested due to increasing population and changes in land use. There are interchanges at both Bromley Lane and Baseline Road on I-76, but no direct access from Bridge Street. There are three transportation projects currently planned for the cumulative study area: the new interchange at I-76 and Bridge Street and two proposed trails (Bridge Street Trail and I-76 Trail; both are for transportation and recreational uses). The proposed new interchange will improve mobility and reduce congestion and the proposed trails will enhance multimodal connectivity. Implementation of either one of the trails is independent of the interchange construction and is not affected by any of the alternatives. Additional information on the transportation network can be found in Section 4.1 of this EA.

When combined with other past, present, and reasonably foreseeable future actions, none of the Action Alternatives are expected to negatively impact transportation resources. This project will improve connectivity, safety, and access in the region. Overall, this will improve the local roads and the approaches to I-76. However, in general, congestion will continue to increase in the area.

Land Use, Right of Way, Relocations, and Acquisitions

Past and current land uses are primarily agricultural with residential development taking place to the west of I-76 and industrial development occurring to the east. Development has the following effects:

- Reducing wildlife habitat by converting it from its natural state
- Likely reducing wetlands and affecting waters of the U.S. in the process
- Increasing the prevalence of noxious weeds

Development has added to the amount of impervious surface, increasing runoff that can negatively affect water quality. Construction of transportation facilities in the cumulative study area also has contributed to these effects. However, these impacts have been limited in the study area due to the low density of development to date.

Urbanization and development of large portions of the cumulative study area also have not fully occurred yet. In the future, much of the currently undeveloped land within the study area will be developed in accordance with Brighton's approved zoning and future planned growth. The acquisition of right of way by any of the Action Alternatives and conversion of small amounts of land to a transportation use will not have long-term cumulative impacts on land use within the cumulative study area. Additional information on land use, right of way, and relocations, and acquisitions can be found in Sections 4.4 and 4.5 of this EA.

When combined with other past, present, and reasonably foreseeable future actions, none of the Action Alternatives are expected to negatively impact land use or right of way. The Action Alternatives support the planned land uses in the area. However, due to continued development and an increase in the rate of conversion, it is expected that undeveloped land will decrease over time.

Biological Resources

Past uses of the cumulative study area—primarily agricultural uses and urbanization—have altered the habitat for many native species. This project will impact a small amount (approximately 0.2 acre under the Preferred Alternative) of roadside land that is not ideal habitat for wildlife. The study area does not include habitat for state-listed or federally listed threatened or endangered species, although there is the potential for species downstream in the Platte River to be impacted. These potential impacts are mitigated through the SPWRP.

Continued development has the effect of further reducing wildlife habitat by converting it from its natural state and increasing the prevalence of noxious weeds. Proposed development will further reduce the amount of habitat available for use by wildlife within the cumulative study area—primarily migratory birds. The continued urbanization and conversion of agricultural will degraded will degrade and reduce available habitat in the future. Noxious weeds may be spread through implementation of this and other reasonably foreseeable projects. However, BMPs will be used to minimize this impact. Additional information on biological resources can be found in Section 4.8 of this EA.

The contribution of impacts to biological resources from any of the Action Alternatives is small after the implementation of BMPs and mitigation measures. However, continued development is expected to reduce natural areas and habitat.

Wetlands and Open Waters

Historically, development has led to a cumulative loss of wetlands in the vicinity of the project. Planned development in the vicinity may continue to reduce the acreage and quality of wetlands. However, through mitigation of the small wetland zone impacted by this project, no net loss to wetlands will occur in the watershed due to the construction of a new interchange at Bridge Street and I-76. Impacts to jurisdictional wetlands associated with planned development will be offset by BMPs and mitigation; however, mitigation is

not required for non-jurisdictional wetland and due to land use changes an overall reduction in wetlands is expected. Additional information on wetlands and WUS can be found in Section 4.9 of this EA.

When combined with other past, present, and reasonably foreseeable future actions, the Action Alternatives are not expected to negatively impact wetlands and open waters.

Water Quality

Although historically an agricultural area, development has added to the amount of impervious surface over time, increasing runoff from impervious surfaces; this can negatively affect water quality. Construction of the transportation system has contributed to the increase in impervious surface. Development will increase the amount of impervious surface, which, in turn, could increase runoff that can negatively affect water quality. However, with new standards, BMPs, and mitigation methods required for development by Brighton, these effects will be less than previously incurred. Additional information on water quality can be found in Section 4.10 of this EA.

The construction of any of the three Action Alternatives will add impervious surface and will result in additional runoff. However, requirements to comply with local, state, and federal stormwater regulations will control and minimize the impacts of this and future development. The project will result in a negligible increase of impervious surface when added to existing and future development in the cumulative study area and will improve water quality above existing conditions as there are currently no BMPs for run-off from the Bridge Street and I-76 intersection. When combined with other past, present, and reasonably foreseeable future actions, none of the Action Alternatives are expected to negatively impact water quality.

Conclusion

Continued development in Brighton and the County are expected to change the character of the area. The impacts of this project when added to the past, present, and reasonably foreseeable future development in the cumulative study area will not result in major cumulative impacts to the key resources evaluated after mitigation of the direct impacts of the project is completed.

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4.14 Summary of Impacts and Mitigation for the Preferred Alternative

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
1	Air Quality	Fugitive road dust and engine exhaust emissions during construction activities	<p>Since construction of the project will require submittal of an Air Pollution Emission Notice and Application for Construction Permit from the APCD, preparation of a Fugitive Dust Control Plan will be required.</p> <p>Construction phase air quality impacts (fugitive road dust and engine exhaust emissions) will be controlled by implementing the measures listed below:</p> <ul style="list-style-type: none"> - Wetting exposed soils and soil piles for dust suppression. - Covering trucks hauling soil and other fine materials. - Stabilizing and covering stockpile areas. - Re-vegetating exposed areas. - Minimizing off-site tracking of mud and debris by washing construction equipment and temporary stabilization. - Limiting vehicle speed of construction-related equipment when off road. - Prohibiting unnecessary idling of construction equipment. - Using low-sulfur fuel. - Locating diesel engines and motors as far away as possible from residential areas. - Locating staging areas as far away as possible from residential areas. - Requiring heavy construction equipment to use the cleanest available engines or to be retrofitted with diesel particulate control technology. - Using alternatives for diesel engines and/or diesel fuels (such as: biodiesel, liquefied natural gas, compressed natural gas, fuel cells, or electric engines). - Installing engine pre-heater devices to eliminate unnecessary idling during winter time construction. - Prohibiting tampering with equipment to increase horsepower or to defeat emission control devices effectiveness. - Requiring construction vehicle engines to be properly tuned and 	CDOT Construction Engineering	Prior to and during construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
			maintained. - Using construction vehicles and equipment with the minimum practical engine size for the intended job.		
2	Noise	Construction noise	The following BMPs will be required by the contractor, as applicable: - Use noise blankets on equipment and quiet-use generators - Minimize construction duration in residential areas as much as possible - Minimize night-time activities in residential areas as much as possible - Re-route truck traffic away from residential streets where possible - Combine noisy operations to occur in the same time period Potential BMPs for consideration include: - Eliminate slamming of truck beds, truck tailgates, and equipment buckets - Idle down equipment engines when the equipment is not in immediate use - Maintain all equipment to meet manufacturer's specifications - Schedule trucks properly to minimize long queues - Minimize back-up distances for trucks and other equipment - Install localized noise shielding around compressors and other equipment when in close proximity to residences.	CDOT Design Engineer and Construction Engineer	During Construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
3	Right of Way	Property acquisition	<p>Acquisition:</p> <p>For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, (Uniform Act). The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from Federal or federally assisted programs or projects. It was created to provide for and insure the fair and equitable treatment of all such persons. To further ensure that the provisions contained within this act are applied "uniformly", CDOT requires Uniform Act compliance on any project for which it has oversight responsibility regardless of the funding source. Additionally, the Fifth Amendment of the United States Constitution provides that private property may not be taken for a public use without payment of "just compensation." All impacted owners will be provided notification of the acquiring agency's intent to acquire an interest in their property including a written offer letter of just compensation specifically describing those property interests. A Right of Way Specialist will be assigned to each property owner to assist them with this process.</p> <p>Relocation:</p> <p>In certain situations, it may also be necessary to acquire improvements that are located within a proposed acquisition parcel. In those instances where the improvements are occupied, it becomes necessary to "relocate" those individuals from the subject property (residential or business) to a replacement site. The Uniform Act provides for numerous benefits to these individuals to assist them both financially and with advisory services related to relocating their residence or business operation. Although the benefits available under the Uniform Act are far too numerous and complex to discuss in detail in this document, they are available to both owner occupants and tenants of either residential or business properties. In some situations, only personal property must be moved from the real property and this is also covered under the</p>	CDOT Right-of-Way Specialist	Pre-construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
			relocation program. As soon as feasible, any person scheduled to be displaced shall be furnished with a general written description of the displacing Agency's relocation program which provides at a minimum, detailed information related to eligibility requirements, advisory services and assistance, payments, and the appeal process. It shall also provide notification that the displaced person(s) will not be required to move without at least 90 days advance written notice. For residential relocatees, this notice cannot be provided until a written offer to acquire the subject property has been presented, and at least one comparable replacement dwelling has been made available. Relocation benefits will be provided to all eligible persons regardless of race, color, religion, sex or national origin. Benefits under the Act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail by an assigned Right of Way Specialist.		
4	Socioeconomics	Temporary construction impacts including dust, noise, and coordination with emergency providers	Mitigation measures for temporary impacts related to dust include wetting soils, covering trucks hauling soil and other fine materials, re-vegetating exposed areas, and using low-sulfur fuel. A complete list of air quality BMPs can be found in Section 4.2 of this EA. BMPs for noise impacts include the implementation of best management practices including using noise blankets and quiet-use generators, minimizing construction duration and construction proximity to residences at night, and re-routing truck away from residential areas where possible. A complete list of noise-related BMPs can be found in Section 4.3 of this EA. There also will be coordination with the emergency providers prior to construction, signage for all detours, and advance notice to the traveling public of detours and construction.	CDOT Construction Engineer	Before and During Construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
5	Utilities	Potential to impact underground utility lines	<ul style="list-style-type: none"> - Coordinate with utility owners to modify designs to avoid or minimize conflicts. - Minimize service disruptions by connecting to active utilities, and scheduling to coincide with periods of lower demand. - Encase or provide protective cover over any impacted underground utilities. - Coordinate with utility owners and operators to identify construction requirements and financial responsibilities for relocations. - Identify and improve any utility concerns that can be addressed as part of project implementation. - Integrate above-ground utilities that are impacted by the project into the design, hide them from sight within the design, and/or design them to be aesthetically pleasing to the greatest extent practical. - Move above-ground utilities underground to the greatest extent practical. - Relocate many of the utilities within the covered section or in bridge structures. 	CDOT Design Engineer and Construction Engineer	Final Design/ During Construction
6	Biological Resources (Noxious weeds)	Potential spread of noxious weeds within the study area	<p>There are weeds in the study area, but these are relatively few in number and not covering large areas. Therefore, a noxious weed management plan is not recommended. However, during construction, the project is required to minimize the spread of noxious weeds according to the revised Sections 207, 212, and 217 of the CDOT Standard Specifications, and for implementing the standard CDOT Best Management Practices. CDOT has Best Management Practices designed to prevent the spread of noxious weeds, which are:</p> <ul style="list-style-type: none"> - Soil disturbance will be minimized to the extent possible; - Staging of equipment will not be permitted in weed-infested areas; - Weed management efforts will be coordinated with local jurisdictional agencies and adjacent landowners to the extent possible; - Herbicide may be used immediately adjacent to wetlands and/or water bodies only if the label indicates that the use is appropriate for such areas; - All disturbed soil will be re-seeded with a pure live seed 	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	During Construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
			<p>tested for germination and purity within seven days of completion of work during the growing season;</p> <ul style="list-style-type: none"> - "A" horizon soil material currently supporting noxious weed cover of more than 10% will not be used as topsoil during re-vegetation; - Topsoil will not be imported due to the potential for spread of noxious weeds; - All areas treated for noxious weeds during construction will be monitored and re-treated, if necessary, to prevent re-establishment of noxious weeds; and - Any compost used will be Seal of Testing Assurance weed-free. - Weed-free is defined and regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS. 		
7	Biological Resources (Threatened and Endangered Species)	Potential adverse effect to the five downstream species in the Platte River	Mitigation for five federally listed downstream species will follow the PBA/BO mitigation from the SPWRAP.	CDOT Environmental	Ongoing
8	Biological Resources (Migratory Birds)	Potential impacts to songbirds/ ground birds protected under the MBTA	Impacts to birds protected under the MBTA will follow CDOT Specification 240: Protection of Migratory Birds. This generally includes the following.	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	Pre-construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
9	Biological Resources (Migratory Birds)	Potential impacts to songbirds/ ground birds protected under the MBTA	<p><u>Tree and Shrub Removal or Trimming:</u></p> <ul style="list-style-type: none"> - Tree and shrub removal or trimming shall occur before April 1 or after August 31 if possible. If tree and shrub removal or trimming will occur between April 1 and August 31, a survey for active nests will be conducted by a biologist within the seven days immediately prior to the beginning of work in each area or phase of tree and shrub removal or trimming. The Contractor shall notify the Engineer at least ten working days in advance of the need for a biologist to perform the survey. - If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest shall remain undisturbed and protected until the nest becomes inactive. The nest shall be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate by a biologist and approved by the Engineer. Work shall not proceed within the fenced buffer area until the young have fledged or the nests have become inactive. - If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time. 	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	Pre-construction
10	Biological Resources (Migratory Birds)	Potential impacts to songbirds/ground birds protected under the MBTA	<p><u>Grasses and Other Vegetation Management:</u></p> <ul style="list-style-type: none"> - Due to the potential for encountering ground nesting birds' habitat, if work occurs between April 1 and August 31, the area shall be surveyed by a biologist within the seven days immediately prior to ground disturbing activities. The Contractor shall notify the Engineer at least ten working days in advance of the need for a biologist to perform the survey. - The undisturbed ground cover to 50 feet beyond the planned disturbance, or to the right-of-way line, whichever is less, shall be maintained at a height of 6 inches or less beginning April 1 and continuing until August 31 or until the end of ground disturbance work, whichever comes first. - If birds establish a nest within the survey area, an appropriate 	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	Pre-construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
			<p>buffer of 50 feet will be established around the nest by a biologist. This buffer dimension may be changed if determined appropriate by a biologist and approved by the Engineer. The Contractor shall install fence (plastic) at the perimeter of the buffer. Work shall not proceed within the buffer until the young have fledged or the nests have become inactive.</p> <ul style="list-style-type: none"> - If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time. 		
11	Biological Resources (Migratory Birds)	Potential impacts to songbirds/ ground birds protected under the MBTA	<p>Work on Structures:</p> <ul style="list-style-type: none"> - The Contractor shall prosecute work on structures in a manner that does not result in a taking of migratory birds protected by the MBTA. The Contractor shall not prosecute the work on structures during the primary breeding season, April 1 through August 31, unless he takes the following actions: <ol style="list-style-type: none"> 1. The Contractor shall remove existing nests prior to April 1. If the Contract is not awarded prior to April 1 and a biologist has removed existing nests, then the monitoring of nest building shall become the Contractor's responsibility upon the Notice to Proceed. 2. During the time that the birds are trying to build or occupy their nests, between April 1 and August 31, the Contractor shall monitor the structures at least once every three days for any nesting activity. 3. If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters. 4. Installation of netting may be used to prevent nest building. The netting shall be monitored and repaired or replaced as needed. Netting shall consist of a mesh with openings that are ¾ inch by ¾ inch or less. 	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	Pre-construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
12	Biological Resources (Migratory Birds)	Potential impact to raptors protected under the MBTA	Pre-construction surveys for nesting raptors in accordance with CPW's Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors guidelines for pre-construction surveys (See Appendix C of the Biological Resources Technical Memorandum). Impacts to raptors identified will follow CPW's Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors guidelines (See Appendix C of the Biological Resources Technical Memorandum).	CDOT Environmental	Pre-construction
13	Wetlands and Waters of the US	There would be 0.01 acre (585 square feet) of permanent impacts to WL-01.	CDOT requires that all wetlands be mitigated, regardless of USACE jurisdiction. Additionally, provisions in NEPA also may require non-jurisdictional wetlands, open waters, or other aquatic features to be mitigated. On-site mitigation will result in a costly and time-consuming process, with no guarantee of the establishment of a successful wetland habitat. One option is for the project to purchase credits from a wetland mitigation bank. Three USACE-approved banks are located within the same watershed as the project, including the Middle South Platte, Mile High, and Riverdale Wetland Mitigation Banks. If credits are purchased, they would likely be purchased from one of these three banks.	CDOT Environmental	Pre-construction
14	Wetlands and Waters of the US	Temporary impacts could result from construction activities related to implementation of the Preferred Alternative. Construction activities disturb the ground, which increases	These temporary impacts will be minimized by the implementation of a Stormwater Management Plan (SWMP). Construction activities disturb the ground, which increases the likelihood of noxious weeds becoming established. This will be minimized by re-seeding upland and wetland areas disturbed by construction with native species in accordance with Sections 207, 212, and 217 of the CDOT Standard Specifications, and for implementing the standard CDOT Best Management Practices (BMPs).	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	During Construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
		the likelihood of noxious weeds becoming established.			
15	Water Resources and Water Quality	Direct and temporary impacts to surface waters and groundwater.	<p>In compliance with CDOT's MS4 permit, the following guidance documents will be utilized: 1) CDOT Erosion Control and Stormwater Quality Guide (updated 2002); CDOT Drainage Design Manual (updated 2004); and CDOT Standard Specifications for Road and Bridge Construction (last updated 2011).</p> <p>Under CDOT's current MS4 permit, 100 percent water capture and treatment for new impervious surfaces and resurfaced areas is required. To comply with this requirement, the following design elements have been included in the Action Alternatives: rundowns at each bridge abutment, grass-lined swales, curb and gutter with inlets, and a water quality pond which will be built in the southwest quadrant of the interchange. Regulations and guidance that are current at the time of final design and construction will be followed for this project.</p>	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	Final Design
16	Water Resources and Water Quality	Construction impacts to water resources	Best management practices from the Erosion Control and Stormwater Quality Guide will be utilized during construction to reduce construction-related and/or long-term operation impacts to water resources and water quality as appropriate (CDOT, 2002) including development of a SWMP.	CDOT Environmental, CDOT Design Engineer, and CDOT Construction Engineer	During Construction
17	Hazardous Materials	Acquisition of Right of Way	Complete ASTM-compliant Phase I Environmental Site Assessment for properties considered for right-of-way acquisition.	CDOT Environmental	Pre-construction

Mitigation Commitment #	Mitigation Category	Impact from NEPA Document	Mitigation Commitment	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
18	Hazardous Materials	Potential to encounter hazardous materials	<ul style="list-style-type: none"> - Obtain any necessary permits if dewatering of contaminated groundwater occurs during construction. Contained water will either be treated and discharged onsite or characterized and removed offsite to a permitted disposal facility. Proper closure of wells or septic systems disturbed (if any) during construction activities in accordance with applicable regulations and guidelines. - Preparation and implementation of site-specific health and safety plans and material management plans to address potential hazardous materials that are encountered during construction. These plans will consist of specific measures to protect worker and public health and safety, as well as programs to manage contaminated materials during construction. - Implementation of standard construction measures for fugitive dust control, as well as stormwater erosion and sediment controls to minimize the spread of potentially contaminated soil. - Adhere to CDOT Specification 250 – Environmental, Health, and Safety Management by workers onsite during construction activities. - Stop of work in the event that unknown contaminated media is encountered during construction until the contamination is properly evaluated and measures developed to protect worker health and safety. 	CDOT Construction Engineer	Pre-construction and During construction
19	Hazardous Materials	Potential to encounter ACM	Adhere to CDOT Specification 250.07 – Asbestos-Containing Material (ACM) Management and CDOT Asbestos-Contaminated Soil Management Standard Operating Procedure, in the unlikely event that suspected ACM is encountered. Additionally, depending on the type of ACM, this material will also be abated in accordance with either Section 5.5 of the Solid Waste Regulations, or Regulation No. 8 of the Air Quality Control Commission Regulations.	CDOT Construction Engineer	During construction
20	Transportation	Construction impacts to transportation	<ul style="list-style-type: none"> - Follow applicable standards regarding traffic control, road closures, and detours due to construction - Coordinate with transit agencies if service disruptions are anticipated to any routes due to construction activities 	CDOT Design Engineer, and CDOT Construction Engineer	During construction

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Chapter 5: Agency Collaboration and Public Involvement

This chapter describes the communication and coordination that has occurred with stakeholders during the EA process. Coordination with stakeholders focused on gathering input on interchange area issues and alternatives, as well proactive, open communication with potentially affected property owners and agency representatives.

5.1 Goals of Agency Collaboration and Public Involvement

Per the CDOT *NEPA Manual*, “Public involvement is a process by which the influence of various stakeholders is organized in relationship to decision making ...” (CDOT, 2013). The overall goal of the agency collaboration and public involvement process is to solicit input through a transparent, open, and dynamic process that includes community members, businesses, agencies, and stakeholders. This process helps the project team identify and document any issues, suggestions, comments, or concerns and incorporate them in the planning and decision-making process.

5.2 Agency Collaboration

Key agencies partnered throughout this project to identify and address transportation challenges and develop implementable solutions that meet the project Purpose and Need while aligning with the public and stakeholders’ expectations. Agencies and their associated roles and responsibilities are as follows:

- **Brighton:** Project Proponent; responsible for the overall project, funding, construction, and maintenance
- **CDOT:** Joint Lead Agency; responsible for guiding the EA document development and engineering design elements; the Colorado Transportation Commission (CTC) makes a decision for approval based on the 1601 requirements
- **FHWA:** Joint Lead Agency; responsible for oversight of the NEPA process and approval authority

A charter document was developed when the project started to provide a clear description of the interagency team’s purpose and identify their responsibilities during the planning, design, and approval of the project. The executed charter document is included in Appendix H: *Outreach and Support Documentation*.

The project team members from the collaborative agencies met once a month throughout the study to address issues and concerns, participate in collaborative discussions, and consider comments from the community members, businesses, and stakeholders.

5.3 Other Agency Coordination

The project team consulted with DRCOG for guidance on the Plan Amendment Cycle and associated schedule. As the lead agency for regional transportation planning, DRCOG prepares transportation plans and programs associated with improving air quality. DRCOG is required to show air quality conformity of its fiscally constrained RTP and TIP with the SIP before these plans and programs are adopted. DRCOG has approval authority for inclusion in the RTP.

In addition, pursuant to Section 106 requirements, the project team coordinated with SHPO for concurrence on Determinations of Eligibility and Effects for the project.

5.4 Public Involvement

Several strategies to engage the community are used to create an ongoing dialogue about the project with different ways to distribute and collect feedback.

5.4.1 Project Webpage

Brighton has developed a dedicated webpage on their city website to distribute project information and updates. This webpage can be accessed at www.brightonco.gov/605/I-76-and-Bridge-Street-Interchange-Project. The webpage provides updates on the project and an opportunity for the public to submit comments. Public meeting/open house notices are posted on the webpage at least 10 days prior to the meeting. Meeting summaries and materials are available on the webpage after the meetings to provide information to those who could not attend the meeting in person.

5.4.2 Public Open House

A public open house was conducted on July 31, 2013, from 4:00 p.m. to 7:00 p.m. at the Brighton Armory located at 300 Strong Street, Brighton, CO 80601, to introduce the project to the general public and stakeholders and solicit input on the proposed alternatives. The open house format of this meeting allowed for the public to arrive and leave at their convenience and have an opportunity to speak to project team members individually or in groups. Project team members—who consisted of members of the consultant team, Brighton staff, and representatives from CDOT and FHWA—were available at the meeting to discuss the project and answer any questions. The public was invited to the open house through Brighton's website and press releases. Meeting notices also were mailed to more than 300 recipients in the project area. The project has generated little interest and no controversy among the public.

Community members and I-76 commuters who attended the open house generally were more supportive of the roundabout alternatives than other interchange configurations.

5.4.3 Design Focus Group

As the alternatives were refined, key stakeholders were contacted for input on the design. A focus group was formed, including local representatives from the school district, parks and recreation department, emergency response, and police department. This focus group met on March 4, 2014, to review the design options that had been developed thus far and discuss any fatal flaws, concerns, or ideas based on their expertise. The key outcomes of this meeting are listed below:

- Providing adequate signage in the roundabouts was proposed as a way to improve efficiency
- The Preferred Alternative design was supported by the group as a way to help relieve traffic at the I-76 and Bromley Lane roundabout during peak hours
- The school district will adjust their routes to take advantage of the proposed interchange to access the bus garage located along Bridge Street more efficiently
- The design should accommodate a crossing at Bridge Street to accommodate future bicycle and pedestrian traffic
- Decorative landscaping or lighting is desired in the final design of the roundabouts

5.4.4 Elected Officials Outreach

Before making major project decisions, the project team met with elected officials on a regular basis to brief them on project progress and recommendations. One working session on July 9, 2013, was conducted with elected officials of the City Council to provide information and updates on the project, answer questions, and solicit input on the recommended alternatives. The workshops were open to the public and included presentations followed by a question-and-answer session.

A presentation also was made to the Brighton City Council on May 13, 2014, at 6:00 p.m. The purpose of this presentation was to update the City Council regarding the project schedule, Preferred Alternative, impacts, and costs, and to solicit input before the EA was published.

5.5 Reaction to the Preferred Alternative

The project received a letter from CDOT, a collaborating and a joint lead agency (available in Appendix H: *Outreach and Support Documentation*), in support for the Two-Roundabout Alternative as the Preferred Alternative for the following reasons:

- Improves local and regional connectivity
- Improves traffic flow and access on Bromley Lane and Baseline Road

- Extends the time before improvements are needed at Bromley Lane and Baseline Road
- Is a familiar solution, since roundabouts are already in use in the community

5.6 Future Agency Collaboration and Public Involvement Opportunities

A 30 day public review period will begin once the EA is signed to gather public input for consideration. The project team members will continue to coordinate and interact with stakeholders and community members to inform them of the upcoming project activities and answer questions.

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Glossary

Acquisition: Acquisition is the process of obtaining right of way by negotiation and/or eminent domain proceedings. Negotiation would involve getting the owner to convey, dedicate, or possibly option the property to the public agency. Just compensation must be paid in all acquisitions or takings.

Alignments: Alignments refer to the geometric design elements that define the horizontal and vertical configuration of the roadways.

Average daily traffic (ADT): Average 24-hour traffic volume of a given location on a typical weekday.

Arterial highway: An arterial highway is a general term denoting a highway primarily for through-traffic, usually on a continuous route.

At-grade: At-grade means a combination of horizontal alignments and vertical grade lines that intersect.

Best Management Practices (BMPs): The best management practices are schedules of activities, practices, and procedures to prevent or reduce pollution of waters of the United States. Such practices include planning strategies, operating procedures, and physical practices to control site runoff.

Capacity: Capacity is the number of vehicles that can traverse a point or section of a lane or roadway during a set time period under prevailing roadway, traffic, and control conditions.

CDOT: The Colorado Department of Transportation, which manages the network of highways within the state.

Census block groups: The smallest geographic area for which the Bureau of the Census collects decennial census data.

Census tract: Small, relatively permanent statistical subdivisions of a county.

Cross section: A cross section is the view of the vertical plane cutting through the roadway, laterally perpendicular to the center line, showing the relationship of the various components of the roadway.

Culvert: A culvert is a structure under a roadway, usually for drainage. It is a bridge-class culvert if it has a clear opening of 20 feet or more measured along the centerline of the roadway between extreme ends of the openings for multiple boxes or multiple pipes that are 60 inches or more in diameter.

Construction Envelope: The physical area that is anticipated to be disturbed during construction of the project.

Decibel: A decibel is a basic unit of sound pressure level. Decibels are logarithmic expressions of sound pressure levels.

Delay: The additional travel time experienced by a driver, passenger, or pedestrian due to circumstances that impede the desirable movement of traffic. It is measured as the time difference between actual travel time and free-flow travel time.

Design capacity: Design capacity refers to an estimated capacity, usually based on vehicles per day or design hourly volume that is used to determine the design of a highway, i.e. number of lanes and other considerations.

Design year: Projects are planned and designed to meet the future, anticipated needs and characteristics of a certain year. This is referred to as the design year. Typically, the design year for roadways is 20 years after the construction year. For bridges, the design year is typically greater.

Diamond Interchange: The most common interchange design, usually consisting of four ramps (two entrance ramps and two exit ramps). Diamond interchanges have a diamond shape when viewed from the air.

Directional Interchange: The directional interchange generally has more than one highway grade separation, with direct connections for the major turning movements.

Drainage channels and side slopes: Side slopes provide a transition from the roadway shoulder to the original ground surface and transmit runoff from the road to a drainage channel.

Endangered species: An endangered species is any species that is in danger of extinction throughout all or a significant portion of its range.

Environmental Assessment (EA): A public document produced as part of the federal National Environmental Policy Act (NEPA) process that evaluates potential impacts of transportation projects to determine whether an Environmental Impact Statement (EIS) is necessary.

Erosion control: Erosion control includes protection of soil from dislocation by water, wind, or other agents.

Federal Highway Administration (FHWA): The branch of the federal Department of Transportation that oversees the national highway system. The FHWA works with CDOT on projects affecting national highways in Colorado.

Finding of No Significant Impact (FONSI): A Finding of No Significant Impact, or FONSI, is a public decision document by a federal agency under NEPA that briefly presents the reasons why an action will not have a significant effect on the built or natural environment and for which an EIS, therefore, will not be prepared.

Frontage road: A frontage road is a roadway that could parallel the bypass in some areas for the purpose of safely and efficiently collecting and distributing traffic between the higher-speed regional bypass and the lower-speed local street system.

Functional class: Functional class is a description of a highway segment's design purpose (interstate, freeway, expressway, arterial, collector, or local) and location (urban or rural). Among other things, functional class defines a highway segment's eligibility for federal funding.

Grade: A grade is the slope of a roadway, channel, or natural ground.

Grade separation: A grade separation is the crossing of two highways or a highway and a railroad at different levels.

Hazardous materials: Materials that pose a risk to human health or the environment.

Highway structure: Highway structure is a general term to refer to various highway design features that are of particular concern to utility installations, i.e., bridges.

Historic properties: Buildings, structures, objects, sites, or districts with historical or archeological significance that are listed in, or eligible for listing in, the National Register of Historic Places.

Impermeability: Impermeability refers to the resistance an asphalt pavement has to the passage of air and water into or through the pavement.

Interchange: Interchange is a system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways or highways on different levels. A proposed interchange will be designated as an interchange when the construction contract has been awarded, regardless of whether it is open to the public.

Intersection: An intersection is any at-grade connection with a roadway, including two roads or a driveway and a road.

Level of service: Level of service is a measure of traffic flow and congestion. As defined in the Highway Capacity Manual, it is a qualitative measure describing operational conditions within a traffic stream; generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Median: The median is the physical separation provided between opposing lanes of traffic.

Mitigation: Mitigation is a technique or means of reducing impacts to resources or to the natural environment. Mitigation includes avoiding the impact altogether by not taking a certain action or parts of an action; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

MS4: The abbreviation for Municipal Separate Storm Sewer System, a system used for collecting or conveying stormwater that is not a combined sewer or part of a publicly owned treatment works.

National Ambient Air Quality Standards (NAAQS): The nationwide health-based air quality standards that have been established by the U.S. Environmental Protection Agency.

NEPA: The National Environmental Policy Act, established by Congress in 1969, requires a federal agency to document the environmental impact of its actions, including an evaluation of alternatives.

Noise abatement criteria (NAC): Noise abatement criteria are absolute sound levels, provided by FHWA, used to determine when a noise impact occurs.

Noise barrier: A noise barrier is a solid wall or earth berm located between the roadway and receiver location, which breaks the line of sight between the receiver and the roadway noise sources.

Public involvement: Public involvement is an ongoing phase of the project planning process that encourages and solicits public input and provides the public the opportunity to become fully informed regarding project development.

Queuing: The formation of lines of automobiles waiting on a stop-controlled facility.

Retaining walls: Retaining walls are vertical walls used to retain earth. A wall for sustaining the pressure of earth or filling deposited behind it.

Right of Way (ROW): Right of way is a general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to transportation purposes. Right of way is the entire width of land between the public boundaries or property lines of a highway. This may include purchase for drainage.

Signal timing: The coordinated timing of a sequence of traffic signals that allows vehicles to progress along an arterial or cross an arterial. The goal of signal timing is to minimize delay (the time a vehicle must wait at a signal) at intersections.

Single-Point Urban Interchange: An interchange design similar to the diamond interchange, but with all ramps controlled by a single set of traffic signals.

Scoping: Scoping is the process that occurs prior to the preparation of an EIS. Scoping may include a meeting or series of meetings, an environmental analysis, and interagency coordination. Any information that is gathered will be used and provides the basis for the preparation of the EIS.

Section 4(f) property: A significant publicly owned park, recreation area, wildlife and waterfowl refuge, or historic property (including archeological sites) protected by Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 USC 303).

Shoulder: The shoulder is the paved portion of the highway outside of the travel lane.

Tight Diamond Interchange: An interchange design that shifts the entrance and exit ramps closer to the freeway than in a traditional diamond interchange. This interchange type requires less land than a traditional diamond interchange.

Trip generation: Trip generation is the procedure by which estimates of the number of trips produced and attracted by the zone within an urban area are developed.

Turning movement: Turning movement is the traffic making a designated turn at an intersection.

Vehicle miles of travel (VMT): Vehicle miles of travel is a unit to measure vehicle travel made by a private vehicle, such as an automobile, van, pickup truck, or motorcycle. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle.

I-76 & Bridge Street INTERCHANGE



Transportation

Technical Report

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List of acronyms and abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADT	Average daily traffic
Brighton	City of Brighton
CDOT	Colorado Department of Transportation
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
I-76	Interstate 76
IAR	Interchange Access Request
LOSS	Level of Service of Safety
MP	Milepost
MVRTP	Metro Vision Regional Transportation Plan
RTD	Regional Transportation District
SH 52	State Highway 52
TMC	Turning movement count
US 36	US Highway 36
US 85	US Highway 85
US 287	US Highway 287

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TRANSPORTATION SUMMARY

The City of Brighton (Brighton) is transforming from a rural, agricultural town to a suburban community, placing demands on the existing transportation network. Brighton, in collaboration with the Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA), has identified current issues with traffic distribution in eastern Brighton that are expected to worsen as development continues around Interstate 76 (I-76)—a key connection between Brighton and Denver.

The I-76 and Bridge Street Interchange Project was initiated in 2013 to identify and implement an appropriate solution to address these issues. Based on the System-Level Study completed in September 2013, the City of Brighton has demonstrated that an interchange at I-76 and Bridge Street will meet the purpose and need of the project and is the most reasonable and feasible option for addressing current and anticipated issues. An interchange at I-76 and Bridge Street will provide access and regional connectivity that cannot be achieved by other planned, committed, or possible alternate routes. Introducing a new interchange at Bridge Street will provide an additional option to access I-76. This will result in a better distribution of local trips, while also alleviating high traffic volumes currently circulating on frontage roads and other surface streets.

This Technical Memorandum evaluates the existing and anticipated transportation impacts in the vicinity of I-76 and Bridge Street that might occur due to changes to the current transportation system. By analyzing the current and future impacts of various alternatives—from a no-action alternative, under which the system remains the same, to various action alternatives—this Environmental Assessment (EA) identifies a Preferred Alternative that will improve the transportation system.

The Preferred Alternative includes one six-legged roundabout on either side of I-76. The design has minimal right-of-way impacts and will not adversely impact traffic operations on I-76 in the study area. By providing additional points of access to I-76, the proposed interchange should reduce congestion and delays at surrounding intersections and improve safety system-wide.

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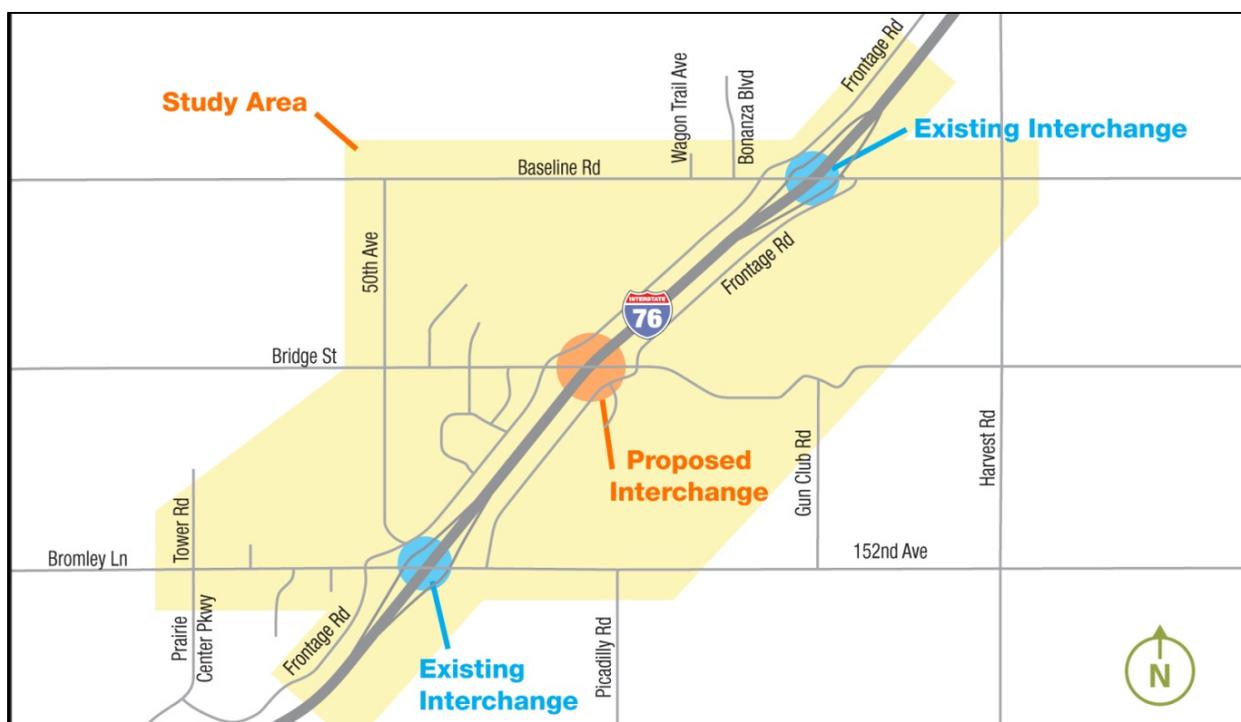
1. Introduction

The I-76 & Bridge Street Interchange Environmental Assessment is a joint effort among the City of Brighton, the FHWA, and CDOT. The intent of this EA is to identify potential impacts of the proposed interchange on the human and natural environment.

1.1 Project Description

The City of Brighton proposes to construct an interchange at Bridge Street and I-76 in eastern Brighton. The project is located in Adams County, Colorado, approximately 25 miles northeast of Denver. The study area is defined as the area surrounding the Bridge Street overpass over I-76, including the frontage roads and interchanges along I-76 from Baseline Road to Bromley Lane (see Exhibit 1-1).

Exhibit 1-1. Study Area



The purpose of the project is to increase local and regional east-west connectivity, reduce the amount of travel delay through the planning horizon year of 2035, and improve traffic flow and access in the study area. The project is needed because of a lack of local and regional connectivity, current and projected congestion and associated travel delay, and poor current and future traffic flow on the frontage roads.

Bridge Street is a regionally significant roadway, according to the Denver Regional Council of Governments' (DRCOG's) 2035 Metro Vision Regional Transportation Plan (MVRTP). Interchange connections from state highways must be made to regionally significant roadways that serve regional travel purposes and provide access to regional destinations. Bridge Street currently connects to US Highway 85 (US 85), US Highway 36 (US 36), and US Highway 287 (US 287). Thus, the proposed interchange connection at I-76 fits the character of the roadway and is supported by the following regional and local planning documents:

- DRCOG's 2035 MVRTP

- 2012 Adams County Transportation Plan
- Adams County's Top-Ten Ranked Urbanized Road Priority Projects
- City of Brighton's capital improvement funding plan for 2014–2018, with \$9.5 million allocated for the project in 2016

1.2 Summary of Results

1.2.1 2013 Existing Conditions

The Brighton area currently has two interchanges along I-76: one at Bromley Lane and one at Baseline Road, as shown in **Error! Reference source not found.** The results of the existing traffic operational analysis indicate that the Bromley Lane interchange is the primary entry/exit point from I-76. This is expected, since it is located farther south, making it closer to Denver and Aurora (large employment centers and principal destinations for many trip purposes). Under existing traffic conditions, the intersections in the areas of the Bromley Lane and Baseline Road interchanges are beginning to show signs of congestion and increased queuing, which impact operations and ultimately will result in impacts to safety. As traffic volumes continue to increase in the future, further degradation of traffic operations and safety in the study area is expected.

1.2.2 2035 Horizon Year Summary (No-Action Conditions)

By 2035, traffic volumes at both Bromley Lane and Baseline Road will increase to the point where traffic operations along the arterials will be unacceptable. The operations and safety of traffic using the mainline lanes of I-76 may be impacted by queuing on the ramps and an increase in weaving maneuvers due to the increase in the number of vehicles using the facility. Under No-Action conditions, significant improvements will be required at the Bromley Lane interchange, including expanding the existing structure to at least four lanes to resolve operational and safety issues that are expected to occur. Without the addition of the Bridge Street interchange, it is likely that the Bromley Lane interchange will need to be reconstructed no later than the year 2025.

1.2.3 Action Alternative Summary

The addition of a new interchange at Bridge Street will provide local travelers with an additional option to access I-76. This will result in a better distribution of local trips and will alleviate high traffic volumes that are currently circulating on frontage roads and other surface streets to gain access to I-76 at the Bromley Lane and Baseline Road interchanges. The new interchange also will improve traffic operations, effectively extending the expected life span of the existing infrastructure at Bromley Lane until at least 2030 and possibly even later, depending on actual traffic volumes that alter their patterns to use the new interchange at Bridge Street. The analysis indicates the projected traffic volumes at the new Bridge Street interchange will remain well below operational capabilities under all 2035 conditions, leaving adequate room for the interchange to attract even larger volumes away from the adjacent interchanges. In addition, congestion and travel delay in the overall study area is expected to be reduced in 2035 if an interchange is constructed at Bridge Street.

Finally, the addition of a new interchange will not have a negative impact on the overall safety of motorists in the study area. By attracting traffic away from the congested Bromley Lane interchange and local roadways, the interchange is expected to alleviate potential safety concerns. The ramp merge and diverge areas introduced by the new interchange create conflicts that did not exist before; however, they will be built to CDOT and AASHTO standards, so safety impacts should be average or expected. The roundabout concept that is recommended in the Preferred Alternative is expected to enhance safety benefits by minimizing crash severity.

1.3 Applicable Guidance and Analysis Tools

Several guidance and analysis tools were used in preparing travel demand forecasts and analyzing existing and expected traffic conditions in the study area. Prior to completing the traffic analysis, a methodology report was prepared for review by CDOT and FHWA that discussed tools to be used and measures of effectiveness to be reported. The models and measures are discussed in detail in a copy of the Traffic Operations Methodology Memorandum in Appendix A.

The facilities within the study area include local roadways and regional corridors, as shown in **Error! Reference source not found.** To satisfy the requirements of CDOT's 1601 policy directive and the Interchange Access Request (IAR), the study area is required to include one interchange in each direction along the interstate from the location of the proposed interchange. Based on the location of the proposed Bridge Street interchange, the adjacent interchanges are at Bromley Lane and Baseline Road. In addition, surface streets should be analyzed to the first signalized or major intersection beyond any interstate ramp junctions.

The Bridge Street overpass is approximately 1.25 miles north of the existing Bromley Lane/I-76 Interchange and approximately 1.5 miles south of the existing Baseline Road/I-76 Interchange. The current interchange spacing (approximately 2.5 miles between Bromley Lane and Baseline Road) is within accepted American Association of State Highway and Transportation Officials (AASHTO) guidelines.

Based on CDOT and FHWA requirements, the study area is bounded by Baseline Road on the north, Bromley Lane on the south, 50th Avenue and Tower Road on the west, and Picadilly Road and Harvest Road on the east. The area is comprised of land uses typically found in suburban areas, including residential and commercial to the west of I-76 and industrial land uses to the east of I-76.

2. Existing Conditions

An understanding of existing conditions experienced by users of I-76, Bridge Street, and adjacent arterials was developed through an existing conditions operational analysis. The following sections describe the current multi-modal transportation system within the study area, the assessment of existing safety conditions, existing traffic volumes and patterns, and the results of the operational analysis.

2.1 Existing Roadway Facilities

The following is a brief description of the roadways that are contained within the boundaries of the study area based on their classifications in the DRCOG Regional Travel Demand Model.

2.1.1 I-76

I-76 is a four-lane interstate highway with a depressed median. The highway connects I-70 to the west with I-80 to the east. I-76 also intersects I-25 just north of downtown Denver and US-85 just south of Brighton. I-76 is defined as an east-west highway even though its orientation through Brighton is north-south.

I-76 is classified as FW: "Interstate System Freeway Facility," according to the CDOT highway access code. The facility is located in flat and rolling terrain from the beginning of the segment on the south end of the study area to the Baseline Road interchange. The section of I-76 northeast of the Baseline Road interchange is considered "Rural Interstate."

Currently, there are full movement interchanges on I-76 in the study area at Bromley Lane and Baseline Road, with Bridge Street being grade separated over I-76. Additional full movement interchanges are located one and two miles to the south of Bromley Lane, at 144th Avenue and 136th Avenue, respectively. State Highway 52 (SH 52), the first interchange north of the study area, is a full movement interchange and is located six miles to the north of Baseline Road.

2.1.2 I-76 Frontage Roads

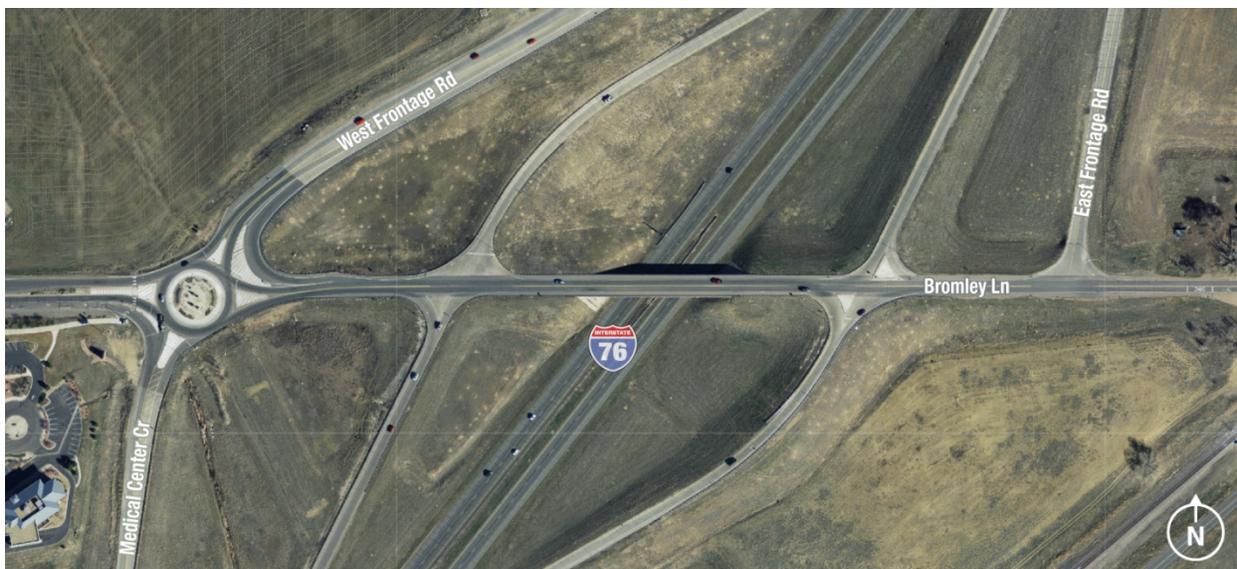
Two-lane frontage roads exist along both the east and west sides of I-76 between the Bromley Lane and Baseline Road interchanges. The West Frontage Road continues north of Baseline Road and south of Bromley Lane, but the East Frontage Road terminates at these roadways. The frontage roads allow traffic to circulate between the existing interchanges and Bridge Street, which does not have direct access to I-76.

2.1.3 Bromley Lane

Bromley Lane is a major east-west thoroughfare serving residential and commercial trips to Brighton (see Exhibit 2-1). Bromley Lane is classified as a multi-lane “Principal Arterial” west of I-76 and a two-lane “Collector” east of I-76. The existing Bromley Lane overpass at I-76 is two lanes wide. Bromley Lane currently has a high density of access locations in the vicinity of the I-76 interchange and to the west toward Tower Road. There are a total of 13 full- and partial-movement access locations between Tower Road and the East Frontage Road (approximately one mile). Picadilly Road is the first significant access location east of the East Frontage Road.

Bromley Lane provides full movement access to/from I-76 in the form of a standard diamond interchange (see Exhibit 2-1). Bromley Lane passes over I-76 and intersects at a roundabout intersection with the West Frontage Road west of the southbound on ramp. Bromley Lane intersects with the northbound exit on and off-ramps at a stop-controlled intersection. The intersection of Bromley Lane and the East Frontage Road is stop controlled.

Exhibit 2-1. Aerial View of I-76 and Bromley Lane Interchange

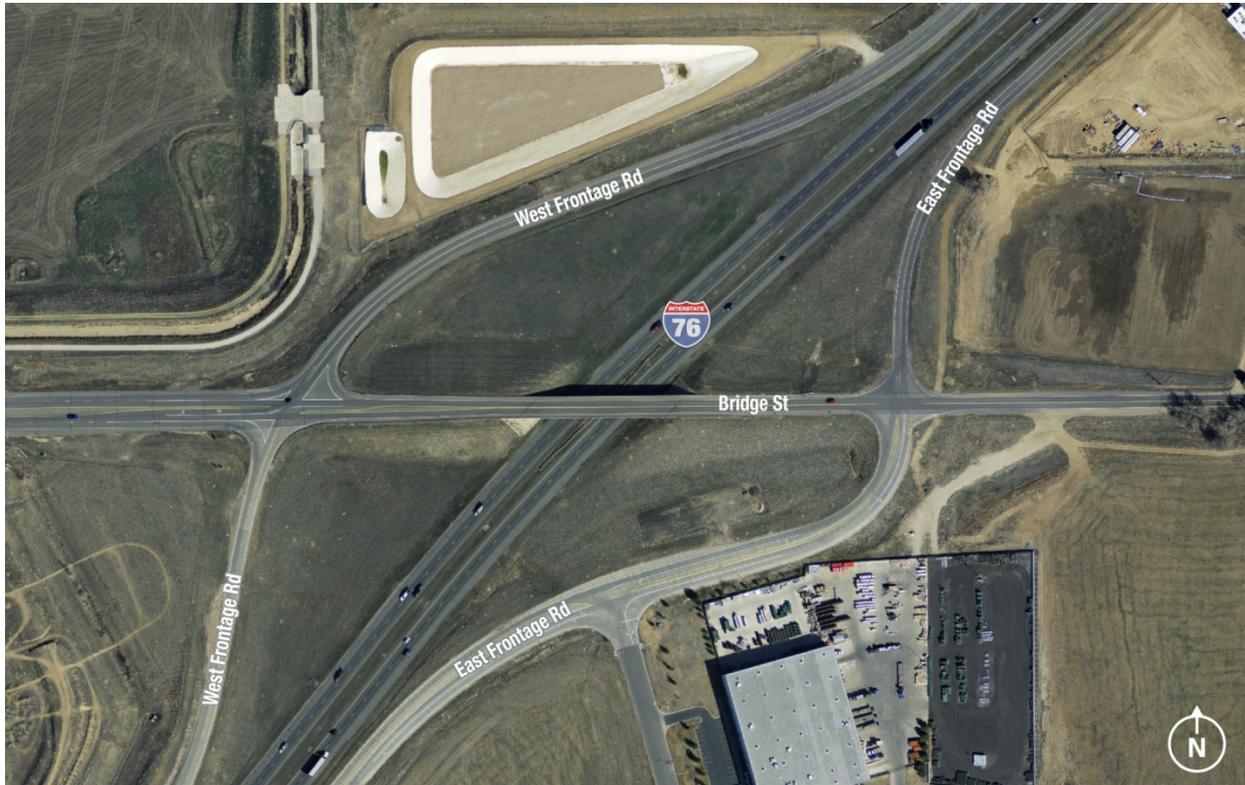


2.1.4 Bridge Street

Bridge Street is a two-lane, east-west “Principal Arterial” in the study area (see Exhibit 2-2). Bridge Street provides Brighton with direct access to I-25 and the northern portion of Thornton, as well as Broomfield and Boulder all to the west of I-76. The existing Bridge Street overpass at I-76 is two lanes wide, and there is no access to I-76 (see Exhibit 2-2). Bridge Street intersects with the West Frontage Road and East Frontage Road at stop-controlled intersections.

There are a total of seven significant access locations on Bridge Street within the study area between 50th Avenue and Gun Club Road, which is a distance of about one mile.

Exhibit 2-2. Aerial View of I-76 and Bridge Street Intersection

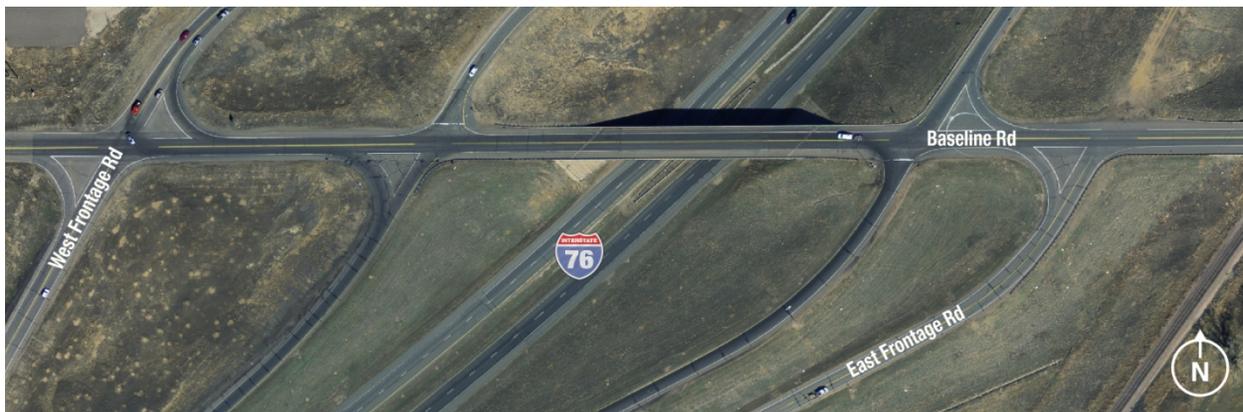


2.1.5 Baseline Road

Baseline Road is an east-west roadway that is classified as a two-lane “Minor Arterial” west of I-76, and a two-lane “Collector” east of I-76. The existing Baseline Road overpass at I-76 is two lanes wide. Baseline Road provides full movement access to/from I-76 in the form of a standard diamond interchange (see Exhibit 2-3). Baseline Road intersects with the West Frontage Road and East Frontage Road at stop-controlled intersections.

Baseline Road has a total of 10 access locations between 50th Avenue (to the west of I-76) and the East Frontage Road (approximately one mile). Harvest Road is the first significant access location east of the East Frontage Road.

Exhibit 2-3. Aerial View of I-76 and Baseline Road Interchange



2.1.6 50th Avenue

50th Avenue is a north-south roadway that is classified as a two-lane “Minor Arterial” between Baseline Road and the West Frontage Road near the Bromley Lane interchange. 50th Avenue provides direct access to large residential areas located just west of I-76 between Bromley Lane and Baseline Road. This arterial provides the shortest route for residents north of Bridge Street to access I-76 at the Bromley Lane interchange.

2.2 Existing System Connectivity and Access

North-south regional connectivity in the study area is limited to two access points to I-76, one at Bromley Lane and one at Baseline Road. This limited connectivity affects the mobility of regional trips, local trips, and emergency vehicles. Trips with origins or destinations along Bridge Street are forced to use the Bromley Lane and Baseline Road interchanges and other surface streets in the study area. This increases travel times (creating longer trip lengths due to out-of-direction travel) and traffic volumes at these interchanges and on the surface streets between the interchanges.

2.3 Existing Transit Service

No transit routes currently travel over the Bridge Street overpass; however, Regional Transportation District (RTD) Bus Route 120 and Bus Route R/RC/RX operate along Bridge Street, 50th Avenue, and Bromley Lane west of the proposed interchange (see Exhibit 2-4).

Exhibit 2-4. RTD Bus Route 120



Source: RTD, 2014

2.4 Existing Pedestrian and Bicycle Facilities

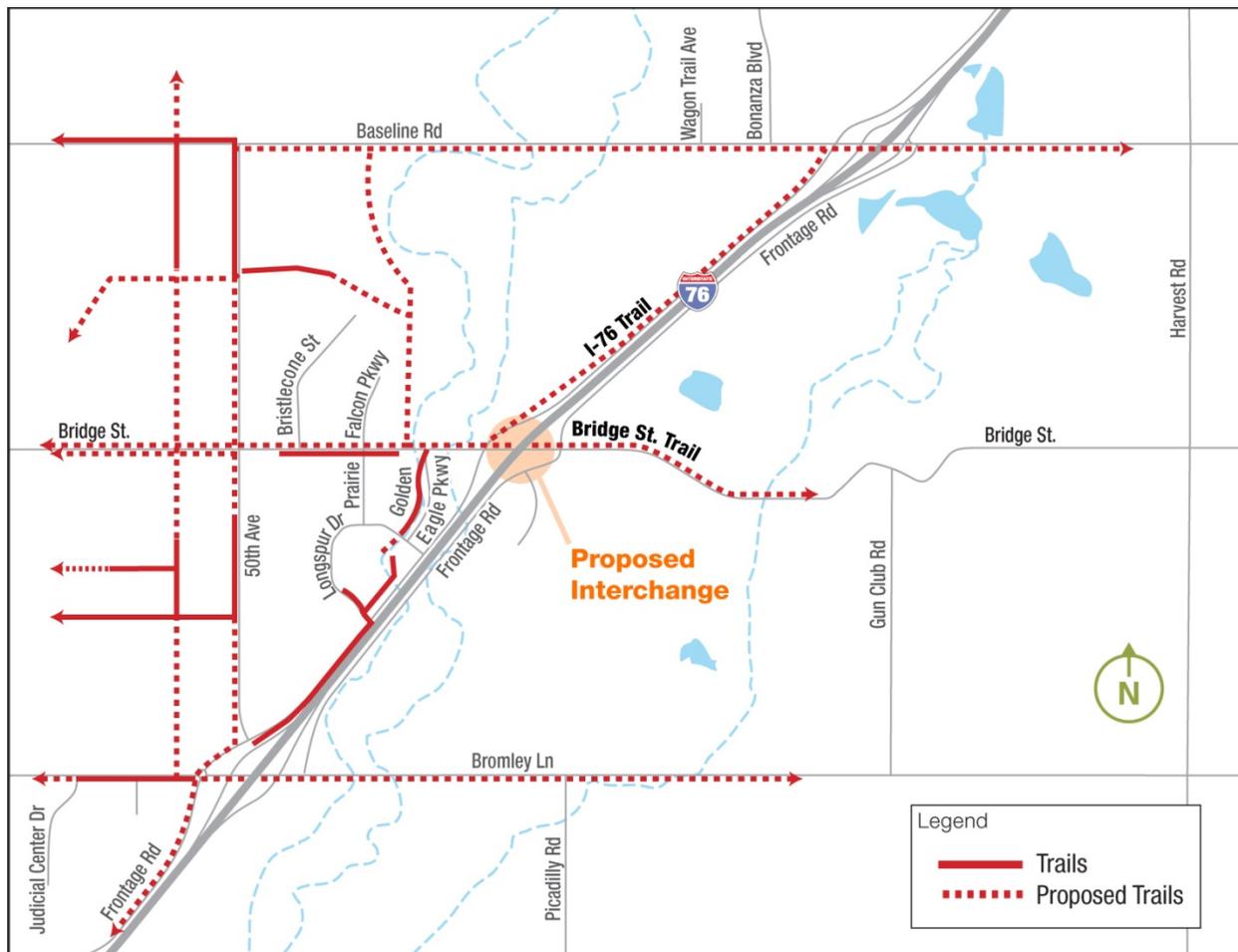
The City of Brighton requires new developments to construct sidewalks on lots located adjacent to major or minor arterials or collectors, or adjacent to primary transportation routes to a public or private school within the city limits. Thus, sidewalk connections within the study area are driven by development. This concurrent process has resulted in gaps within the existing sidewalk system where development has not occurred. Where they do exist, sidewalks generally are separated from roadways and range from five to 10 feet in width. A 10-foot-wide paved path extends from 50th Avenue to Larkspur Road and is located approximately 50 feet away from the West Frontage Road.

As indicated by Brighton’s sidewalk policy, sidewalks are a valuable asset to the community. Solutions for the project should not preclude pedestrian access. Sidewalk connectivity is expected to increase as new development occurs within the study area.

The City of Brighton Parks and Recreation Department developed the Greenways and Trails Plan with the mission, “to create an integrated system of high-quality multi-use trails, greenways, and bicycle and pedestrian routes serving the people of Brighton and the surrounding communities. The system should link to enhance the larger regional and statewide trail system.” There are no existing bike lanes through

the proposed interchange on Bridge Street or on the frontage roads. There are two planned, multi-use trails through the proposed interchange: one on I-76 and one on Bridge Street (see Exhibit 2-5).

Exhibit 2-5. Trails in the Study Area



Source: City of Brighton Greenways and Trails Plan

2.4.1 Bridge Street Trail

The planned Bridge Street Trail extends to I-76. It will have a concrete surface, and is expected to be funded by developers as properties are developed. Portions of the trail have been constructed as a 10-foot-wide paved path separated from the roadway.

2.4.2 I-76 Trail

The nine-mile I-76 Trail follows I-76 along its length from Baseline Road to 112th Avenue using the highway right of way, except for a one-mile portion shared with the proposed Prairie Center Parkway on-street trail. The proposed trail is planned to have a concrete surface.

2.5 Existing Truck and Rail Freight Facilities

The City of Brighton has designated the following truck routes within the study area: I-76, Bridge Street, Baseline Road, Bromley Lane, and 50th Avenue (see Exhibit 2-6).

Exhibit 2-6. Truck Routes in the Study Area

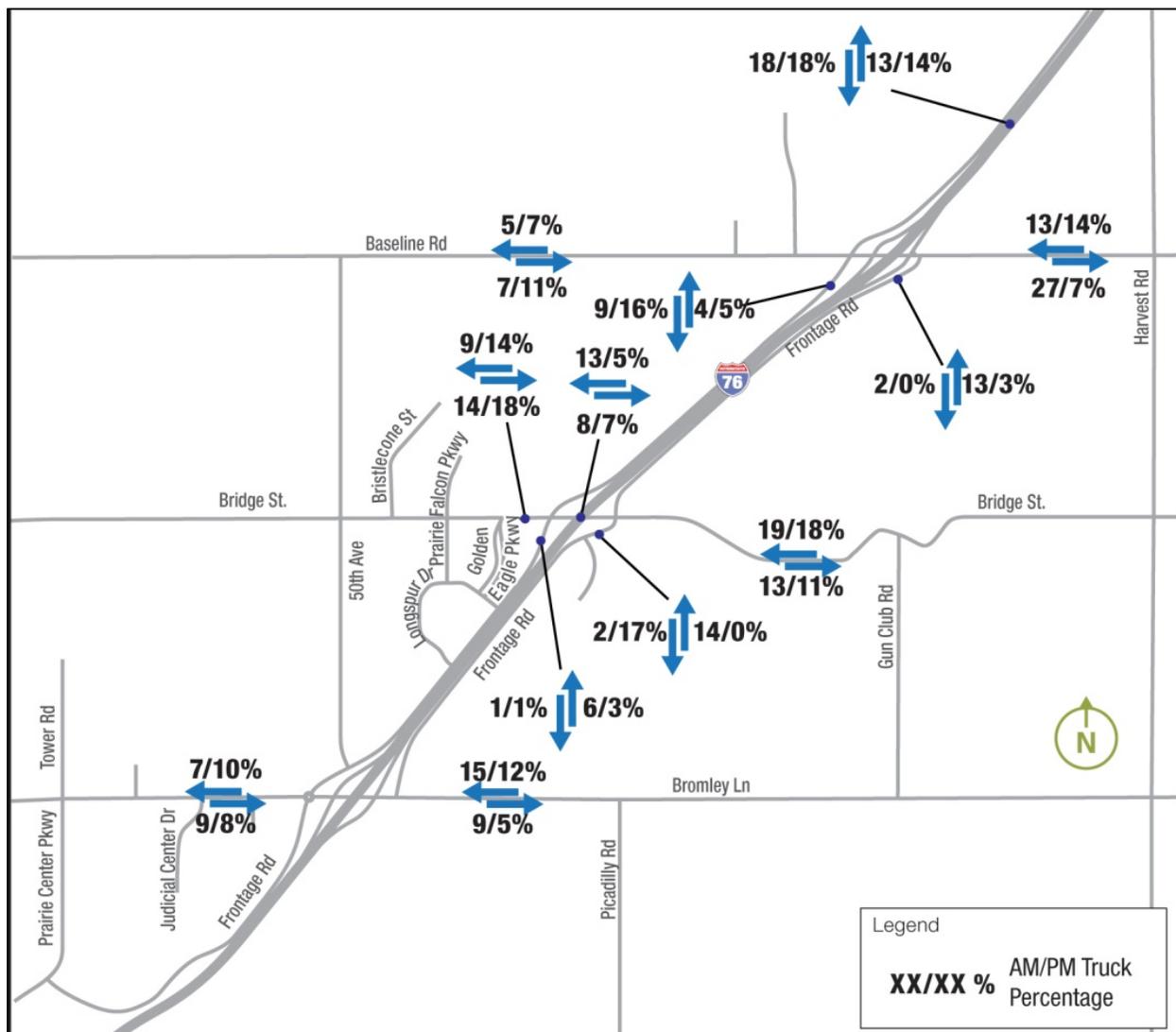


Source: City of Brighton, 2013

Vehicle classification data were collected for a 24-hour weekday period (see Appendix C). The truck traffic percentages in the study area range between 4 percent and 27 percent on all roadways. I-76 is a major shipping route for destinations to the north along I-80, which is consistent with the high percentage (27 percent) of truck traffic on I-76. I-76 east to Nebraska and north of Brighton has less residential development compared to the rest of Brighton and south to Denver. This causes the truck percentages to be relatively high. The observed percentages are likely to decrease due to the future influx of residential and commercial land uses and the associated increase in passenger car traffic volumes.

Truck percentages on all roads east of I-76 and on Bridge Street west of I-76 are consistently higher than 10 percent because these roads have lower overall volumes compared to other facilities in the area (see Exhibit 2-7). The data indicate trucks are using the frontage roads between Bridge Street and Baseline Road to gain access to/from I-76.

Exhibit 2-7. Truck Percentages



2.6 Safety Assessment of Existing Conditions

CDOT performed a safety assessment for I-76 between milepost (MP) 21.50 and MP 26.50 (just south of Bromley Lane to about one mile north of Baseline Road). The safety assessment can be found in Appendix D. The following sections summarize the findings of that report.

The concept of Level of Service of Safety (LOSS) uses qualitative measures that characterize safety of a roadway segment in reference to its expected performance and severity. If the LOSS predicted represents a normal or expected number of crashes at a specific level of average daily traffic (ADT), then the degree of deviation from the norm can be used to represent specific levels of safety. LOSS can be obtained for both total number of crashes and severity of crashes.

- LOSS I: Indicates a low potential for crash reduction
- LOSS II: Indicates a better-than-expected safety performance
- LOSS III: Indicates a less-than-expected safety performance
- LOSS IV: Indicates a high potential for crash reduction

2.6.1 Crash Summary

Five years of CDOT crash data (January 1, 2008, through December 31, 2012) was examined to locate crash clusters and identify crash types. In the study period, 198 crashes were reported along I-76 between MP 21.50 and MP 26.50. This includes the crashes that occurred within the interchange areas and also along the frontage roads. There were 24 crashes that caused injuries and two that resulted in fatalities on I-76.

2.6.2 I-76 Safety Performance

CDOT has developed a method to analyze safety performance that estimates normal or expected crash frequency for a range of ADTs among similar facilities. The safety performance is based on 10 years of historical data. Compared to similar four-lane urban freeways, I-76 within the analyzed area has an expected crash frequency. In some cases, it also has a less-than-expected crash frequency when a more granular segment is analyzed, such as between MP 25.15 and MP 26.50 (Baseline Road to Lochbuie).

CDOT analyzed the crash data for the I-76 mainline between January 1, 2008, and December 31, 2012 (a total of five years). The I-76 segment between MP 21.50 (south of the study area) and Bromley Lane (MP 22.41) had an accident frequency that was near expected safety performance (LOSS II/LOSS III) when compared to other four-lane urban freeways within Colorado.

The segment between Bromley Lane (MP 22.41) and Baseline Road (MP 25.15) had an accident frequency that was better than expected (LOSS II). The segment between Baseline Road (MP 25.15) and MP 26.50 (north of the study area) had a better-than-expected safety performance and a low potential for accident reduction (LOSS I/LOSS II) when compared to other four-lane rural interstates within Colorado.

2.6.3 I-76 Recent Improvements

Cable rail was installed between Bromley Lane and Baseline Road in early 2013 as a safety improvement project. This area covers where a fatal head-on crossover collision occurred in 2010. The entire stretch of I-76 within the study segment now has median cable rail. Rumble strips were installed between Bromley Lane and Baseline Road in early 2013. The cable rail and rumble strips may serve to prevent or mitigate overturning vehicle crashes. Shoulder strips (inside/outside) are present along I-76 north of Bromley Lane. This should help reduce crashes caused by drivers who fall asleep at the wheel or inadvertently drift off the road.

Exhibit 2-8. I-76 Urban Crashes

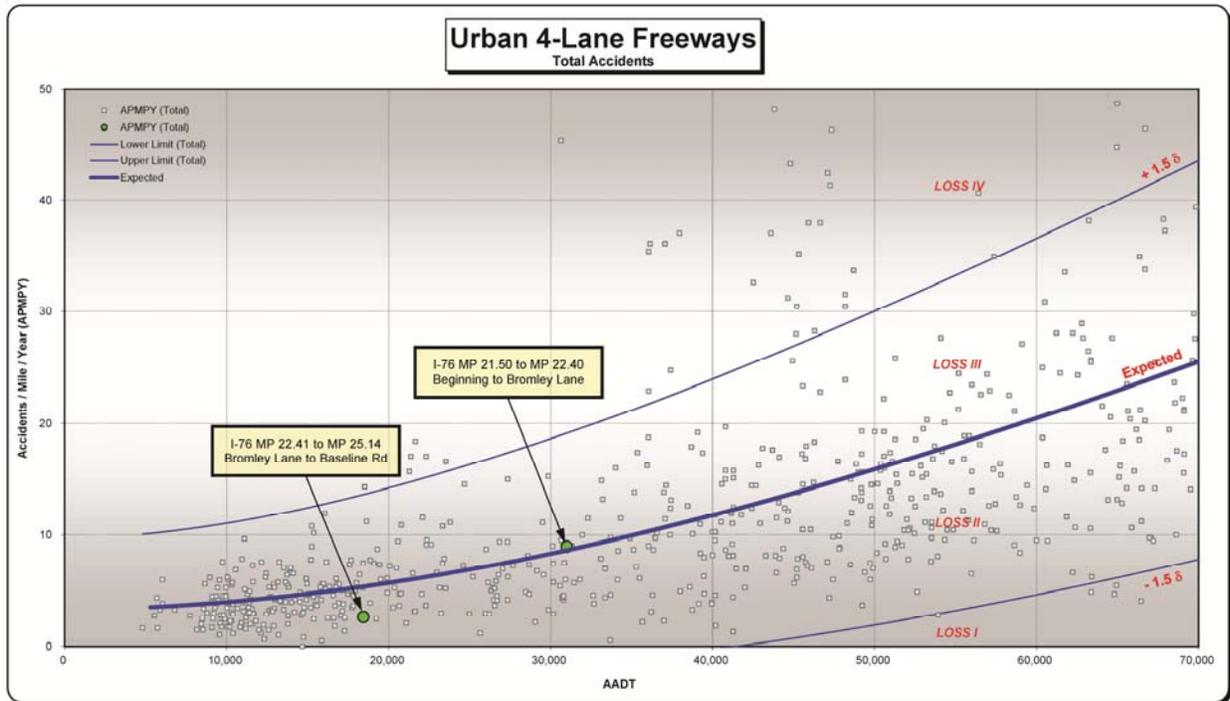
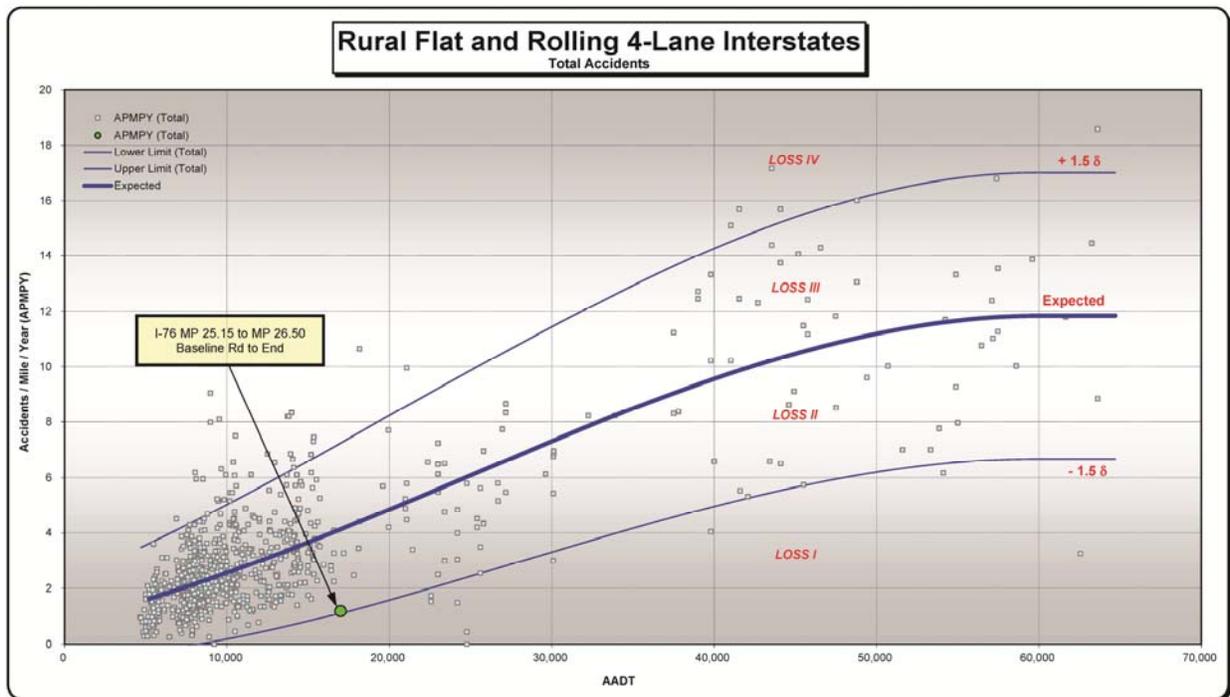


Exhibit 2-9. I-76 Rural Crashes



2.6.4 Safety of Non-Freeway Facilities

I-76 and Bromley Lane/Baseline Road Ramps

CDOT analyzed the crash type for I-76 and Bromley Lane/Baseline Road ramps and the frontage roads and arterials. The results regarding the crash types are reported in the safety assessment; however, no significant patterns susceptible to correction were identified. There were no fatal crashes at these locations.

I-76 and Bromley Lane Interchange

The I-76 westbound ramp terminus with Bromley Lane had 18 crashes over the five-year study period, which is higher than expected for this type of intersection (LOSS IV). The I-76 eastbound ramp terminus with Bromley Lane had 22 crashes over the five-year study period, which is also higher than expected (LOSS IV). Recommended mitigation measures are addressed later in the report and could be considered as part of a separate safety improvement project.

I-76 and Baseline Road Interchange

No crash patterns were detected.

I-76 West Frontage Road

Accident frequency at Bromley Lane is higher than expected (LOSS III). The addition of the new roundabout in 2009 may have improved the situation, but more years of crash data are needed to make that determination.

Accident frequency at 50th Avenue is higher than expected (LOSS IV). Most of the crashes are related to vehicles turning from 50th Avenue onto the frontage road.

Accident frequency at Baseline Road is higher than expected (LOSS III/LOSS IV). Changes to this intersection will be outside the scope of the proposed interchange at Bridge Street. A separate safety project should be considered at this location.

I-76 East Frontage Road

No crash patterns were detected.

2.7 Data Collection Methodology

To complete the traffic analysis, an extensive traffic data collection effort was undertaken in April 2013. Data collected included:

- 24-hour ADT volumes
- Peak-hour (AM/PM) intersection turning movement counts (TMC)
- 24-hour classification data

All traffic data can be found in Appendix C. The locations and types of data collection efforts are shown in Exhibit 2-10.

2.7.1 Average Daily Traffic Volumes

The ADT data were collected over a 24-hour weekday period to represent typical traffic volumes and avoid possible atypical traffic patterns that may occur on the weekends.

The ADT counts provide a baseline for evaluating existing 2013 conditions and are used to help calibrate the travel demand models for future years. Based on the ADT counts, the peak hour for traffic volumes was determined to be from 7:00 a.m. to 8:00 a.m. for the morning peak and from 5:00 p.m. to 6:00 p.m. for the evening peak. Daily and peak-hour volumes for the study area are shown in Exhibit 2-13, Exhibit 2-14, and Exhibit 2-15.

Baseline Road

The estimated capacity of a two-lane structure such as Baseline Road over I-76 is 34,000 vehicles (two-way volume) per day, or about 1,400 vehicles in a peak hour. The traffic volume data indicated that Baseline Road currently carries about 20 percent of the structure's daily capacity (Exhibit 2-13).

Bridge Street

The current traffic volumes on the Bridge Street overpass represent about 10 percent of the daily estimated capacity for the structure, and the peak-hour volumes are well below capacity (Exhibit 2-14).

Bromley Lane

Similar to Baseline Road, the two-lane structure over I-76 is currently carrying about 20 percent of the estimated daily capacity, but peak-hour volumes are about 70 percent of the hourly capacity levels (Exhibit 2-15).

I-76

Existing volumes on all segments of I-76 are well below the daily (192,000 vehicles per day for two-way traffic) and hourly capacity levels of a four-lane freeway.

Frontage Roads

The volumes indicate vehicles are using the frontage roads to circulate between Bridge Street and the adjacent interchanges to gain access to/from I-76. The section of the West Frontage Road between Bromley Lane and 50th Avenue carries 8,500 vehicles per day, but the volume north of 50th Avenue is only 2,300 vehicles per day. This indicates a high volume of traffic using 50th Avenue to travel north-south between the Bromley Lane interchange and the residential areas west of I-76 and south of Bridge Street.

50th Avenue

Traffic patterns on 50th Avenue are consistent with vehicles traveling to/from the I-76 interchange at Bromley Lane and to/from Bridge Street.

2.7.2 Peak-Hour Turning Movement Counts

Peak-hour TMCs are shown in Exhibit 2-16. The TMCs are used to help evaluate the operations of intersections under 2013 conditions. The existing TMCs also are used to develop future-year turning movement volumes. The TMC data were collected between the hours of 7:00 a.m. and 8:00 a.m. and from 5:00 p.m. to 6:00 p.m. on a Wednesday to represent typical weekday traffic volumes. The peak hours when TMC's would be affected were identified by Brighton staff based on their familiarity with traffic conditions in the area.

2.8 2013 Existing Conditions Operational Analysis

An operational analysis was completed for the 2013 existing conditions based on the collected data and using Highway Capacity Software (HCS). A detailed discussion on the methodologies and analysis tools

used to complete the evaluation of existing and all future conditions can be found in the Traffic Operations Methodology Memorandum in Appendix A. In general, the latest version of HCS was used to evaluate all elements of the transportation network. The overall results of the operational analysis are described in more detail in the following sections. Detailed HCS reports are provided in Appendix E.

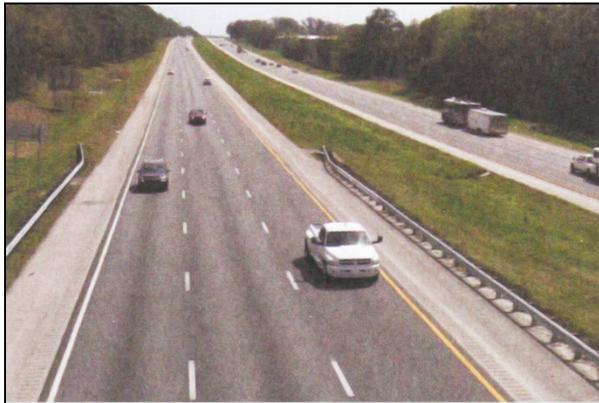
Traffic engineers define the quality of traffic flow on a roadway, or intersection congestion, as a level of service (LOS). LOS considers factors such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The LOS is described by a letter designation from "A" to "F," with LOS A representing essentially uninterrupted flow with minimal delays and LOS F representing a breakdown of traffic flow with excessive congestion and delay. See Exhibit 2-11 for LOS definitions, and Exhibit 2-12 for examples of freeway LOS.

Exhibit 2-11. Transportation Network Element LOS Definitions

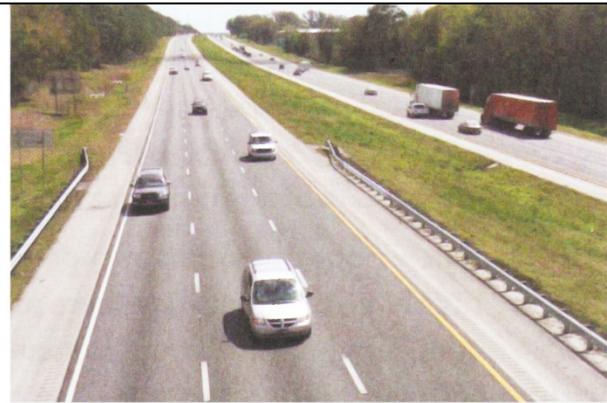
LOS	Intersections (sec/veh)			Freeway Elements (pc/mi/ln)	
Level	Signal Control	Stop Control (two-way and all-way)	Roundabout	Segments	Ramp Areas (merge/diverge)
A	0-10	0-10	0-10	0-11	0-10
B	10-20	10-15	10-15	11-18	10-20
C	20-35	15-25	15-25	18-26	20-28
D	35-55	25-35	25-35	26-35	28-35
E	55-80	35-50	35-50	35-45	>35
F	>80	>50	>50	>45	Demand Exceeds Capacity

Source: Highway Capacity Manual 2010

Exhibit 2-12. Freeway LOS Examples



LOS A



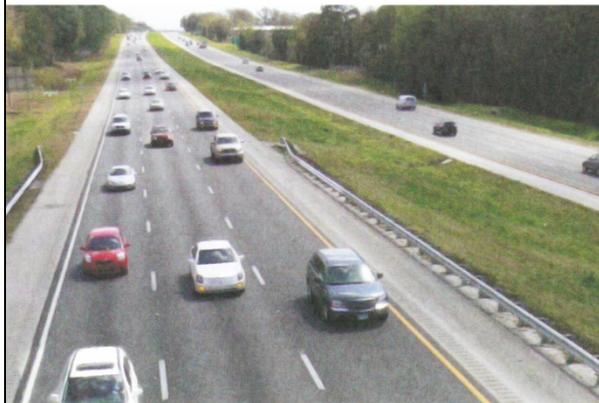
LOS B



LOS C



LOS D



LOS E



LOS F

Source: *Highway Capacity Manual 2010*

Exhibit 2-13. Existing Daily and Peak-Hour Traffic Volumes at Baseline Road

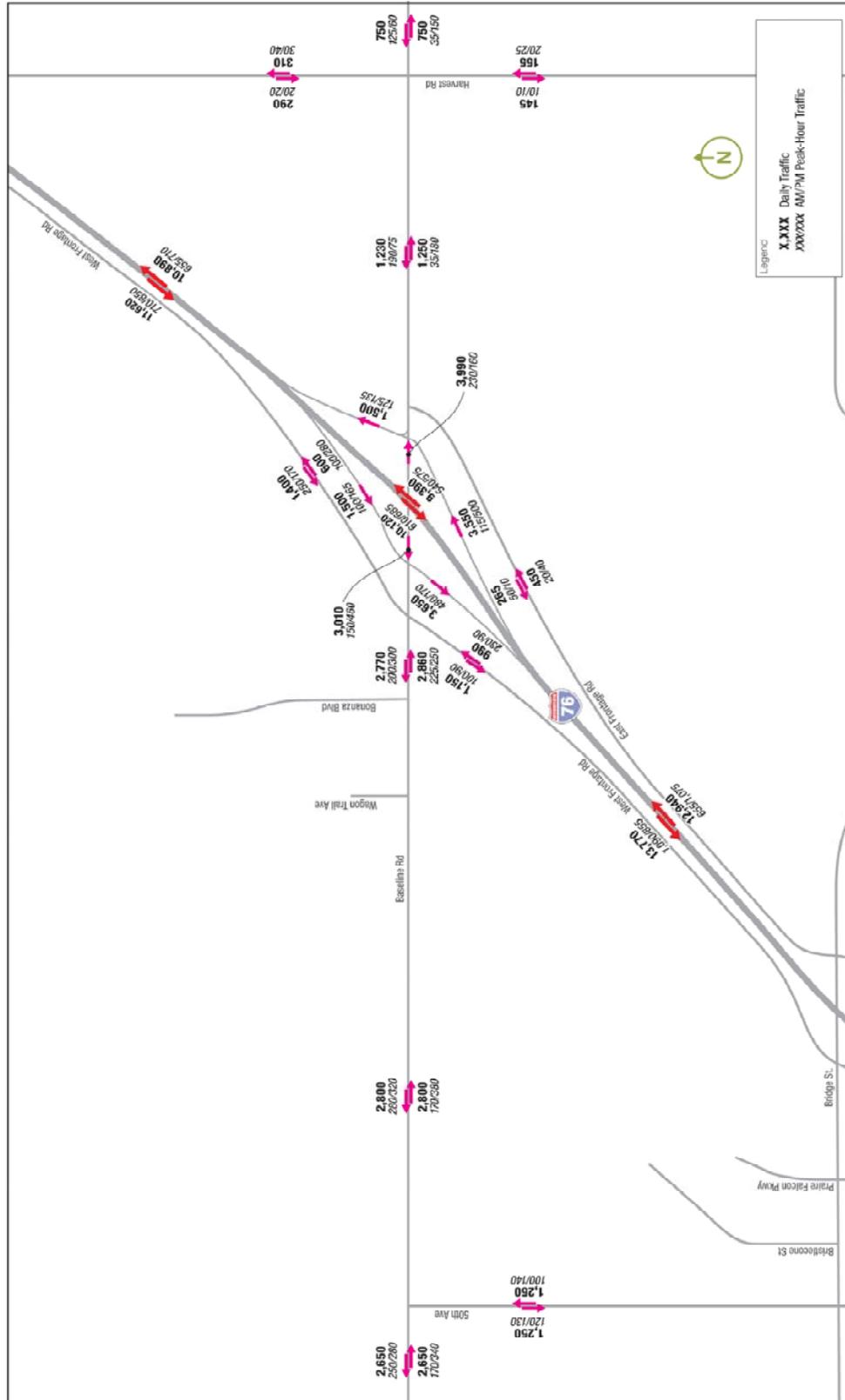


Exhibit 2-14. Existing Daily and Peak-Hour Traffic Volumes at Bridge Street

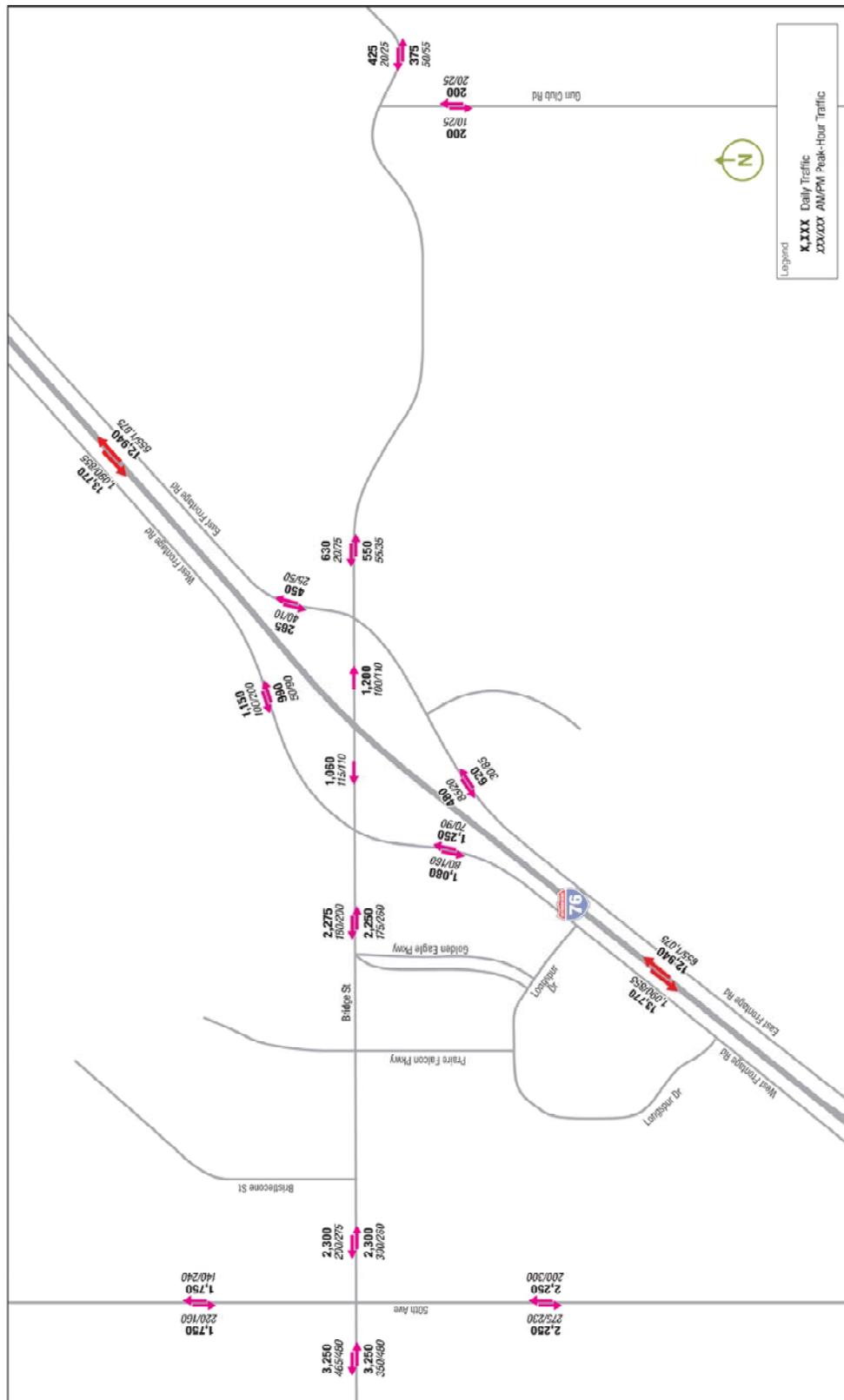


Exhibit 2-18. Existing I-76 Level of Service, PM Peak



2.8.1 I-76 Freeway Elements

The results for the existing freeway elements operational analysis are shown in Exhibit 2-19.

- For existing conditions, all of the basic freeway mainline segments and ramp merge/diverge areas operate at LOS B or better during both peak hours.

Exhibit 2-19. 2013 Existing Freeway Element LOS

Freeway Element	Description	LOS (AM/PM)*	Density (pc/mi/ln) (AM/PM)
Mainline Segment			
North of Baseline Road	Eastbound	A/A	5.4/5.6
	Westbound	A/A	5.9/7.4
Under Baseline Road	Eastbound	A/A	4.4/4.6
	Westbound	A/A	5.1/6.0
Baseline Road to Bridge Street	Eastbound	A/A	5.3/8.6
	Westbound	A/A	9.1/7.5
Under Bridge Street	Eastbound	A/A	5.3/8.6
	Westbound	A/A	9.1/7.5
Bridge Street to Bromley Lane	Eastbound	A/A	5.3/8.6
	Westbound	A/A	9.1/7.5
Under Bromley Lane	Eastbound	A/A	4.8/7.3
	Westbound	A/A	8.2/6.7
South of Bromley Lane	Eastbound	A/B	7.8/12.4
	Westbound	B/A	14.0/10.5
Merge/Diverge Areas			
Baseline Road	Eastbound Diverge	A/B	6.1/10.4
	Eastbound Merge	A/A	4.1/4.3
	Westbound Diverge	A/A	6.0/7.8
	Westbound Merge	A/A	7.2/5.5
Bromley Lane	Eastbound Diverge	A/B	6.4/12.0
	Eastbound Merge	A/A	3.8/7.4
	Westbound Diverge	A/A	8.9/6.9
	Westbound Merge	B/A	13.0/10.0

*The LOS font color matches the colors used in the LOS figures for existing conditions.

2.8.2 Baseline Road Intersections

A summary of the operational analysis results for intersections along Baseline Road is shown in Exhibit 2-20.

- The majority of the intersection approaches along Baseline Road currently operate at LOS B or better.

The high volume of side-street traffic combined with single-lane approaches results in longer delays, queuing, and LOS E at the following locations:

- The southbound approach of the West Frontage Road during the AM and PM peak hours
- The northbound approach of the eastbound ramp intersection during the PM peak hour

Exhibit 2-20. 2013 Existing Conditions Baseline Road Intersection LOS

Intersection	Approach	LOS (AM/PM)*	Delay (sec/veh) (AM/PM)	95% Queue Length (feet) (AM/PM)
50th Avenue	Eastbound	A/A	**	**
	Westbound	A/A	7.8/8.3	25/25
	Northbound1	B/B	12.4/12.9	25/25
West Frontage Road	Eastbound	A/A	7.7/8.8	25/25
	Westbound	A/A	8.1/7.7	25/25
	Northbound1	B/C	14.6/19.9	25/50
	Southbound1	E/E	35.5/35.3	150/100
Westbound I-76 Ramps	Eastbound	A/A	**	**
	Westbound	A/A	8.9/8.0	25/25
	Southbound1	B/B	10.4/14.1	25/50
Eastbound I-76 Ramps	Eastbound	A/A	7.8/7.7	25/25
	Westbound	A/A	**	**
	Northbound1	B/E	10.9/38.5	25/275
East Frontage Road	Eastbound	A/A	**	**
	Westbound	A/A	7.4/7.7	25/25
	Northbound1	A/B	9.7/10.2	25/25
Harvest Road	Eastbound	A/A	7.9/7.4	25/25
	Westbound	A/A	7.4/7.7	0/0
	Northbound1	B/B	10.3/10.2	25/25
	Southbound1	A/A	9.4/9.3	25/25

*The LOS font color matches the colors used in the LOS figures for existing conditions

**HCM is limited in calculating delays and queue lengths for these locations

¹ Stop-controlled approach

2.8.3 Bridge Street Intersections

A summary of the results for intersections along Bridge Street is shown in Exhibit 2-21. Analysis indicates that Bridge Street is currently operating with volume levels well below the roadway capacity.

- Almost all of the intersections and approaches along Bridge Street operate at LOS B or better during both the AM and PM peak hours.
- Only the northbound approach of the West Frontage Road operates at LOS C during the PM peak hour.

Exhibit 2-21. 2013 Existing Conditions Bridge Street Intersection LOS

Intersection	Approach	LOS (AM/PM)*	Delay (sec/veh) (AM/PM)	95% Queue Length (feet) (AM/PM)
50th Avenue ²	Eastbound	B/B	11.4/17.6	50/75
	Westbound	B/B	11.9/16.8	50/50
	Northbound	B/B	15.8/19.4	50/100
	Southbound	B/B	15.4/13.4	50/50
	Overall	B/B	13.2/17.3	n/a
Prairie Falcon Parkway	Eastbound	A/A	7.7/7.9	25/25
	Westbound	A/A	7.6/7.7	0/25
	Northbound ¹	B/B	13.4/14.4	25/25
	Southbound ¹	B/B	11.8/11.8	25/25
West Frontage Road	Eastbound	A/A	7.6/7.8	25/25
	Westbound	A/A	7.5/7.6	25/25
	Northbound ¹	B/C	12.3/15.2	25/25
	Southbound ¹	B/B	10.1/10.2	25/25
East Frontage Road	Eastbound	A/A	7.5/7.4	25/25
	Westbound	A/A	7.6/7.6	25/0
	Northbound ¹	B/B	10.0/10.5	25/25
	Southbound ¹	A/A	9.3/9.7	25/25
Gun Club Road	Eastbound	A/A	7.5/7.4	0/0
	Westbound	A/A	7.4/7.5	25/0
	Northbound ¹	A/A	9.1/9.1	25/25
	Southbound ¹	A/A	9.6/9.2	0/0

* The LOS font color matches the colors used in the LOS figures for existing conditions.

¹ Stop-controlled approach

² Signalized intersection

2.8.4 Bromley Lane Intersections

The traffic volumes along Bromley Lane are higher than the other surface streets in the area. A summary of the operational analysis results for the intersections along Bromley Lane is shown in Exhibit 2-22.

- A majority of the intersections and their approaches operate at LOS C or better during both peak hours.
- A few approaches and intersections operate at LOS E/F, which indicates that users of the interchange are experiencing delay at peak hours.

The following locations operate at LOS E/F:

- The West Frontage Road roundabout is a single-lane roundabout with the highest peak-hour traffic volume on the southbound leg left turns and eastbound/westbound through-movements.
- The eastbound approach during the PM peak, and the southbound approach during the AM peak operate at LOS E. This indicates increased delays and queuing for these movements.

- The eastbound ramp junction with Bromley Lane is an all-way stop-controlled intersection, which operates at LOS F during the PM peak. The volume of northbound vehicles attempting to turn left onto Bromley Lane experience long delays, significant queuing, and poor operations.

Exhibit 2-22. 2013 Existing Conditions Bromley Lane Intersection LOS

Intersection	Approach	LOS (AM/PM)*	Delay (sec/veh) (AM/PM)	95% Queue Length (feet) (AM/PM)
50th Avenue and West Frontage Road	Eastbound	A/A	8.1/9.0	25/50
	Westbound	A/A	**	**
	Southbound ¹	C/B	18.2/10.8	150/50
Tower Road ²	Eastbound	A/A	7.9/8.5	25/25
	Westbound	A/A	7.3/8.4	25/25
	Northbound	B/B	16.7/17.3	25/50
	Southbound	B/B	15.5/15.2	0/0
	Overall	A/A	8.6/10.1	n/a
Kmart Access ²	Eastbound	B/B	13.5/12.1	50/75
	Westbound	C/C	32.9/32.0	75/125
	Southbound	B/B	14.0/17.5	0/0
	Overall	C/C	21.3/22.4	n/a
Judicial Center Drive ²	Eastbound	A/B	6.7/17.1	25/50
	Westbound	A/B	8.5/15.5	25/75
	Northbound	B/A	15.6/8.3	25/25
	Overall	A/B	7.7/14.7	n/a
Lowe's Access ²	Eastbound	B/C	10.1/23.2	25/100
	Westbound	B/B	10.2/10.4	50/75
	Northbound	B/B	13.7/18.8	25/50
	Overall	B/B	10.6/17.7	n/a
West Frontage Road ³	Eastbound	C/E	18.3/40.9	125/375
	Westbound	A/A	6.2/5.3	75/75
	Northbound	A/B	9.1/14.3	25/50
	Southbound	E/B	46.0/13.8	350/100
	Overall	D/C	25.1/21.0	n/a
Westbound I-76 Ramps	Eastbound	A/A	**	**
	Westbound	B/A	10.4/9.6	25/25
	Southbound ¹	C/C	16.4/16.7	25/25
Eastbound I-76 Ramps	Eastbound ¹	B/C	11.4/19.2	**
	Westbound ¹	C/C	18.0/15.8	**
	Northbound ¹	C/F**	18.8/>100	**
	Overall	C/F	17.2/66.4	n/a
East Frontage Road	Eastbound	A/A	8.2/7.9	25/25
	Westbound	A/A	**	**
	Southbound ¹	B/B	11.8/12.0	25/25
Picadilly Road	Eastbound	A/A	**	**
	Westbound	A/A	7.8/8.1	25/25
	Northbound ¹	B/B	13.4/12.7	25/25

* The LOS font color matches the colors used in the LOS figures for existing conditions

***HCM is limited in calculating delays and queue lengths for these locations.*

¹ *Stop-controlled approach*

² *Signalized intersection*

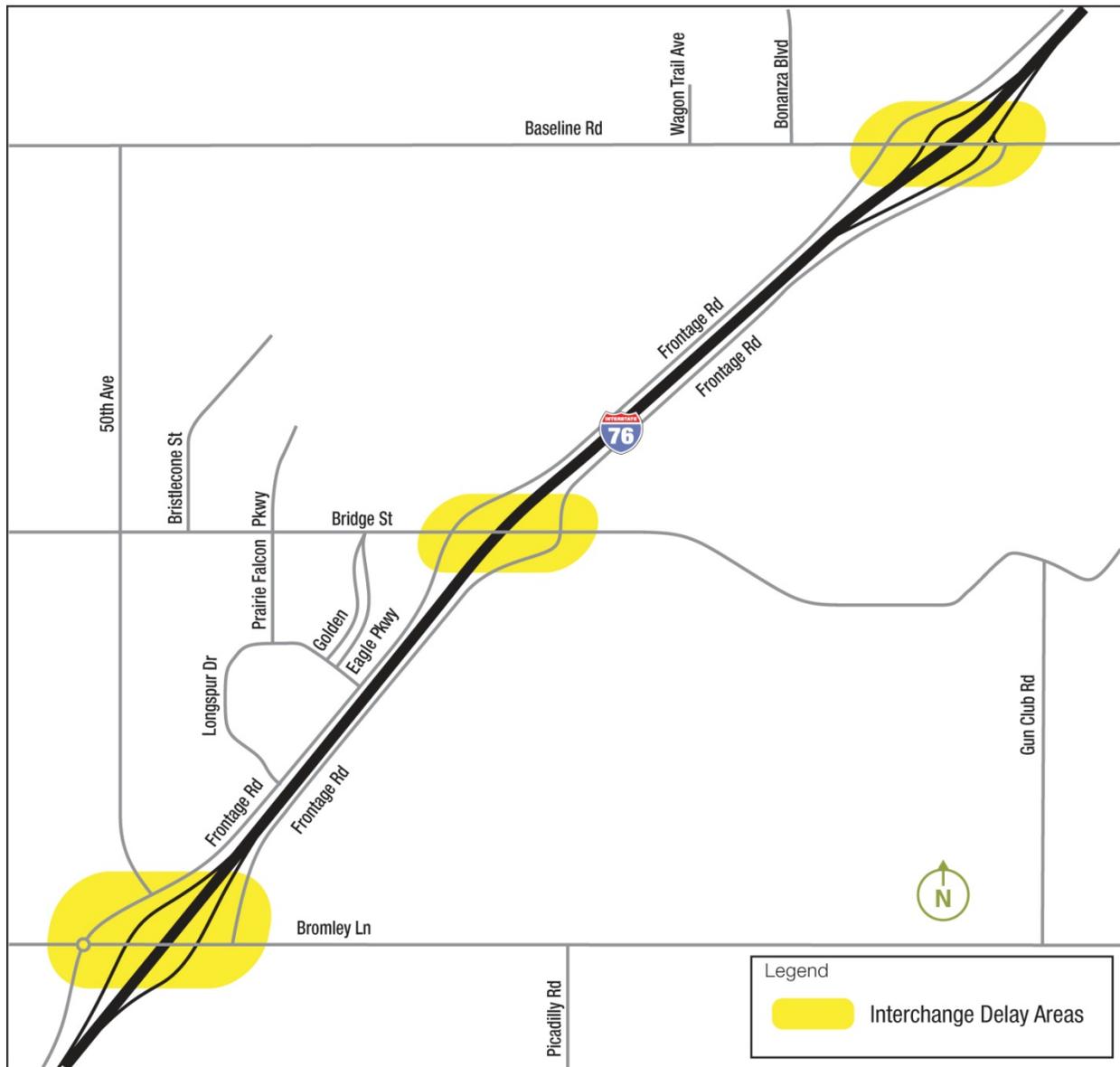
³ *Roundabout*

2.8.5 Interchange Delay Area

The amount of delay experienced by users of the transportation network as they travel through the intersections in the vicinity of I-76 or within the greater interchange areas indicates which areas may be experiencing congestion, operational issues, and increased potential for safety issues. Delay was calculated for the vehicles that use the existing Bromley Lane and Baseline Road interchange intersections and those that pass through the Bridge Street intersections near the location of the proposed interchange. The following is a list of the intersections included in the interchange area delay calculation, which are highlighted in Exhibit 2-23.

- Bromley Lane at West Frontage Road, I-76 westbound ramps, I-76 eastbound ramps, and East Frontage Road; West Frontage Road at 50th Avenue
- Bridge Street at West Frontage Road and East Frontage Road
- Baseline Road at East Frontage Road, I-76 westbound ramps, I-76 eastbound ramps, and West Frontage Road

Exhibit 2-23. Interchange Delay Area Boundaries



Interchange area delay was computed by first determining the amount of delay at each of the intersections in the identified areas. This was accomplished by multiplying the number of vehicles entering each intersection by the amount of delay per vehicle (from the HCS analysis) at the corresponding intersection.

For this analysis, the actual delay values from HCS—even those in excess of 100 seconds—were used to compute the delay by each approach to the intersections. The maximum value for several approaches exceeds the maximum threshold for HCS, indicating significant delay/congestion. The total delay for each interchange then was calculated by summing the individual intersection delays together within each interchange area. This process was completed for each of the interchanges individually and then as a system by summing the interchanges together to reach a single study area value. The results of the intersection delay analysis are shown in Exhibit 2-24.

The majority of the delay occurs at the Bromley Lane interchange, which is consistent with the higher volumes being served by this interchange and roadway.

Exhibit 2-24. 2013 Existing Conditions Interchange Area Delay

Interchange	Total Delay (vehicle-hours/day)	
	AM	PM
Baseline Road	6.4	11.5
Bridge Street	1.4	1.9
Bromley Lane	20.2	39.8
Total	28.0	53.2

2.8.6 Travel Times

Travel time, which can be impacted by traffic congestion, is a measure of effectiveness that can help identify benefits of adding the proposed interchange to the system. In existing conditions, the motorists are traveling from Bridge Street south to Bromley Lane or vice versa, to gain access to/from I-76. A new interchange will allow motorists to directly access I-76 from Bridge Street, effectively reducing overall travel times.

Existing travel patterns indicate that motorists are currently using 50th Avenue to travel between Bridge Street and Bromley Lane. This trip is shown as Route 1 and Route 2 in Exhibit 2-25.

Travel times were computed by assuming vehicles are free flowing (traveling at the speed limits) between intersections. Then, the delay at each intersection along the route was added to the free-flow time to get a total trip time. For this analysis, the delay at the intersections was limited to no more than 100 seconds per vehicle, which is near the upper limits of the HCM methodologies. Exhibit 2-26 shows the results of the existing travel time analysis for Routes 1 and 2. Under existing conditions, all trips between I-76 south of Bromley Lane and the 50th Avenue/Bridge Street intersection take more than 3.7 minutes (187 seconds) during the peak hours.

Exhibit 2-25. Peak Hour Travel Time Routes



Exhibit 2-26. 2013 Existing Conditions Travel Times

Alternative	Travel Time (seconds per vehicle)			
	Route 1		Route 2	
	AM	PM	AM	PM
2013 Existing	224	190	214	207

2.9 Summary

The 2013 existing conditions indicate several issues in the current transportation system within the study area. A solution is needed to address travel delay, distribute traffic efficiently, and support increased travel demands. The results of the analysis show:

- The majority of the transportation system operates at LOS D or better.
- Some of the transportation network elements, particularly at the Bromley Lane Interchange, are beginning to show signs of congestion and are operating at LOS E/F during the peak hours.
- Existing volumes on all segments of I-76 are well below the daily and hourly capacity levels of a four-lane freeway (192,000 vehicles per day for two-way traffic).
- The existing spacing between Bromley Lane and Baseline Road is approximately 2.75 miles. With the new interchange at Bridge Street, the spacing between Bromley Lane and Bridge Street would be 1.29 miles and between Bridge Street and Baseline Road would be 1.45 miles.

3. Description of Alternatives

This I-76 and Bridge Street EA examines potential effects to social, environmental, and economic resources resulting from proposed improvements to I-76 and Bridge Street. Consistent with federal regulations, the EA evaluates the potential for significant impacts that might result from the No-Action Alternative and the Action Alternatives. The Alternatives are discussed below. Each alternative was evaluated and compared to identify the Preferred Alternative for the project.

3.1 No-Action Alternative

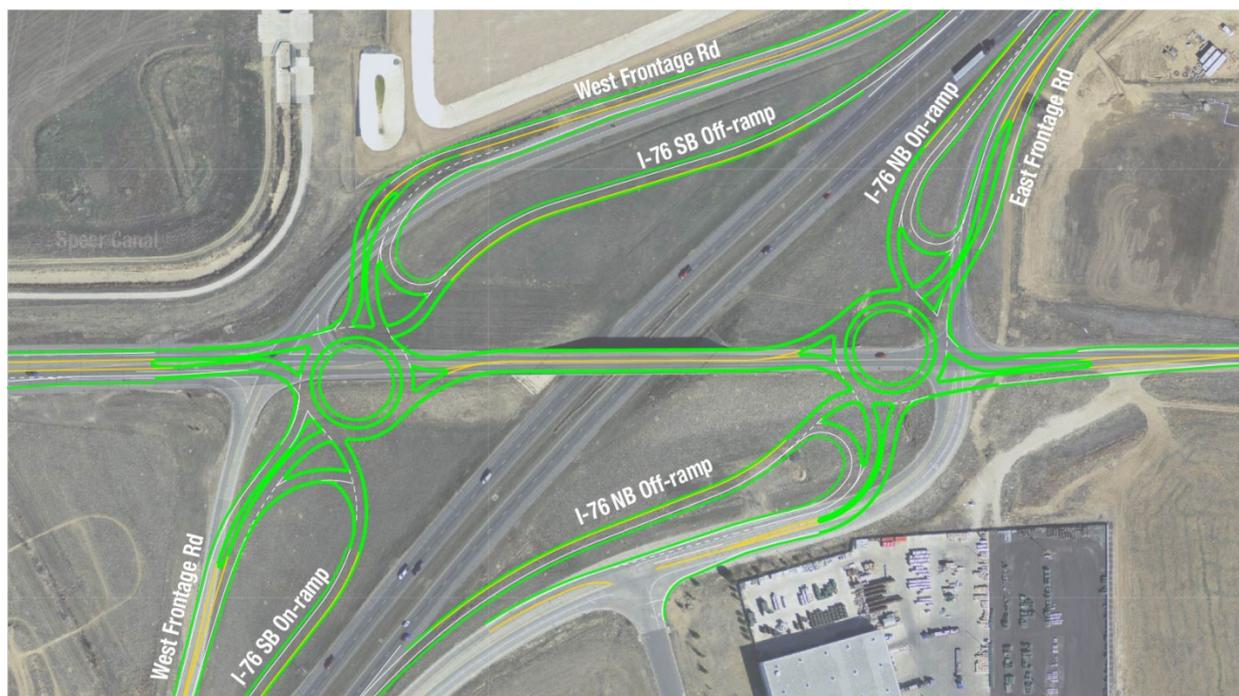
The No-Action Alternative serves as the baseline against which action alternatives are evaluated. For the purposes of this study, the No-Action Alternative is defined as the existing facilities within the study area. Under the No-Action Alternative, no further improvements, aside from ongoing operations and maintenance, will be made to the Bridge Street overpass at I-76.

3.2 Action Alternatives

Three Action Alternatives were advanced through the evaluation process. They are each discussed below, along with the one of these three alternatives that was chosen as the Preferred Alternative for this project.

3.2.1 Preferred Alternative: Two-Roundabout Interchange Design

The Preferred Alternative for this EA is the two-roundabout interchange design. This alternative combines the frontage roads and ramp terminals to make one six-legged roundabout on both the east and west sides of I-76 (see Exhibit 3-1). This alternative meets the project's purpose and need with relatively minor impacts. It preserves the existing bridge and can be designed with minimal ROW acquisition needed and no impacts to the Speer Canal to the northwest of the interchange. This alternative is expected to operate at LOS B in the year 2035. In addition, this alternative provides the driver with fewer distractions since there will be fewer signs to direct motorists, fewer conflict points, a simple single-lane roundabout, and a more cost-effective construction project versus either of the other two roundabout options.

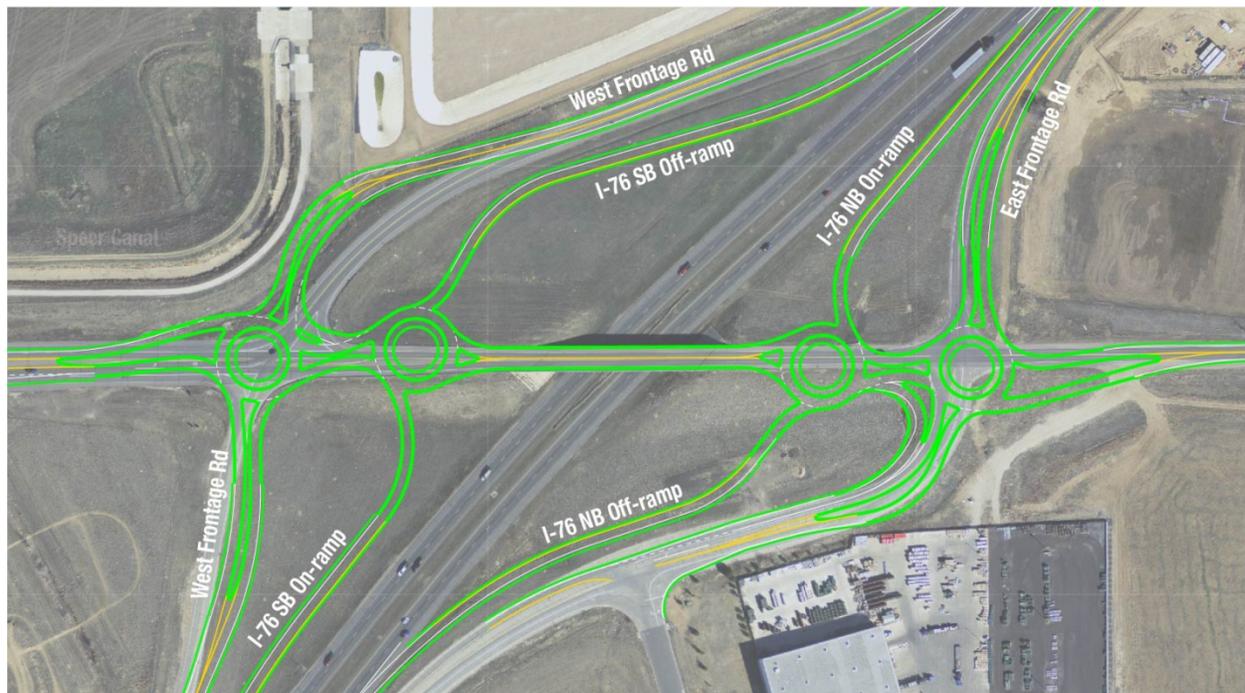
Exhibit 3-1. Preferred Alternative: Two-Roundabout Interchange Design

Each roundabout has an outside diameter of 200 feet, including a 12-foot truck apron for truck traffic. As a traffic-calming technique and to lessen ROW impacts, both roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles. Splitter islands are included to slow traffic coming into the roundabouts and provide refuge for pedestrians trying to cross Bridge Street. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. This alternative has the least amount of conflict points among the Action Alternatives.

3.2.2 Alternative 2: Four-Roundabout Interchange Design

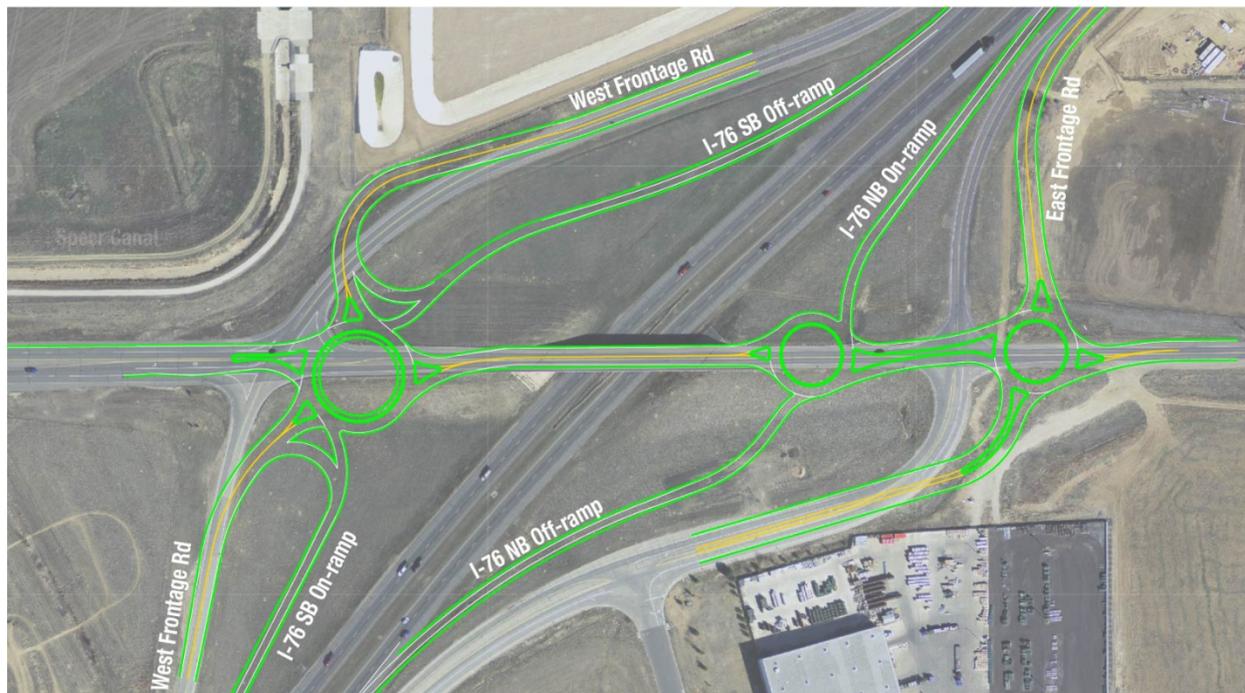
Alternative 2 for this EA is the four-roundabout interchange. Exhibit 3-2 shows this alternative, which creates two four-legged roundabouts on each side (east and west) of I-76. This alternative meets the project's purpose and need with relatively minor impacts. It preserves the existing bridge and has minor ROW impacts. This alternative is expected to operate at LOS B in the year 2035.

The two four-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 150 feet, including a 12-foot truck apron for truck traffic. As a traffic-calming technique and to lessen ROW impacts with each pairing on the west and east sides, the roundabouts have been placed slightly off center of the existing Bridge Street center line to develop approach angles. Splitter islands are included to slow traffic coming into the roundabouts and provide refuge for pedestrians trying to cross Bridge Street. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

Exhibit 3-2. Alternative 2: Four-Roundabout Interchange Design**3.2.3 Alternative 3: Three-Roundabout Interchange Design**

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76 (see Exhibit 3-3). The west frontage road and I-76 westbound ramps are combined into one six-legged roundabout with an outside diameter of 200 feet, including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one four-legged roundabout and the frontage roads into a second four-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet, including a 12-foot truck apron. This alternative meets the project's purpose and need with relatively minor impacts. It preserves the existing bridge and has minor ROW impacts, primarily to the east. The two four-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. This alternative is expected to operate at LOS B in the year 2035.

For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed off center of the existing Bridge Street center line as a traffic-calming technique and to develop approach angles. Splitter islands are included to slow traffic coming into the roundabouts and provide refuge for pedestrians trying to cross Bridge Street. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. Two roundabouts were placed on the east side since that is the side with commercial businesses and the two roundabouts would enable the truck traffic to bypass the roundabout and separate from the vehicles that want to head west on Bridge Street. Having two roundabouts on the west would require more right of way and potential impact to the channel (as seen in Alternative 2).

Exhibit 3-3. Alternative 3: Three-Roundabout Interchange Design

4. Impact Analysis

4.1 Impacts Assessment Methodology

To evaluate the impacts of adding an interchange to I-76 at Bridge Street, a series of traffic operations analyses were completed. Horizon year projected traffic volumes were developed using the DRCOG 2035 regional travel demand model that was calibrated based on 2013 existing conditions traffic data and expected development based on input from Brighton staff. The 2035 model volumes were adjusted using National Cooperative Highway Research Program (NCHRP) Report 255 techniques and then further adjusted by hand to account for local traffic movements, intersection balancing, flows through interchanges, driveways/local road access, and other factors. A complete discussion on the methods for developing the future projected traffic volumes can be found in Appendix B.

The analysis evaluated the traffic operations for the following scenarios:

- 2035 No-Action Alternative (horizon year)
- 2035 Action Alternatives (horizon year)

The analysis of existing conditions was presented in Section 2 of this Technical Memorandum, so it is not repeated here. The analysis presented in the next sections included the following steps:

Step 1: Evaluate the performance of the existing transportation network to identify baseline conditions against which future analyses can be compared.

Step 2: Obtain and refine the 2010 and 2035 DRCOG regional travel demand models, including review of socioeconomic and network assumptions.

Step 3: Run the base year 2010 DRCOG regional travel demand model.

Step 4: Prepare and run 2035 models with Action and No-Action Alternative geometrics.

Step 5: Adjust 2035 daily/hourly traffic volume forecasts from the model using observed 2013 traffic counts and techniques described in NCHRP Report 255.

Step 6: Utilize the traffic forecasts and existing Turning Movement Counts (TMC) data to estimate 2035 peak-hour TMC at key intersections.

4.2 Analysis Tools

All analyses were completed using the latest methodologies described in the Highway Capacity Manual 2010 (HCM). A detailed discussion on the methodologies and analysis tools used to complete the evaluation of existing and all future conditions can be found in the Traffic Operations Methodology Memorandum in Appendix A.

The latest version of HCS was used to evaluate all elements of the transportation network. The Junctions 8 roundabout design and capacity analysis software, which incorporates the ARCADY roundabout evaluation model that is based upon HCM methodologies, was used to evaluate operations for all roundabouts at the proposed interchange and any location with more than four entering legs.

Existing four-leg roundabouts and mitigation measures of existing intersections were evaluated with HCS. Typically, traffic signals are optimized every three to five years based on traffic volume growth. The analysis of future conditions used the signal optimization tool within HCS to optimize traffic signals that operated at LOS E/F before additional mitigation measures were evaluated. The cycle lengths that were optimized were reviewed to ensure that they were reasonable and consistent with the existing corridor cycle lengths.

4.3 Results of the Traffic Analysis

An operational analysis was completed for the 2035 No-Action Alternative and the Action Alternatives using the projected traffic volume data and the methodologies previously discussed. The following subsections discuss the result of the analysis for Action and No- Action Alternatives.

4.3.1 No-Action Alternative

The No-Action Alternative serves as the baseline against which Action Alternatives are evaluated. For the purposes of this study, the No-Action Alternative is defined as the existing facilities within the study area. Under the No-Action Alternative, no further improvements, aside from ongoing operations and maintenance, will be made to the Bridge Street overpass at I-76.

Average Daily Traffic Volumes

The following is a summary of the projected 2035 No-Action Alternative daily and peak-hour ADT volumes, which are summarized in Exhibit 4-1, Exhibit 4-2, and Exhibit 4-3.

Baseline Road

In 2035, volumes on Baseline Road will be nearly 30 percent of the daily capacity (34,000 vpd for a two-lane bridge) and peak-hour volumes will reach about 60 percent of the hourly capacity levels (1,400 vph). (See Exhibit 4-1.)

Bridge Street

Traffic volumes on Bridge Street are not expected to increase significantly by 2035. Daily and hourly peak volumes are well below capacity levels. (See Exhibit 4-2.)

Bromley Lane

In 2035, traffic volumes over I-76 will represent about 50 percent of the daily estimated capacity of the structure. The volumes will exceed the structure's capacity during the peak hours. (See Exhibit 4-3.)

I-76

In 2035, all sections of I-76 north of Bromley Lane will continue to operate well below the daily and hourly capacity of the freeway. The segment of I-76 that is south of Bromley Lane is well below the daily capacity, but will operate at between 60 percent and 75 percent of its hourly capacity during the peak hours.

Frontage Roads

The frontage roads are expected to experience minimal growth between 2013 and 2035. The section of the West Frontage Road between Bromley Lane and 50th Avenue will continue to have higher volumes than the rest of the frontage road segments, due to the heavy movement of vehicles going to/from I-76 and the developments along 50th Avenue between Bromley Lane and Bridge Street.

50th Avenue

50th Avenue will experience 75 percent growth in traffic south of Bridge Street as vehicles continue to use this route to get to/from the Bromley Lane interchange and their ultimate destinations to the south of Brighton. This growth also is consistent with planned residential development in the northwest corner of Bridge Street and I-76.

Vehicle Classification

For the purposes of this analysis, the future truck percentages were assumed to remain the same as those measured in 2013.

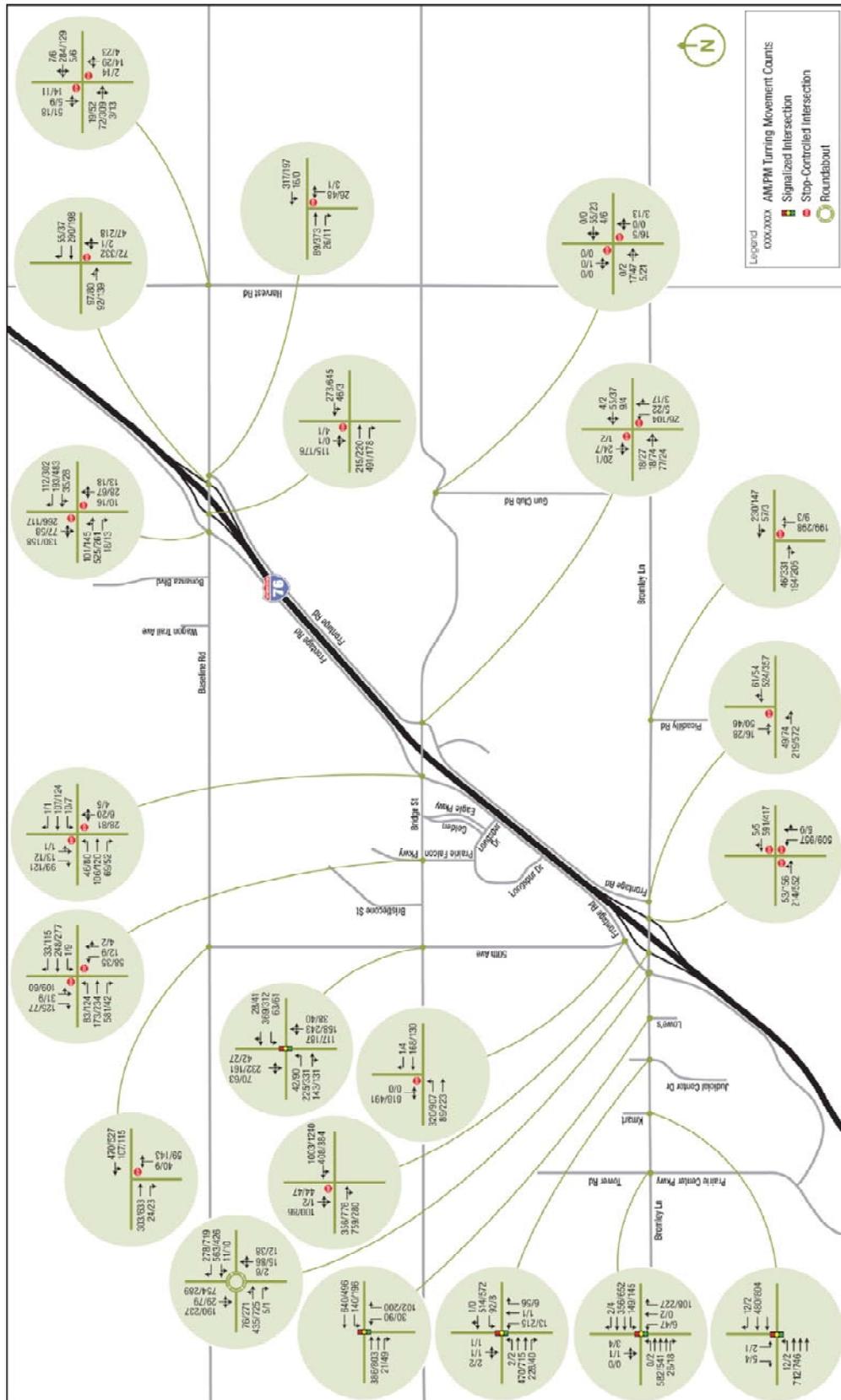
Peak-Hour Turning Movement Counts

After the peak-hour link volumes were projected, the peak-hour TMCs were determined using the NCHRP Report 255 methodology and the existing 2013 turning movement percentages. The projected 2035 Action Alternatives TMC data used for the analysis are shown in Exhibit 4-4.

Operation Analysis

The overall results of the LOS analysis for 2035 No-Action Alternative conditions are shown in Exhibit 4-5 and Exhibit 4-6, and described in more detail in the following sections.

Exhibit 4-4. 2035 No-Action Alternative Peak-Hour Turning Movement Counts



I-76 Freeway Elements

The operational analysis results for the 2035 No-Action Alternative freeway elements are shown in Exhibit 4-7. The density in all segments increases along with traffic volumes between 2013 and 2035. The majority of the basic freeway segments and ramp merge/diverge areas operate at LOS B or better during both peak hours, with the following exceptions:

- Westbound I-76 south of Bromley Lane operates at LOS D in the AM peak hour compared to LOS B in 2013.
- Eastbound I-76 south of Bromley Lane is LOS C in the PM peak hour.
- The Bromley Lane to Westbound I-76 merge area operates at LOS C in the AM peak.

Baseline Road Intersections

A summary of the LOS results for intersections along Baseline Road for the 2035 No-Action Alternative are shown in Exhibit 4-8. The majority of intersection approaches will operate at LOS C or better in 2035, with the following exceptions:

- The northbound and southbound approaches of the West Frontage Road will operate at LOS E/F in the AM and PM peak hours. The volumes on Baseline Road reduce the number of available gaps for the vehicles attempting to turn left from the Frontage Road onto Baseline Road and will result in increased delays and queues on these approaches:
- The northbound approach of the I-76 eastbound ramp intersection will operate at LOS F in the PM peak hour. The stop-controlled approach will result in increased delays and queues.
- The eastbound off-ramp queues are expected to be 1250 feet in the PM peak hour, compared to 275 feet in the existing conditions PM peak hour. The eastbound off-ramp is approximately 1500 feet long, so spillback of the queue onto mainline I-76 is not expected to occur.

Exhibit 4-7. 2035 No-Action Alternative Freeway Element LOS

Freeway Element	Description	2013 Existing (AM/PM)		2035 No-Action (AM/PM)	
		LOS*	Density (pc/mi/ln)	LOS*	Density (pc/mi/ln)
Mainline Segment					
North of Baseline Road	Eastbound	A/A	5.4/5.6	A/B	7.5/11.8
	Westbound	A/A	5.9/7.4	B/A	13.2/9.7
Under Baseline Road	Eastbound	A/A	4.4/4.6	A/A	6.3/10.8
	Westbound	A/A	5.1/6.0	B/A	12.2/8.1
Baseline Road to Bridge Street	Eastbound	A/A	5.3/8.6	A/B	7.2/15.2
	Westbound	A/A	9.1/7.5	B/A	16.7/9.7
Under Bridge Street	Eastbound	A/A	5.3/8.6	A/B	7.2/15.2
	Westbound	A/A	9.1/7.5	B/A	16.7/9.7
Bridge Street to Bromley Lane	Eastbound	A/A	5.3/8.6	A/B	7.2/15.2
	Westbound	A/A	9.1/7.5	B/A	16.7/9.7
Under Bromley Lane	Eastbound	A/A	4.8/7.3	A/B	6.8/13.9
	Westbound	A/A	8.2/6.7	B/A	15.5/8.5
South of Bromley Lane	Eastbound	A/B	7.8/12.4	A/C	10.9/22.0
	Westbound	B/A	14.0/10.5	D/B	26.8/14.3
Merge/Diverge Areas					
Baseline Road Interchange	Eastbound Diverge	A/B	6.1/10.4	A/B	8.5/18.7
	Eastbound Merge	A/A	4.1/4.3	A/B	6.4/11.0
	Westbound Diverge	A/A	6.0/7.8	B/B	14.8/10.5
	Westbound Merge	A/A	7.2/5.5	B/A	15.5/8.0
Bromley Lane Interchange	Eastbound Diverge	A/B	6.4/12.0	A/B	5.9/18.8
	Eastbound Merge	A/A	3.8/7.4	A/B	5.9/14.7
	Westbound Diverge	A/A	8.9/6.9	B/A	18.1/9.6
	Westbound Merge	B/A	13.0/10.0	C/B	25.2/14.5

*Note: The LOS font color matches the colors used in the LOS figures

Exhibit 4-8. 2035 No-Action Alternative Baseline Road Intersection LOS

Intersection	Approach	2013 Existing (AM/PM)			2035 No-Action (AM/PM)		
		LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
50th Avenue	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	7.8/8.3	25/25	A/A	8.4/9.8	25/25
	Northbound ¹	B/B	12.4/12.9	25/25	C/C	18.7/20.7	50/75
West Frontage Road	Eastbound	A/A	7.7/8.8	25/25	A/B	8.3/10.7	25/25
	Westbound	A/A	8.1/7.7	25/25	A/A	8.8/7.9	25/25
	Northbound ¹	B/C	14.6/19.9	25/50	E/F**	44.0/>100	50/425
	Southbound ¹	E/E	35.5/35.3	150/100	F**/F**	>100/>100	4125/3250
Westbound I-76 Ramps	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	8.9/8.0	25/25	A/A	9.6/8.3	25/25
	Southbound ¹	B/B	10.4/14.1	25/50	B/C	11.8/20.7	25/75
Eastbound I-76 Ramps	Eastbound	A/A	7.8/7.7	25/25	A/A	8.6/8.1	25/25
	Westbound	A/A	**	**	A/A	**	**
	Northbound ¹	B/E	10.9/38.5	25/275	C/F**	16.4/>100	50/1250
East Frontage Road	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	7.4/7.7	25/25	A/A	7.6/8.4	25/25
	Northbound ¹	A/B	9.7/10.2	25/25	B/B	12.3/14.5	25/25
Harvest Road	Eastbound	A/A	7.9/7.4	25/25	A/A	8.5/7.7	25/25
	Westbound	A/A	7.4/7.7	0/0	A/A	7.5/8.1	25/25
	Northbound ¹	B/B	10.3/10.2	25/25	B/B	13.0/14.5	25/25
	Southbound ¹	A/A	9.4/9.3	25/25	B/B	12.5/12.7	25/25

*Note: The LOS font color matches the colors used in the LOS figures

**HCM is limited in calculating delays and queue lengths for these locations

¹Stop-controlled approach

Bridge Street Intersections

A summary of the 2035 No-Action Alternative operational results for the intersections along Bridge Street is provided in Exhibit 4-9. Almost all intersections and approaches along Bridge Street will operate at LOS D or better in the 2035 No-Action Alternative AM and PM peak hours, with the following exceptions:

- The northbound approach of 50th Avenue will operate at LOS F with increased queues during the PM peak. This is due to the high volume of left-turning traffic using 50th Avenue from the Bromley Lane interchange to access westbound Bridge Street.
- The overall intersection operations at 50th Avenue during the PM peak will degrade from LOS B in 2013 to LOS F in 2035.

Exhibit 4-9. 2035 No-Action Alternative Bridge Street Intersection LOS

Intersection	Approach	2013 Existing (AM/PM)			2035 No-Action (AM/PM)		
		LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
50th Avenue ¹	Eastbound	B/B	11.4/17.6	50/75	C/E	27.5/60.6	150/425
	Westbound	B/B	11.9/16.8	50/50	C/D	32.9/39.0	175/275
	Northbound	B/B	15.8/19.4	50/100	C/F**	27.1/>100	125/775
	Southbound	B/B	15.4/13.4	50/50	B/C	19.6/28.2	100/150
	Overall	B/B	13.2/17.3	n/a	C/F**	27.3/>100	n/a
Prairie Falcon Parkway	Eastbound	A/A	7.7/7.9	25/25	A/A	8.2/8.5	25/25
	Westbound	A/A	7.6/7.7	0/25	A/A	7.8/7.8	0/25
	Northbound ²	B/B	13.4/14.4	25/25	D/D	31.3/27.7	50/25
	Southbound ²	B/B	11.8/11.8	25/25	C/C	22.3/17.7	100/50
West Frontage Road	Eastbound	A/A	7.6/7.8	25/25	A/A	7.7/7.9	25/25
	Westbound	A/A	7.5/7.6	25/25	A/A	7.6/7.6	25/25
	Northbound ²	B/C	12.3/15.2	25/25	B/C	14.2/16.5	25/50
	Southbound ²	B/B	10.1/10.2	25/25	B/B	10.2/10.4	25/25
East Frontage Road	Eastbound	A/A	7.5/7.4	25/25	A/A	7.5/7.4	25/25
	Westbound	A/A	7.6/7.6	25/0	A/A	7.6/7.6	25/25
	Northbound ²	B/B	10.0/10.5	25/25	B/B	10.3/10.9	25/25
	Southbound ²	A/A	9.3/9.7	25/25	A/B	10.0/10.5	25/25
Gun Club Road	Eastbound	A/A	7.5/7.4	0/0	A/A	7.5/7.4	0/0
	Westbound	A/A	7.4/7.5	25/0	A/A	7.4/7.5	25/25
	Northbound ²	A/A	9.1/9.1	25/25	A/A	9.3/9.0	25/25
	Southbound ²	A/A	9.6/9.2	0/0	A/A	9.1/9.1	25/25

*Note: The LOS font color matches the colors used in the LOS figures

**HCM is limited in calculating delays and queue lengths for these locations

¹Signalized intersection

²Stop-controlled approach

Bromley Lane Intersections

A summary of the results for the intersections along Bromley Lane is shown in Exhibit 4-10. The projected traffic volume being processed by the intersections will result in increasing levels of congestion and LOS E/F at several intersections.

- The southbound approach of 50th Avenue at the West Frontage Road will degrade from LOS B/C in 2013 to LOS F/F in 2035.
- The southbound approach at the westbound ramps will degrade to LOS F/F in the peak hours. The westbound approach of Bromley Lane will operate at LOS E in the AM peak hour at this location.
- Queues between the closely spaced intersections along Bromley Lane will continue to create additional operational and safety issues. Ramp queuing will spillback onto mainline I-76 which will impact I-76 safety and operations.

- The roundabout at the West Frontage Road will degrade in operations to LOS F in both the AM and PM peak hours. Operations of 50th Avenue and the West Frontage Road will be negatively affected by queuing that will spill back from the roundabout.
- All of the approaches and the overall intersection at the eastbound I-76 ramps will operate at LOS F in both the AM and PM peak hours. The operations at this intersection will cause queues to spillback onto mainline I-76 which will impact I-76 safety and operations.

The results of the HCS analysis are meant for comparative purposes only, realizing that when the volume-capacity ratio exceeds 1, the results are not as reliable.

Exhibit 4-10. 2035 No-Action Alternative Bromley Lane Intersection LOS

Intersection	Approach	2013 Existing (AM/PM)			2035 No-Action (AM/PM)		
		LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
50th Avenue and West Frontage Road	Eastbound	A/A	8.1/9.0	25/50	A/B	8.8/12.8	50/175
	Westbound	A/A	**	**	A/A	**	**
	Southbound ¹	C/B	18.2/10.8	150/50	F**/F	>100/97.4	3250/625
Tower Road ²	Eastbound	A/A	7.9/8.5	25/25	B/B	12.5/13.9	50/50
	Westbound	A/A	7.3/8.4	25/25	B/B	12.0/13.9	50/75
	Northbound	B/B	16.7/17.3	25/50	B/B	15.2/16.1	25/50
	Southbound	B/B	15.5/15.2	0/0	B/B	13.9/13.1	0/0
	Overall	A/A	8.6/10.1	n/a	B/B	12.5/14.3	n/a
Kmart Access ²	Eastbound	B/B	13.5/12.1	50/75	A/A	7.4/8.6	25/50
	Westbound	C/C	32.9/32.0	75/125	B/C	14.0/21.0	50/125
	Southbound	B/B	14.0/17.5	0/0	B/B	12.4/18.1	0/0
	Overall	C/C	21.3/22.4	n/a	B/B	10.1/15.0	n/a
Judicial Center Drive ²	Eastbound	A/B	6.7/17.1	25/50	A/B	7.1/16.8	25/75
	Westbound	A/B	8.5/15.5	25/75	A/B	6.8/17.7	25/125
	Northbound	B/A	15.6/8.3	25/25	B/B	15.2/11.3	25/50
	Overall	A/B	7.7/14.7	n/a	A/B	7.1/16.2	n/a
Lowe's Access ²	Eastbound	B/C	10.1/23.2	25/100	B/B	13.0/18.5	50/125
	Westbound	B/B	10.2/10.4	50/75	B/B	14.0/14.8	125/100
	Northbound	B/B	13.7/18.8	25/50	B/B	12.9/16.9	25/50
	Overall	B/B	10.6/17.7	n/a	B/B	13.6/16.9	n/a
West Frontage Road ³	Eastbound	C/E	18.3/40.9	125/375	F**/F**	>100/>100	650/1450
	Westbound	A/A	6.2/5.3	75/75	B/C	14.1/20.6	150/150
	Northbound	A/B	9.1/14.3	25/50	C/E	17.2/37.3	25/100
	Southbound	E/B	46.0/13.8	350/100	F**/F	>100/71.0	1750/450
	Overall	D/C	25.1/21.0	n/a	F**/F**	>100/>100	n/a
Westbound I-76 Ramps	Eastbound	A/A	**	**	A/A	**	**
	Westbound	B/A	10.4/9.6	25/25	E/C	48.3/22.3	350/150
	Southbound ¹	C/C	16.4/16.7	25/25	F**/F**	>100/>100	n/a
Eastbound I-76 Ramps	Eastbound ¹	B/C	11.4/19.2	**	C/F**	23.1/>100	**
	Westbound ¹	C/C	18.0/15.8	**	F**/F	>100/54.5	**
	Northbound ¹	C/F ⁴	18.8/>100	**	F**/F**	>100/>100	**
	Overall	C/F	17.2/66.4	n/a	F**/F ⁴	>100/>100	n/a
East Frontage Road	Eastbound	A/A	8.2/7.9	25/25	A/A	9.1/8.5	25/25
	Westbound	A/A	**	**	A/A	**	**
	Southbound ¹	B/B	11.8/12.0	25/25	C/D	19.6/27.0	25/50
Picadilly Road	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	7.8/8.1	25/25	A/A	8.2/8.8	25/25
	Northbound ¹	B/B	13.4/12.7	25/25	D/D	26.8/33.7	125/175

*Note: The LOS font color matches the colors used in the LOS figures
 **HCM is limited in calculating delays and queue lengths for these locations
¹Stop-controlled approach
²Signalized intersection
³Roundabout

Interchange Area Delay

The results of the 2035 No-Action Alternative interchange delay analysis are shown in Exhibit 4-11. Total delay will increase significantly over the 2013 levels due to the increase in traffic volumes projected to use the roadway network.

- The Bromley Lane interchange area will still account for more than half of the overall delay.
- The minimal traffic growth will result in minimal increases in delay along Bridge Street.

The results of the delay analysis are a clear indication that drivers using the existing interchanges to access Brighton will experience increased delays and queues.

Exhibit 4-11. 2035 No-Action Alternative Interchange Area Delay

Alternative	Interchange	Total Delay (vehicle-hours)	
		AM	PM
2013 Existing	Baseline Road	6.4	11.5
	Bridge Street	1.4	1.9
	Bromley Lane	20.2	39.8
	Total	28.0	53.2
2035 No-Action	Baseline Road	442.3	486.2
	Bridge Street	1.8	3.7
	Bromley Lane	666.1	996.3
	Total	1,110.2	1,486.2

Travel Times

As traffic volume grows between 2013 and 2035, so will the amount of delay at many of the intersections in the study area, as indicated by the results of the operational and delay analyses. Without additional access to I-76 at Bridge Street, the preferred routes used by motorists to circulate through the area will experience increased trip times. Exhibit 4-12 shows the results of the travel time analysis using the same routes.

- Travel times in the AM and PM increase by as much as 200 seconds per vehicle.

Exhibit 4-12. 2035 No-Action Alternative Travel Times*

Alternative	Travel Time (seconds per vehicle)			
	Route 1		Route 2	
	AM	PM	AM	PM
2013 Existing	224	190	214	207
2035 No-Action	376	377	412	423

* Refer to Exhibit 26 for a description of the routes.

Summary

The 2035 No-Action Alternative indicates:

- An increase in the number of transportation elements that will operate at LOS E/F
- An increase in delays and queues that motorists will experience

- In 2035, Ramp queues may back onto I-76, creating safety and operational issues
- Travel times between the Bromley Lane interchange and the intersection of 50th Avenue and Bridge Street will increase by as much as 200 seconds per vehicle
- The structure at Bromley Lane will need to be reconstructed by the year 2025 to include widening if the Bridge Street interchange is not constructed.

4.3.2 2035 Action Alternatives

The following section describes the expected changes to the transportation network operations with the proposed interchange at Bridge Street in 2035.

Traffic Data

The projected traffic volumes for the 2035 Action Alternatives were developed by running the 2035 DRCOG regional travel demand model with a full interchange at Bridge Street. Adjustments to the volumes then were completed based on the procedures previously discussed.

Average Daily Traffic Volumes

With the addition of the proposed interchange, traffic will be redistributed from the Bromley Lane and Baseline Road interchanges to the Bridge Street interchange. Projected traffic volumes in the area of influence are summarized in the following section and in Exhibit 4-13, Exhibit 4-14, and Exhibit 4-15.

Baseline Road

Baseline Road will experience only slightly decreased volumes with the proposed interchange in 2035 compared to the No-Action Alternative. Traffic over I-76 will be less than 30 percent of daily capacity levels and less than 60 percent of the hourly volume capacities.

Bridge Street

With the addition of the proposed interchange, traffic volumes on Bridge Street will increase, with the overpass carrying 6,700 vehicles per day. This is an increase of more than 4,000 vpd, but still is only about 20 percent of the estimated daily capacity of a two-lane structure. The peak-hour volumes will be about 60 percent of the capacity for the structure.

Bromley Lane

The proposed interchange will result in decreased volumes on Bromley Lane compared to the 2035 No-Action Alternative volumes. The volume on the structure will be about 40 percent of the daily capacity (down by more than 10 percent), but the peak-hour volumes will continue to exceed capacity values. The majority of traffic that is expected to use the Bridge Street interchange is traffic that currently uses the Bromley Lane interchange.

I-76

The proposed interchange is expected to change traffic distribution along I-76 between Bromley Lane and Baseline Road. The proposed interchange will result in less traffic using the ramps at Bromley Lane and instead using the new ramps at Bridge Street to access the local transportation system.

All segments of I-76 will continue to operate below daily capacity levels. The segments south of Bromley Lane will continue to be about 75 percent of hourly capacity and the segment between Bromley Lane and Bridge Street will now serve about 60 percent of its hourly capacity.

Frontage Roads

The frontage road volumes will be lower than the 2035 No-Action Alternative levels, as vehicles are now able to directly access Bridge Street from I-76. The section of the West Frontage Road between Bromley Lane and 50th Avenue will have a volume that is about 6,000 vehicles per day less than the No-Action Alternative.

50th Avenue

50th Avenue traffic volumes will decrease, especially south of Bridge Street. This change in traffic volumes is consistent with vehicles using the Bridge Street interchange instead of the Bromley Lane interchange to gain access to/from I-76.

Peak-Hour Turning Movement Counts

After the peak-hour link volumes were projected, the peak-hour TMCs were determined using the NCHRP Report 255 methodology and the existing 2013 turning movement percentages. The projected 2035 Action Alternative TMC data used for the analysis are shown in Exhibit 4-16 and Exhibit 4-17.

Vehicle Classification

For the purposes of this analysis, the future truck percentages were assumed to remain the same as those measured in 2013.

Results of Operational Analysis

An operational analysis was completed for the 2035 Action Alternatives using the projected traffic volume data and the methodologies previously discussed. The overall results of the LOS analysis and the comparison to 2035 No-Action Alternative values are shown in Exhibit 4-18 and Exhibit 4-19 and described in more detail in the following sections.

Exhibit 4-13. 2035 Action Alternatives Daily and Peak-Hour Traffic Volumes at Baseline Road

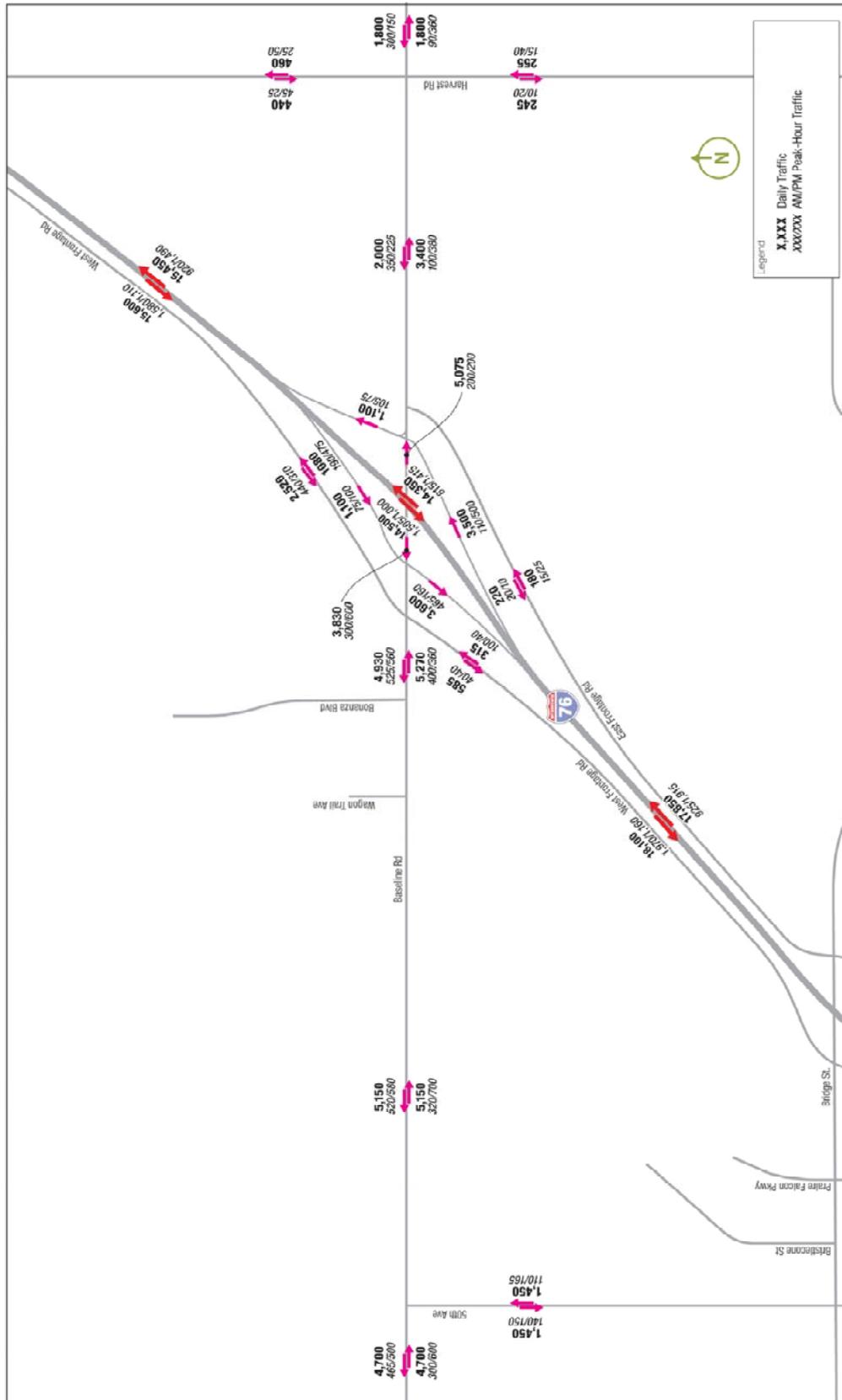


Exhibit 4-14. 2035 Action Alternatives Daily and Peak-Hour Traffic Volumes at Bridge Street

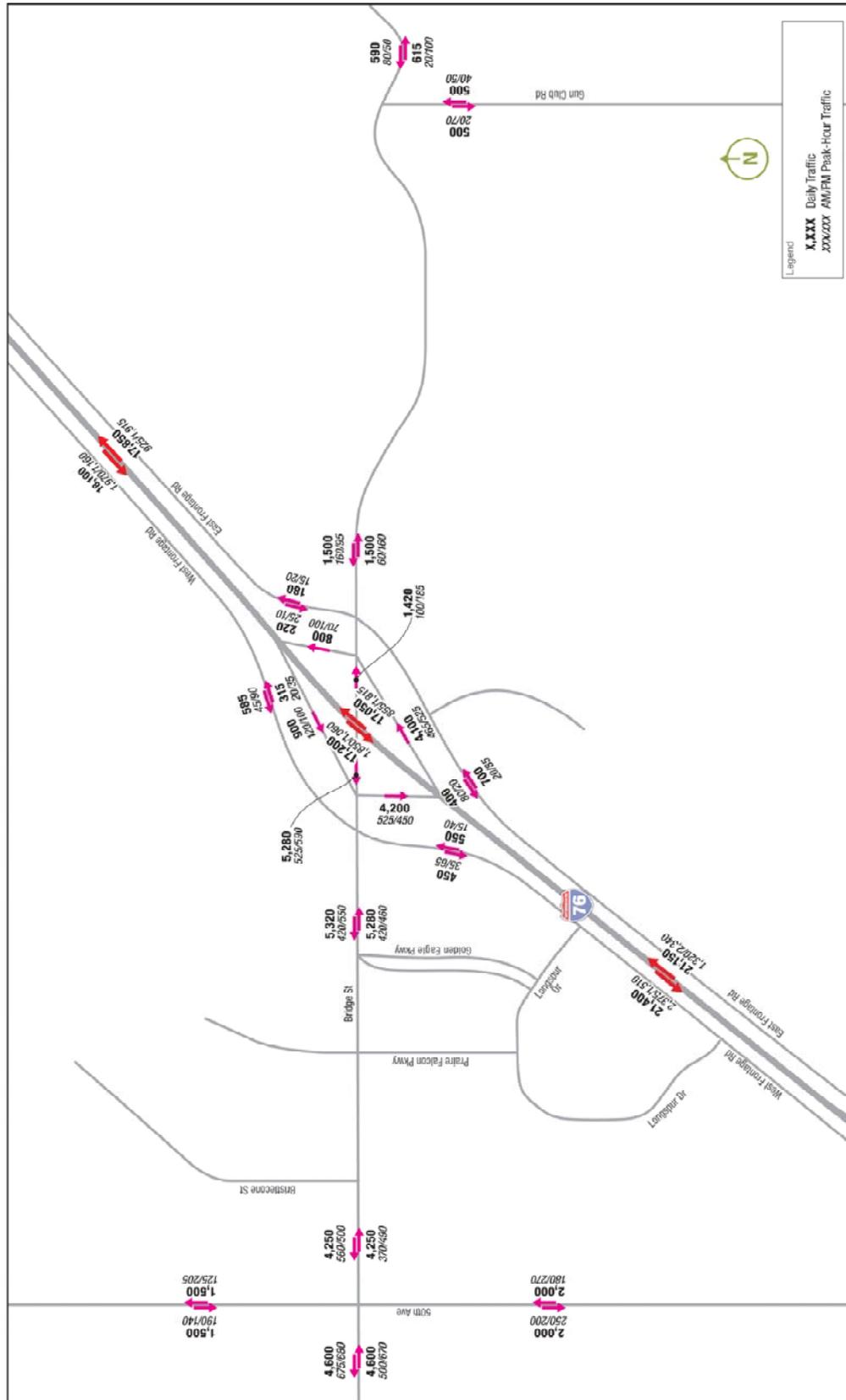


Exhibit 4-15. 2035 Action Alternatives Daily and Peak-Hour Traffic Volumes at Bromley Lane

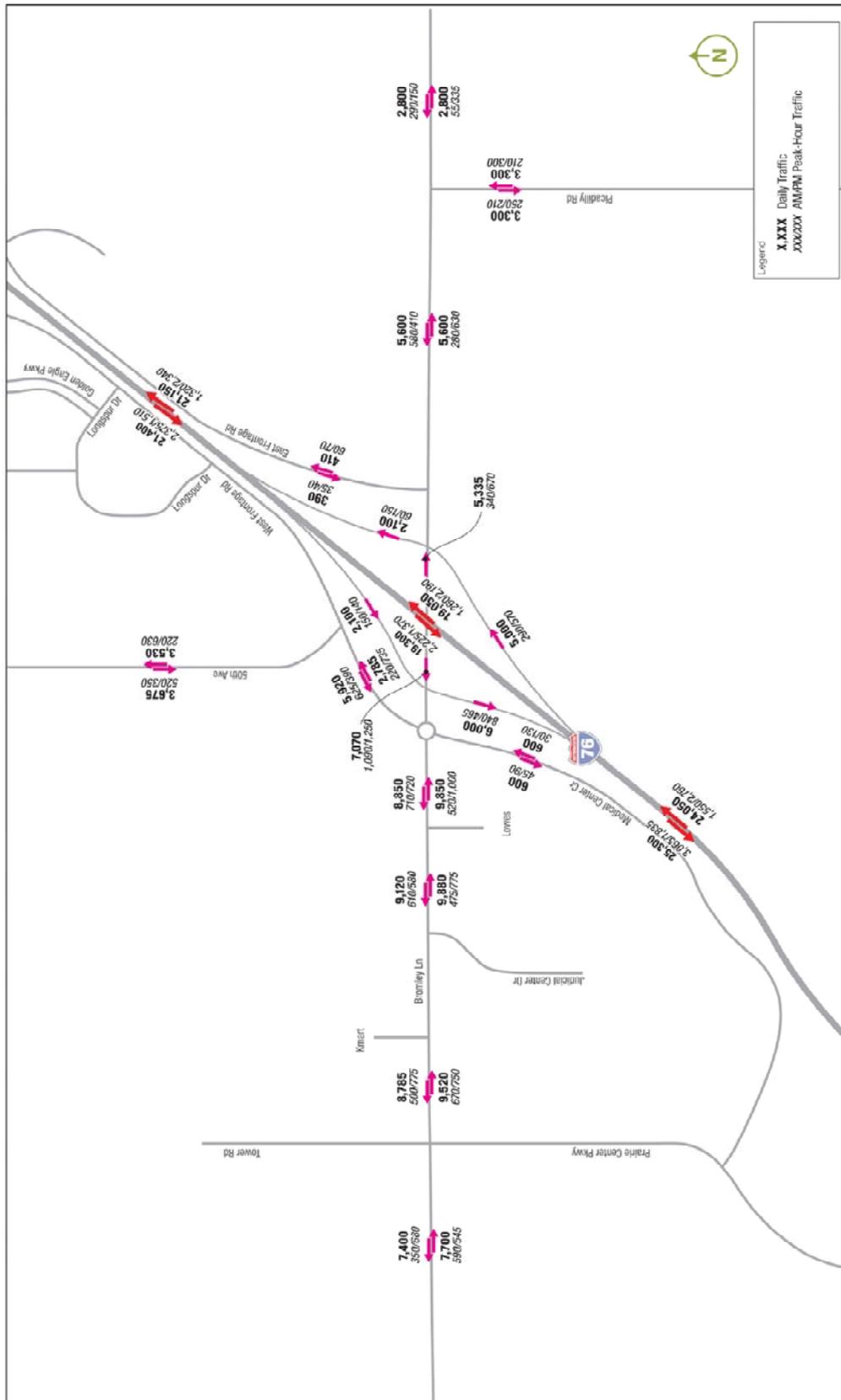


Exhibit 4-17. 2035 Action Alternatives Peak-Hour Turning Movement Counts at Bridge Street Interchange

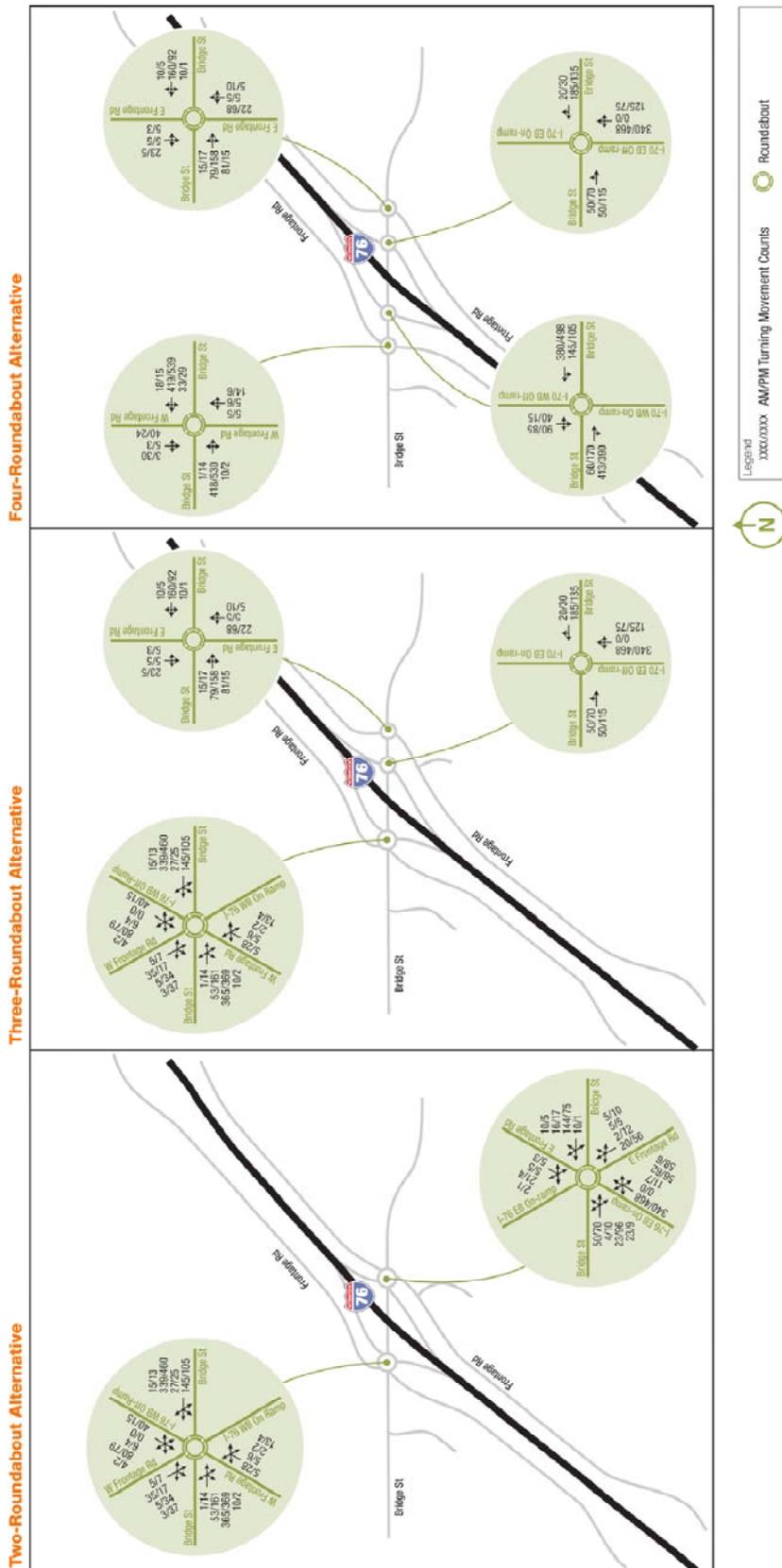


Exhibit 4-18. 2035 Action Alternatives AM LOS



Exhibit 4-19. 2035 Action Alternatives PM LOS



Freeway Elements

The analysis results for the 2035 Action Alternatives freeway elements are shown in Exhibit 4-20.

- The majority of the basic freeway segments and ramp merge/diverge areas operate at LOS C or better during both peak hours.
- The addition of the proposed interchange does result in more LOS C operations of the freeway elements between Bromley Lane and Bridge Street due to the increased traffic volumes using the facilities. However, the differences in density are minor; for example westbound I-76 between Bridge Street and Bromley Lane would change from 15.2 pc/mi/ln (LOS B) to 18.7 pc/mi/ln (LOS C). This is typical for all of the segments that change from LOS B to LOS C and from LOS A to LOS B, with the maximum increase in density being 4.3 pc/mi/ln. Several of the segments see small improvements, which are not enough to change to a better LOS, but are reflected in the lower densities of some of the segments. The biggest improvement is on westbound I-76 under Bridge Street, which sees a 1.2 pc/mi/ln reduction. The proposed interchange meets the purpose and need of the project and benefits include shorter travel times and longer life for the bridge structure at Bromley Lane.

Baseline Road Intersections

A summary of the operational results for intersections along Baseline Road are shown in Exhibit 4-21. Based on the results of the analysis:

- The addition of the Bridge Street interchange does not result in the operational degradation of any additional transportation elements compared to the No-Action Alternative. The overall number of transportation elements operating at LOS E/F is less than the 2035 No-Action Alternative.
- The overall magnitude of the delays and queues at all elements will improve.
- The northbound approach of the West Frontage Road will operate at LOS C/E in the AM and PM peak hours, which is an improvement from the LOS E/F operations in the 2035 No-Action Alternative. Queues in the PM peak hour are expected to decrease from 425 feet to 50 feet.
- The southbound approach of the West Frontage Road will continue to operate at LOS F in the AM and PM peak hours. However, when compared to the 2035 No-Build Alternative, queues are expected to decrease from 4125 feet to 2675 feet in the AM peak hour and from 3250 feet to 1550 feet in the PM peak hour.
- The northbound approach of the eastbound I-76 off-ramp will operate at LOS F during the PM peak hour, although it is an improvement from over 100 sec/veh of delay in the 2035 No-Build Alternative to 64.4 sec/veh of delay. When compared to the 2035 No-Build Alternative, queues are expected to decrease from 1250 feet to 500 feet in the PM peak hour.

Exhibit 4-20. 2035 Action Alternatives Freeway Element LOS

Freeway Element	Description	2035 No-Action (AM/PM)		2035 Action (AM/PM)	
		LOS*	Density (pc/mi/ln)	LOS*	Density (pc/mi/ln)
Mainline Segments					
I-76 North of Baseline Road	Eastbound	A/B	7.5/11.8	A/B	7.4/11.9
	Westbound	B/A	13.2/9.7	B/A	13.2/9.7
I-76 Under Baseline Road	Eastbound	A/A	6.3/10.8	A/B	6.6/11.3
	Westbound	B/A	12.2/8.1	B/A	12.6/8.7
I-76 Baseline Road to Bridge Street	Eastbound	A/B	7.2/15.2	A/B	7.5/15.2
	Westbound	B/A	16.7/9.7	B/A	16.5/10.1
I-76 Under Bridge Street	Eastbound	A/B	7.2/15.2	A/B	6.9/14.4
	Westbound	B/A	16.7/9.7	B/A	15.5/9.3
I-76 Bridge Street to Bromley Lane	Eastbound	A/B	7.2/15.2	A/C	10.7/18.7
	Westbound	B/A	16.7/9.7	C/B	20.0/13.2
I-76 Under Bromley Lane	Eastbound	A/B	6.8/13.9	A/B	10.2/17.4
	Westbound	B/A	15.5/8.5	C/B	18.7/12.0
I-76 South of Bromley Lane	Eastbound	A/C	10.9/22.0	B/C	12.5/22.4
	Westbound	D/B	26.8/14.3	D/B	27.3/16.1
Merge/Diverge Areas					
Baseline Road Interchange	Eastbound Diverge	A/B	8.5/18.7	A/B	8.8/18.7
	Eastbound Merge	A/B	6.4/11.0	A/B	6.3/11.0
	Westbound Diverge	B/B	14.8/10.5	B/B	14.8/10.5
	Westbound Merge	B/A	15.5/8.0	B/A	15.3/8.5
Bridge Street Interchange	Eastbound Diverge	n/a	n/a	A/B	8.1/17.7
	Eastbound Merge	n/a	n/a	A/B	7.0/15.1
	Westbound Diverge	n/a	n/a	B/A	15.1/7.5
	Westbound Merge	n/a	n/a	C/B	20.7/14.2
Bromley Lane Interchange	Eastbound Diverge	A/B	5.9/18.8	A/B	7.8/19.2
	Eastbound Merge	A/B	5.9/14.7	A/B	9.7/18.4
	Westbound Diverge	B/A	18.1/9.6	C/B	21.9/13.9
	Westbound Merge	C/B	25.2/14.5	C/B	25.7/16.1

*Note: The LOS font color matches the colors used in the LOS figures

Exhibit 4-21. 2035 Action Alternatives Baseline Road Intersection LOS

Intersection	Approach	2035 No-Action (AM/PM)			2035 Action (AM/PM)		
		LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
50th Avenue	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	8.4/9.8	25/25	A/A	8.3/9.4	25/25
	Northbound ¹	C/C	18.7/20.7	50/75	C/C	18.6/21.4	50/75
West Frontage Road	Eastbound	A/B	8.3/10.7	25/25	A/B	8.2/10.2	25/25
	Westbound	A/A	8.8/7.9	25/25	A/A	8.4/7.8	25/25
	Northbound ¹	E/F**	44.0/>100	50/425	C/E	22.4/38.6	25/50
	Southbound ¹	F**/F**	>100/>100	4125/3250	F**/F**	>100/>100	2675/1550
Westbound I-76 Ramps	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	9.6/8.3	25/25	A/A	9.2/8.1	25/25
	Southbound ¹	B/C	11.8/20.7	25/75	B/C	11.0/16.0	25/50
Eastbound I-76 Ramps	Eastbound	A/A	8.6/8.1	25/25	A/A	8.5/8.0	25/25
	Westbound	A/A	**	**	A/A	**	**
	Northbound ¹	C/F**	16.4/>100	50/1250	B/F	14.3/64.4	25/500
East Frontage Road	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	7.6/8.4	25/25	A/A	7.5/8.3	0/25
	Northbound	B/B	12.3/14.5	25/25	B/B	12.0/14.1	25/25
Harvest Road	Eastbound	A/A	8.5/7.7	25/25	A/A	8.5/7.7	25/25
	Westbound	A/A	7.5/8.1	25/25	A/A	7.6/8.2	25/25
	Northbound ¹	B/B	13.0/14.5	25/25	B/B	12.8/13.9	25/25
	Southbound ¹	B/B	12.5/12.7	25/25	B/B	11.6/11.2	25/25

*Note: The LOS font color matches the colors used in the LOS figures

**HCM is limited in calculating delays and queue lengths for these locations

¹ Stop-controlled approach

Bridge Street Intersections

A summary of the results for intersections along Bridge Street are shown in Exhibit 4-22. Based on the results of the analysis:

- A reduction of vehicles traveling to Bromley Lane will result in improved operations at the 50th Avenue intersection.
- Both the northbound and southbound Prairie Falcon Parkway approaches will experience an increase in delay. Improving the connection of Bridge Street to I-76 with the proposed new interchange will draw more regional traffic to the segment of Bridge Street between 50th Avenue and I-76. This additional traffic on Bridge Street results in fewer gaps for vehicles to turn from the stop-controlled approaches onto Bridge Street. By 2035, the northbound and southbound approaches at this intersection will operate at LOS E/F in the AM and PM peak hours.

Exhibit 4-22. 2035 Action Alternatives Bridge Street Intersection LOS

Intersection	Approach	2035 No-Action (AM/PM)			2035 Action (AM/PM)		
		LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
50th Avenue ¹	Eastbound	C/E	27.5/60.6	150/425	D/D	38.7/38.3	200/300
	Westbound	C/D	32.9/39.0	175/275	D/C	53.8/23.4	250/200
	Northbound	C/F**	27.1/>100	125/775	C/E	22.5/68.2	75/175
	Southbound	B/C	19.6/28.2	100/150	C/C	21.1/26.6	75/75
	Overall	C/F**	27.3/>100	n/a	D/D	40.3/37.6	n/a
Prairie Falcon Parkway	Eastbound	A/A	8.2/8.5	25/25	A/A	8.8/9.3	25/25
	Westbound	A/A	7.8/7.8	0/25	A/A	8.0/8.1	0/25
	Northbound ²	D/D	31.3/27.7	50/25	F/E	65.3/45.1	100/50
	Southbound ²	C/C	22.3/17.7	100/50	F**/F	>100/63.9	1,175/200
West Frontage Road	Eastbound	A/A	7.7/7.9	25/25	See Bridge Street interchange detailed alternative analysis (next section of document).		
	Westbound	A/A	7.6/7.6	25/25			
	Northbound ²	B/C	14.2/16.5	25/50			
	Southbound ²	B/B	10.2/10.4	25/25			
East Frontage Road	Eastbound	A/A	7.5/7.4	25/25	See Bridge Street interchange detailed alternative analysis (next section of document).		
	Westbound	A/A	7.6/7.6	25/25			
	Northbound ²	B/B	10.3/10.9	25/25			
	Southbound ²	A/B	10.0/10.5	25/25			
Gun Club Road	Eastbound	A/A	7.5/7.4	0/0	A/A	7.6/7.4	0/0
	Westbound	A/A	7.4/7.5	25/25	A/A	7.5/7.8	0/0
	Northbound ²	A/A	9.3/9.0	25/25	A/B	9.9/10.3	25/25
	Southbound ²	A/A	9.1/9.1	25/25	A/A	9.4/9.6	25/25

*Note: The LOS font color matches the colors used in the LOS figures

**HCM is limited in calculating delays and queue lengths for these locations

¹Signalized intersection

²Stop-controlled approach

Bridge Street Interchange Detailed Alternatives Analysis

An operational analysis was completed for the different proposed Action Alternatives for the Bridge Street interchange at I-76, which includes the addition of two ramp terminals and improvements to the existing frontage road intersections. As previously described, the recommended alternatives include the addition of two, three, or four roundabouts to accommodate the vehicle movements at the frontage roads and new ramp termini.

The analysis for each alternative was performed with the ARCADY model in Junctions 8 roundabout design and capacity analysis software. Preliminary geometric parameters were used with a 10-percent capacity reduction to correlate the results to recent U.S. observations and provide conservative results. In addition to the ARCADY analysis, an HCM 2010 analysis was conducted in Junctions 8 to provide a comparison to the ARCADY results.

The results of the operational analyses for 2035 Action Alternatives at the Bridge Street interchange area are shown in Exhibit 4-23, Exhibit 4-24, and Exhibit 4-25.

- All of the roundabouts in the different Action Alternatives will operate at LOS B or better in 2035, with a majority of the approaches and overall intersections operating at LOS A.

Bromley Lane Intersections

A summary of the 2035 Action Alternatives operational analysis results for intersections along Bromley Lane are shown in Exhibit 4-26.

- 50th Avenue at the West Frontage Road will improve from LOS F/F to LOS C/B during the AM/PM peak hours, compared to the 2035 No-Build Alternative. Queues are expected to decrease from 3250 feet to 225 feet in the AM peak hour, and from 625 feet to 50 feet in the PM peak hour.
- The West Frontage Road will continue to operate poorly (LOS F/F) in the peak hours, but the magnitude of the poor operations will be reduced, compared to the 2035 No-Build Alternative. Delay is expected to reduce from over 100 sec/veh to 55.7 sec/veh in the AM peak hour, and from over 100 sec/veh to 94.1 sec/veh in the PM peak hour.
- The westbound ramp intersection will continue to operate poorly (LOS F/F) in both the AM and PM peak hours, but the magnitude of the poor operations will be reduced, compared to the 2035 No-Build Alternative. The westbound approach will improve from LOS E to LOS B in the AM peak hour, with delay reduced from 48.3 sec/veh to 14.5 sec/veh, and the expected queue is reduced from 350 feet to 75 feet. The westbound approach will improve from LOS C to LOS B in the PM peak hour, with delay reduced from 22.3 sec/veh to 12.5 sec/veh, and the expected queue is reduced from 150 feet to 50 feet. The southbound queue is expected to be 1600 feet in the AM peak hour and 1425 feet in the PM peak hour. The ramp is approximately 1500 feet long, so queues are expected to spillback onto mainline I-76 during the AM peak hour which will impact I-76 safety and operations.
- The eastbound ramp intersection will continue to operate poorly (LOS F/F) in both the AM and PM peak hours, but the magnitude of the poor operations will be reduced, compared to the 2035 No-Build Alternative. The westbound approach will improve from LOS F to LOS E in the PM peak hour, with delay reduced from 54.5 sec/veh to 44.0 sec/veh. The northbound approach will improve from LOS F to LOS C in the AM peak hour, with delay reduced from over 100 sec/veh to 22.8 sec/veh. Queuing on the ramp will spillback onto mainline I-76 which will impact I-76 safety and operations.
- Queues between the closely spaced intersections along Bromley Lane will continue to create additional operational and safety issues. Operations at the intersections west of I-76 along Bromley Lane are very similar to the 2035 No-Build Alternative.

Exhibit 4-23. 2035 Action Alternatives, Four-Roundabout Alternative LOS Results

Model	Movement	AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS*1	95% Queue Length (ft)	Delay (sec/veh)	LOS*1	95% Queue Length (ft)
West Frontage Road							
ARCADY	Overall	6.6	A	n/a	8.6	A	n/a
	Southbound	4.9	A	25	6.2	A	25
	Eastbound	6.8	A	25	10.0	B	50
	Northbound	4.6	A	25	5.1	A	25
	Westbound	6.7	A	25	7.7	A	25
HCM	Overall	8.0	A	n/a	10.1	B	n/a
	Southbound	5.4	A	25	7.3	A	25
	Eastbound	8.4	A	75	11.6	B	100
	Northbound	5.0	A	25	5.7	A	25
	Westbound	8.1	A	75	9.3	A	100
I-76 Westbound Ramps							
ARCADY	Overall	7.9	A	N/A	9.0	A	N/A
	Southbound	6.0	A	25	5.9	A	25
	Eastbound	8.7	A	25	11.0	B	50
	Westbound	7.5	A	25	7.6	A	25
HCM	Overall	9.6	A	N/A	10.5	B	N/A
	Southbound	7.4	A	25	7.1	A	25
	Eastbound	11.0	B	100	12.6	B	125
	Westbound	8.8	A	75	9.0	A	100
I-76 Eastbound Ramps							
ARCADY	Overall	6.4	A	N/A	7.8	A	N/A
	Eastbound	3.8	A	25	3.9	A	25
	Northbound	6.9	A	25	9.4	A	25
	Westbound	6.4	A	25	6.8	A	25
HCM	Overall	8.0	A	N/A	9.8	A	N/A
	Eastbound	3.8	A	25	4.4	A	25
	Northbound	8.7	A	75	11.9	B	125
	Westbound	8.3	A	50	8.8	A	50
East Frontage Road							
ARCADY	Overall	4.2	A	N/A	4.0	A	N/A
	Southbound	3.6	A	25	3.4	A	25
	Eastbound	4.0	A	25	4.0	A	25
	Northbound	3.8	A	25	3.7	A	25
	Westbound	4.6	A	25	4.2	A	25
HCM	Overall	4.7	A	N/A	4.4	A	N/A
	Southbound	3.8	A	25	3.4	A	25
	Eastbound	4.5	A	25	4.5	A	25
	Northbound	3.8	A	25	4.0	A	25
	Westbound	5.2	A	25	4.5	A	25

*Note: The LOS font color matches the colors used in the LOS figures

¹LOS Source: 2010 Highway Capacity Manual—Unsignalized Intersections

Exhibit 4-24. 2035 Action Alternatives, Three-Roundabout Alternative LOS Results

Model	Movement	AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS ^{*1}	95% Queue Length (ft)	Delay (sec/veh)	LOS ^{*1}	95% Queue Length (ft)
I-76 Westbound Ramps and West Frontage Road							
ARCADY	I-76 Off Ramp	5.8	A	25	5.9	A	25
	West Frontage Road	5.5	A	25	6.6	A	25
	Eastbound	8.4	A	25	11.9	B	75
	Northbound	5.1	A	25	5.4	A	25
	Westbound	7.6	A	25	8.1	A	25
	Overall	7.6	A	N/A	9.3	A	N/A
HCM	I-76 Off Ramp	7.5	A	25	7.4	A	25
	West Frontage Road	6.5	A	25	8.4	A	25
	Eastbound	11.3	B	100	14.7	B	150
	Northbound	6.0	A	25	6.4	A	25
	Westbound	9.0	A	75	9.7	A	100
	Overall	9.5	A	N/A	11.4	B	N/A
I-76 Eastbound Ramps							
ARCADY	Eastbound	3.6	A	25	3.9	A	25
	Northbound	6.9	A	25	9.4	A	25
	Westbound	6.4	A	25	6.8	A	25
	Overall	6.4	A	N/A	7.8	A	N/A
HCM	Eastbound	3.8	A	25	4.4	A	25
	Northbound	8.7	A	75	11.9	B	125
	Westbound	8.3	A	50	8.8	A	50
	Overall	8.0	A	N/A	9.8	A	N/A
East Frontage Road							
ARCADY	Southbound	3.6	A	25	3.4	A	25
	Eastbound	4.0	A	25	4.0	A	25
	Northbound	3.8	A	25	3.7	A	25
	Westbound	4.6	A	25	4.2	A	25
	Overall	4.2	A	N/A	4.0	A	N/A
HCM	Southbound	3.8	A	25	3.4	A	25
	Eastbound	4.5	A	25	4.5	A	25
	Northbound	3.8	A	25	4.0	A	25
	Westbound	5.2	A	25	4.5	A	25
	Overall	4.7	A	N/A	4.4	A	N/A

*Note: The LOS font color matches the colors used in the LOS figures

¹LOS Source: 2010 Highway Capacity Manual—Unsignalized Intersections

Exhibit 4-25. 2035 Action Alternatives, Two-Roundabout Alternative LOS Results

Model	Movement	AM Peak Hour			PM Peak Hour		
		Delay (sec/veh)	LOS* ¹	95% Queue Length (ft)	Delay (sec/veh)	LOS* ¹	95% Queue Length (ft)
I-76 Westbound Ramps and West Frontage Road							
ARCADY	I-76 Off Ramp	5.8	A	25	5.9	A	25
	West Frontage Road	5.5	A	25	6.6	A	25
	EB Bridge Street	8.4	A	25	11.9	B	75
	NB West Frontage Road	5.1	A	25	5.4	A	25
	WB Bridge Street	7.6	A	25	8.1	A	25
	Overall	7.6	A	N/A	9.3	A	N/A
HCM	I-76 Off Ramp	7.5	A	25	7.4	A	25
	West Frontage Road	6.5	A	25	8.4	A	25
	EB Bridge Street	11.3	B	100	14.7	B	150
	NB West Frontage Road	6.0	A	25	6.4	A	25
	WB Bridge Street	9.0	A	75	9.7	A	100
	Overall	9.5	A	N/A	11.4	B	N/A
I-76 Eastbound Ramps and East Frontage Road							
ARCADY	East Frontage Road	4.7	A	25	4.9	A	25
	EB Bridge Street	3.7	A	25	4.0	A	25
	I-76 Off Ramp	7.1	A	25	9.5	A	25
	NB East Frontage Road	4.9	A	25	5.5	A	25
	WB Bridge Street	6.3	A	25	6.3	A	25
	Overall	6.3	A	N/A	7.6	A	N/A
HCM	East Frontage Road	5.5	A	25	5.6	A	25
	EB Bridge Street	3.9	A	25	4.5	A	25
	I-76 Off Ramp	9.0	A	75	12.1	B	125
	NB East Frontage Road	5.5	A	25	7.0	A	25
	WB Bridge Street	8.2	A	50	8.0	A	25
	Overall	7.9	A	N/A	9.6	A	N/A

*Note: The LOS font color matches the colors used in the LOS figures

¹LOS Source: 2010 Highway Capacity Manual—Unsignalized Intersections

Exhibit 4-26. 2035 Action Alternatives Bromley Lane Intersection LOS

Intersection	Approach	2035 No-Action (AM/PM)			2035 Action (AM/PM)		
		LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
50th Avenue and West Frontage Road	Eastbound	A/B	8.8/12.8	50/175	A/A	7.9/9.2	25/75
	Westbound	A/A	**	**	A/A	**	**
	Southbound ¹	F**/F	>100/97.4	3250/625	C/B	19.4/11.4	225/50
Tower Road ²	Eastbound	B/B	12.5/13.9	50/50	B/B	12.2/13.7	50/50
	Westbound	B/B	12.0/13.9	50/75	B/B	11.9/13.9	50/75
	Northbound	B/B	15.2/16.1	25/50	B/B	15.2/15.9	25/50
	Southbound	B/B	13.9/13.1	0/0	B/B	13.8/13.0	0/0
	Overall	B/B	12.5/14.3	n/a	B/B	12.4/14.2	n/a
Kmart Access ²	Eastbound	A/A	7.4/8.6	25/50	B/A	11.3/7.9	50/50
	Westbound	B/C	14.0/21.0	50/125	C/C	26.2/23.6	100/150
	Southbound	B/B	12.4/18.1	0/0	B/C	15.3/20.8	25/25
	Overall	B/B	10.1/15.0	n/a	B/B	17.3/16.1	n/a
Judicial Center Drive ²	Eastbound	A/B	7.1/16.8	25/75	A/B	7.2/16.8	25/75
	Westbound	A/B	6.8/17.7	25/125	A/B	8.5/17.7	25/125
	Northbound	B/B	15.2/11.3	25/50	B/B	15.1/11.1	25/50
	Overall	A/B	7.1/16.2	n/a	A/B	7.9/16.2	n/a
Lowe's Access ²	Eastbound	B/B	13.0/18.5	50/125	B/C	12.9/28.7	50/175
	Westbound	B/B	14.0/14.8	125/100	B/B	14.0/13.7	125/150
	Northbound	B/B	12.9/16.9	25/50	B/C	13.0/22.6	25/75
	Overall	B/B	13.6/16.9	n/a	B/C	13.6/22.0	n/a
West Frontage Road ³	Eastbound	F**/F**	>100/>100	650/1450	E/F**	37.1/>100	275/1050
	Westbound	B/C	14.1/20.6	150/150	B/D	12.1/33.7	100/250
	Northbound	C/E	17.2/37.3	25/100	B/D	11.0/25.6	25/75
	Southbound	F**/F	>100/71.0	1750/450	F**/D	>100/25.1	575/175
	Overall	F**/F**	>100/>100	n/a	F/F	55.7/94.1	n/a
Westbound I-76 Ramps	Eastbound	A/A	**	**	A/A	**	**
	Westbound	E/C	48.3/22.3	350/150	B/B	14.5/12.5	75/50
	Southbound ¹	F**/F**	>100/>100	n/a	F**/F**	>100/>100	1600/1425
Eastbound I-76 Ramps	Eastbound ¹	C/F**	23.1/>100	**	C/F**	16.7/>100	n/a
	Westbound ¹	F**/F	>100/54.5	**	F**/E	>100/44.0	n/a
	Northbound ¹	F**/F**	>100/>100	**	C/F**	22.8/>100	n/a
	Overall	F**/F**	>100/>100	n/a	F**/F**	>100/>100	n/a
East Frontage Road	Eastbound	A/A	9.1/8.5	25/25	A/A	8.9/8.4	25/25
	Westbound	A/A	**	**	A/A	**	**
	Southbound ¹	C/D	19.6/27.0	25/50	C/C	17.4/22.7	25/25
Picadilly Road	Eastbound	A/A	**	**	A/A	**	**
	Westbound	A/A	8.2/8.8	25/25	A/A	8.2/8.8	25/25
	Northbound ¹	D/D	26.8/33.7	125/175	D/D	26.8/33.7	125/175

*Note: The LOS font color matches the colors used in the LOS figures

**HCM is limited in calculating delays and queue lengths for these locations

¹Stop-controlled approach

²Signalized intersection

³Roundabout

The results of the HCS analysis are meant for comparative purposes only, realizing that when the volume-capacity ratio exceeds 1, the results are not as reliable. Results of the analysis indicate that in 2035, the proposed interchange will reduce the number of elements operating at LOS E/F.

Interchange Area Delay

The results of the delay analysis are shown in Exhibit 4-27 and are compared to the results from the 2013 Existing Conditions and 2035 No-Action Alternative.

- The addition of the Bridge Street interchange will reduce overall delay in the area below the 2035 No-Action Alternative levels, and by as much as 75 percent.
- The majority of the delay will continue to occur at the Bromley Lane interchange.
- As a matter of comparison, delay encountered at the proposed Bridge Street interchange will be similar to that experienced under today’s traffic conditions at the Baseline Road interchange.

Exhibit 4-27. 2035 Action Alternatives Interchange Area Delay

Alternative	Interchange	Total Delay (vehicle-hours/day)					
		AM			PM		
2013 Existing	Baseline Road	6.4			11.5		
	Bridge Street	1.4			1.9		
	Bromley Lane	20.2			39.8		
	Total	28.0			53.2		
2035 No-Action	Baseline Road	442.3			486.2		
	Bridge Street	1.8			3.7		
	Bromley Lane	666.1			996.3		
	Total	1,110.2			1,486.2		
2035 Action	Baseline Road	180.7			98.0		
	Bridge Street	7.4 ¹	4.8 ²	5.3 ³	10.1 ¹	6.8 ²	7.2 ³
	Bromley Lane	262.7			263.3		
	Total	450.9¹	448.3²	448.8³	371.4¹	368.1²	368.5³

¹Four-roundabout alternative
²Three-roundabout alternative
³Two-roundabout alternative

Travel Times

The addition of the Bridge Street interchange provides motorists with a choice of routes to complete their trip. Motorists who are currently traveling between the Bromley Lane interchange and the intersection of 50th Avenue and Bridge Street can use Route 1 or Route 2 (see Exhibit 4-28). With the proposed interchange, motorists can continue to use these routes or they can instead use Route 3 or Route 4 to reach the same destinations. The new routes are approximately twice as long as the original routes, but half of the distance is on I-76, which will allow traffic to travel at highway speeds.

Exhibit 4-28. 2035 Action Alternative Travel Time Routes



The results of the 2035 Action Alternatives travel time analysis are shown in Exhibit 4-29.

Exhibit 4-29. 2035 Action Alternatives Travel Times

Alternative	Travel Time (seconds per vehicle)*							
	Route 1**		Route 2**		Route 3**		Route 4**	
	AM	PM	AM	PM	AM	PM	AM	PM
2013 Existing	224	190	214	207	n/a	n/a	n/a	n/a
2035 No-Action	376	377	412	423	n/a	n/a	n/a	n/a
2035 Action	301	220	245	369	211	218	233	220

*Note: Travel times were calculated for the four-roundabout alternative, which was determined to reflect the worst-case scenario.

**Refer to Exhibit 4-28 for a description of the routes.

- The travel times for Routes 1 and 2 are reduced compared to the No-Action Alternative, but they are still longer than 2013 travel times
- Routes 3 and 4 travel times are lower than the 2035 No-Action Alternative times for Routes 1 and 2 and are similar to 2013 travel times
- Routes 3 and 4 travel times are similar to Routes 1 and 2 travel times for the Existing Conditions
- Motorists have more route choices that will all save time, as much as three minutes, compared to the No-Action Alternative

Other Improvements

The addition of the interchange at Bridge Street does not result in all transportation elements operating at LOS D or better. Adding an interchange at I-76 will result in rerouting traffic to the transportation network elements on and around Bridge Street. As a result, the northbound and southbound approaches to the intersection of Prairie Falcon Parkway will operate at LOS E/F during the peaks. Since the addition of the interchange resulted in this degradation in operations, the proposed project will need to improve this intersection to operate at LOS D or better.

A traffic signal at this location will be an acceptable improvement measure because the spacing of intersections along Bridge Street will better accommodate a traffic signal. This is the only other improvement measure that will be related to the proposed interchange. A signal must also meet a signal warrant, as per MUTCD Chapter 4C. This analysis is a first step to help reduce any delays. The results of the improvement analysis are shown in Exhibit 4-30.

Exhibit 4-30. 2035 Action Alternatives, Other Improvements

Intersection/ Approach	Before Mitigation (AM/PM)			After Mitigation (AM/PM)		
	LOS*	Delay (sec/veh)	95% Queue Length (ft)	LOS*	Delay (sec/veh)	95% Queue Length (ft)
Bridge Street and Prairie Falcon Parkway						
Eastbound	A/A	8.8/9.3	25/25	C ² /C ²	31.5/32.6	125/175
Westbound	A/A	8.0/8.1	0/25	D ² /C ²	36.1/30.1	225/200
Northbound ¹	F/E	65.3/45.1	100/50	D ² /D ²	39.3/37.7	50/25
Southbound ¹	F ^{**} /F	>100/63.9	1,175/200	C ² /C ²	32.4/27.4	150/75
Overall	n/a	n/a	n/a	C ² /C ²	33.8/30.9	n/a

*Note: The LOS font color matches the colors used in the LOS figures

**HCM is limited in calculating delays and queue lengths for these locations

¹Stop-controlled approach

²Signalized intersection

Summary

The 2035 Action Alternatives will:

- Improve overall connectivity to/from I-76 and Brighton
- Reduce the number of transportation network elements operating at LOS E/F
- Reduce overall delay and queues at key intersections
- Save motorists as much as three minutes in travel time per vehicle while completing trips to destinations along Bridge Street and to the west of 50th Avenue
- Require the addition of a traffic signal or other mitigation to the Bridge Street and Prairie Falcon Parkway intersection
- Extend the life of the infrastructure at Bromley Lane to at least the year 2030, which is about five years longer than the No-Action Alternative

Pedestrian and bicycle operations and safety will be affected by growing congestion as traffic volumes increase along the existing streets, a negative direct impact of the No-Action Alternative. Additionally, negative indirect impacts to pedestrian and bicycle operations and safety will occur outside the study area from diverted traffic and the resulting increased congestion.

4.4 Impacts to System Connectivity

Connectivity in the study area will improve with the addition of a new access point at I-76 and Bridge Street. This access point will increase redundancy in the system and benefit mobility for regional trips, local trips, and emergency vehicles. Trips with origins or destinations along Bridge Street will have direct access to the interstate system and will no longer need to utilize frontage roads and additional surface streets to make regional connections. This will decrease travel times (shorter trip lengths with less out-of-direction travel) and traffic volumes at those interchanges and on the surface streets between the interchanges.

4.5 Impacts to Transit Service

No transit routes currently extend over the Bridge Street overpass. The addition of a new access point at I-76 and Bridge Street may provide an opportunity for the Regional Transportation District (RTD) to adjust bus routes, schedules, and stops to provide more efficient service to the eastern Brighton area. Buses traveling in traffic will be impacted by changing travel patterns, though no direct or negative impacts are anticipated along Bridge Street, 50th Street, or Bromley Lane west of the proposed interchange.

4.6 Impacts to Pedestrian and Bicycle Facilities

The City of Brighton requires new developments to construct sidewalks on lots located adjacent to a major or minor arterial, a collector, or adjacent to a primary transportation route to a public or private school within the city limits. The proposed interchange at I-76 and Bridge Street will not preclude or disrupt any existing or future investments in pedestrian and bicycle facilities in eastern Brighton.

According to CDOT's bicycle policy directive and Roadway Design Guide, bicycles are permitted on Bridge Street and the surrounding street network, with the exception of on I-76. The policy's directive is to provide transportation infrastructure that accommodates bicycle and pedestrian use of the highways in a manner that is safe and reliable for all highway users. The needs of bicyclists and pedestrians will be included in the planning, design, and operation of transportation facilities, as a matter of routine.

Under the Preferred Alternative, small direct positive impacts will occur from widened sidewalks and improved traffic operations. Positive indirect impacts will potentially occur from individuals using pedestrian and bicycle facilities to avoid the traffic congestion.

4.7 Impacts to Truck and Rail Freight Facilities

The proposed interchange at I-76 and Bridge Street will not impact the truck routes designated by the City of Brighton. The Preferred Alternative is designed to accommodate trucks so that Bridge Street will continue to serve truck freight both locally and regionally. The additional access point to the interstate will benefit trucks and emergency response vehicles by providing more direct routes to destinations and the interstate. Overall truck percentages are expected to remain consistent within the study area. However, truck percentages along the frontage roads are expected to decrease as a more direct regional connection is available.

4.8 Impacts to Safety

Safety is a critical consideration in determining the Preferred Alternative for the proposed interchange. No direct impacts to safety along I-76 or surrounding surface roads are anticipated with the addition of a new access point. In fact, the additional access point will benefit emergency response vehicles. Additionally, the roundabouts are designed to improve safety and mobility in east Brighton. The interchange and all conflict points will have adequate lighting; details on the exact locations and type of lighting will be decided in final design. The Preferred Alternative meets driver expectations, limits conflict and decision points through the roundabouts, and provides a clear, direct route between I-76 and Bridge Street.

5. Mitigation

Mitigation measures are not required since there are no adverse effects to transportation as a part of this project. When construction begins, temporary construction impacts may occur, which will be mitigated with traffic control and detours.

Appendices

Appendix A: Traffic Operations Methodology Memorandum

Appendix B: Methodology for Developing Future Projected Traffic Volumes

Appendix C: Vehicle Classification Data

Appendix D: Safety Assessment

Appendix E: HCS Reports

I-76 & Bridge Street INTERCHANGE

Technical Memorandum

To: Joe Smith, City of Brighton; Markos Atamo, CDOT; Steve Hersey, CDOT; Monica Pavlik, FHWA

From: Dave Sprague

CC: Ken DePinto, Jeff Kullman, Tory McKennan

Date: August 2013

Subject: Traffic Operations Methodology

1.0 INTRODUCTION

Atkins has been asked to study the possibility of constructing a new interchange along I-76 at Bridge Street (old State Highway 7) within the City of Brighton. The steps required for the interchange approval from the Colorado Department of Transportation (CDOT), Denver Regional Council of Governments (DRCOG), and the Federal Highway Administration (FHWA) include completion of:

- System Level Study (SLS)
- Environmental Assessment (EA)
- Interchange Access Request (IAR)

This memorandum describes the methodologies used to complete the traffic operations analysis for the Bridge Street System Level Study (SLS), including the traffic operations modeling tools and the measures of effectiveness that will be reported. The methodologies outlined in this document will be applied for the completion of the EA and the IAR. If changes are required to complete the remaining steps, an updated methodology memorandum will be produced to document the reasons for a change and describe changes to tools, measure of effectiveness, and/or overall procedures necessary to complete the interchange approval process.

2.0 TRAFFIC OPERATIONS MODEL DEVELOPMENT

There are several traffic operations analyses that will be completed for the Bridge Street SLS. This section discusses the questions that need to be answered, the time periods that will be evaluated, the alternatives that will be modeled, and the tools that will be used to complete the various analyses.

The traffic operations analysis for the study area, which is the I-76 corridor between Bromley Lane and Baseline Avenue, will include:

- Confirmation that all elements of the proposed alternative will have satisfactory operations during the peak periods including:
 - All ramp merge and diverge areas, weave sections, and basic freeway segments
 - All ramp junction intersections with surface streets
 - Major intersections (controlled by traffic signals/roundabouts, or the intersection of two collector/arterials) along surface streets within ½ mile of the existing and planned interchanges

This analysis will be used to assist in the selection of a preferred alternative while meeting the requirements of the CDOT, National Environmental Policy Act (NEPA), and the FHWA.

2.1 Required Analysis

In order to answer the questions necessary to complete the interchange approval process, the following scenarios will be modeled for both the AM and PM peak hours:

- Existing Conditions 2013
- 2019 No Action (Opening Year)
- 2019 Build (Opening Year)
- 2035 No Action (Horizon Year)
- 2035 Build (Horizon Year)

The Build conditions may include multiple design alternatives to be identified through the public involvement process and the project screening/evaluation phase.

2.2 Reporting Approach

Results of the traffic operations analysis will be reported in the SLS as well as in the transportation chapter of the EA and as support of the IAR process. The reports will include discussion regarding model development, calibration, results of the various analyses completed, and the comparison between the No-Action Alternative and different build alternatives. Recommended mitigation necessary to alleviate impacts caused by the project will also be discussed.

For the EA, the following questions need to be answered to address NEPA requirements:

1. Does the alternative work?
2. What is the experience of a highway user? (Examples include; How much delay will I experience on I-76? How do I get on and off the freeway?)
3. What is the experience of a neighborhood resident or business?(Examples include; How much traffic will there be on S. 50th Street? How will customers get to my business?)

For the SLS and Final EA, the questions above will be verified for any alternative changes. For the IAR, the following policy points will need to be addressed by the traffic analysis:

Policy Point 1 *"The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design year traffic demands while at the same time providing the access intended by the proposal."*

Policy Point 2 *"All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified."*

Policy Point 3 *"An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network. Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative."*

3.0 RECOMMENDED MODELING TOOLS

The following tools are recommended for the traffic operations analysis for the Bridge Street Interchange project:

- DRCOG Regional Travel Demand Model (TDM)
- National Cooperative Highway Research Program Report (NCHRP)-255, 572, and 672
- Highway Capacity Manual (HCM) utilizing Highway Capacity Software (HCS 6.41)

The DRCOG Regional TDM uses various employment, population, and other factors to forecast traffic patterns on the future roadway network and ridership on the transit networks. This model is used to generate projected traffic volumes along with origin-destination data. NCHRP 255 includes standard procedures to translate travel model assignments, land use information, and historical data into information to support project development decisions.

HCS implements the procedures defined in the Highway Capacity Manual (HCM) to automate the process of using equations and tables. The software is used to report on traffic conditions based on user inputs. CDOT and Atkins will provide opportunities for the FHWA and City of Brighton staff to review validation material, and respond to comments and questions.

3.1 DRCOG Compass Travel Demand Model

The Compass travel demand model of the Denver Regional Council of Governments (DRCOG) will be refined and applied to produce forecasted daily traffic volumes and peak hour turning movements for the year 2035. The analysis includes the following steps:

- Assemble, collect, and analyze existing traffic data;
- Obtain and refine the DRCOG regional travel demand model, including review of socioeconomic and network assumptions;
- Refine and run the base year 2010 model;
- Prepare and run 2035 models with Build and No-Build assumptions;
- Adjust daily traffic volume forecasts from the model using techniques described in Report No. 255 of the National Cooperative Highway Research Program (NCHRP 255); and
- Utilize the traffic forecasts to estimate future peak hour turning movements at key intersections.

The regional 2010 and 2035 Compass travel models will be obtained from DRCOG and refined for the traffic forecast analysis. The region's most current socioeconomic data will be obtained from DRCOG. Based on the City of Brighton's recommendations, adjustments will be made to the 2035 socioeconomic forecasts. Anticipated adjustments include redistributing forecasted activity in and around the study area. The 2010 and 2035 Compass model roadway networks will be refined with additional local detail in and around the interchange study area. A full description of the adjustments, clean up, and calibration of the models will be included as part of the SLS documentation process.

The base year used to develop traffic forecasts is 2013, consistent with the study time frame and the data collection effort. The 2010 traffic counts in the DRCOG model and the 2013 turning movement counts were recorded in a spreadsheet and compared. The 2010 counts and volumes in the model were adjusted by 1.2 percent per year to simulate 2013 conditions. Network changes between 2010 and 2013, although minimal in the project study area, were considered in the comparison. The continuum of counts and model volumes along a corridor and local access points were also considered in establishing the 2013 counts. From this exercise, a 2013 final count was recorded for each roadway segment in the study area. These 2013 final counts were used as the basis for adjusting the 2035 model volumes to account for differences between counts and volumes in the base year model.

3.2 NCHRP-255 Methodology

The NCHRP-255 methodology is a post processing technique used to calibrate the 2035 forecasted volumes. The process compares the calibrated travel demand model output with actual traffic counts. The NCHRP 255 process adjusts the 2035 traffic volume forecasts from the regional model to account for differences between model

estimates and observed traffic counts in the 2013 base year. Future turning movements counts are then developed based on existing 2013 observed data, future projected link volumes, and the procedures outlined in the NCHRP 255 report.

3.3 HCS

Based on discussion with CDOT and FHWA, an agreement was reached that micro-simulation of the roadway was not necessary as long as existing and projected traffic volumes on I-76, I-76 ramps, and Bridge Street in the area of the proposed interchange were not above capacity for the existing or planned facilities. Based on the adjusted 2035 traffic volumes from the DRCOG model, Atkins was able to evaluate the daily and peak hour volumes on the facilities to determine if any roadways would exceed capacity. The following table shows the results of the capacity analysis.

Table 1: Results of Capacity Analysis for Bridge Street Interchange Project

Facility	Capacity (vehicles per hour)*	2035 No-Build Projected Volumes (AM/PM peak hour)	2035 Build Projected Volumes (AM/PM peak hour)
I-76 south of Bromley Lane	4,000 (each direction)	Northbound: 1,350/2,700 Southbound: 3,000/1,600	Northbound: 1,600/2,800 Southbound: 3,100/1,800
I-76 between Bromley Lane and Bridge Street	4,000 (each direction)	Northbound: 900/1,900 Southbound: 2,000/1,100	Northbound: 1,300/2,400 Southbound: 2,400/1,500
I-76 between Bridge Street and Baseline Road	4,000 (each direction)	Northbound: 900/1,900 Southbound: 2,000/1,100	Northbound: 1,000/1,900 Southbound: 2,000/1,200
I-76 north of Baseline Road	4,000 (each direction)	Northbound: 900/1,500 Southbound: 1,600/1,100	Northbound: 900/1,500 Southbound: 1,600/1,100
Bridge Street west of I-76	700 (each direction)	Eastbound: 250/260 Westbound: 200/350	Eastbound: 450/500 Westbound: 450/550
Bridge Street over I-76	700 (each direction)	Eastbound: 100/150 Westbound: 150/150	Eastbound: 100/200 Westbound: 550/600
Bridge Street east of I-76	700 (each direction)	Eastbound: 50/100 Westbound: 100/50	Eastbound: 100/200 Westbound: 200/100
I-76 SB off ramp at Baseline Road	1,500	150/200	100/100
I-76 SB on ramp at Baseline Road	1,500	550/200	450/150
I-76 NB off ramp at Baseline Road	1,500	150/550	100/500

I-76 NB on ramp at Baseline Road	1,500	150/150	100/100
I-76 SB off ramp at Bridge Street	1,500	N/A	150/100
I-76 SB on ramp at Bridge Street	1,500	N/A	550/450
I-76 NB off ramp at Bridge Street	1,500	N/A	500/550
I-76 NB on ramp at Bridge Street	1,500	N/A	100/100
I-76 SB off ramp at Bromley Lane	1,500	150/150	150/150
I-76 SB on ramp at Bromley Lane	1,500	1200/700	850/500
I-76 NB off ramp at Bromley Lane	1,500	500/1000	300/600
I-76 NB on ramp at Bromley Lane	1,500	60/150	100/150

* Based on the latest Highway Capacity Manual: I-76 is a 4-lane freeway with a calculated capacity of 2,000 vehicles per lane per hour based on prevailing existing conditions within the study area as collected in 2013. Bridge Street is a 2-lane arterial with an assumed capacity of 700 vehicles per hour per lane. All single lane ramps have a calculated capacity of 1,500 vehicles per hour.

Based on the projected volumes in the area and the defined capacities from the latest version of the Highway Capacity Manual, all of the critical links in the area are projected to operate well below capacity for the 2035 conditions. Thus, HCS is the recommended tool to analyze traffic operations for the projected traffic conditions. For HCS, the Level of Service will be reported for the Existing, No-Action, and Build Alternatives at the following locations:

- All merge and diverge areas on I-76
- Mainline segments of I-76
- Existing and future ramp junction intersections
- Existing and future major intersections within ½ mile of the existing and planned interchanges

Boundaries for the HCM analysis are shown in Figure 1 below:

Figure 1: Study Area



The data collection attachment identifies all critical intersections that will be analyzed.

4.0 ROUNDABOUT ANALYSIS

If necessary, an alternative including roundabouts will be designed using two separate capacity models, HCM procedures and Assessment of Roundabout Capacity and Delay (ARCADY) software. The HCM 2010 capacity equations, which are dependent on critical and follow-up headways, are based on national averages; however, lower headways are observed than the HCM 2010 defaults. Critical headway and follow-up headway values will be adjusted in the HCM analysis to better reflect observations at U.S. roundabouts. Headway values used in the analysis are listed in Table 2. These headways are expected to decrease as driver familiarity increases over time.

Table 2: Adjusted Headway Values

# of Circulating (Conflicting) Lanes	Critical Headway (s)	Follow-up Headway (s)
One	4.2	2.8
Two	4.0	2.8

Therefore, an empirical, regression-based deterministic model, ARCADY, is proposed for the roundabout operational analysis with calibration for U.S. conditions. ARCADY software, intrinsically links roundabout geometry to driver behavior and in turn to predicted capacities, queues and delays. ARCADY has been successfully used to design or improve thousands of roundabouts throughout the world.

Operational results are based on the Highway Capacity Manual (HCM) method. Due to the complex nature of the proposed roundabouts on this project the normal HCM method of roundabout capacity analysis may not accurately predict operating conditions for the design year traffic volumes. The FHWA publication *Roundabouts: An Informational Guide, Second Edition* suggests three basic types of analysis for roundabout design: HCM method, deterministic software, or simulation. Results of the HCM method will be supplemented with ARCADY (deterministic), a more sophisticated analysis for this project. The following considerations are the basis for supplementing the HCM analysis with an empirical model:

The current Highway Capacity Manual roundabout procedure is a low definition model, basing capacity on gap parameters alone, not accounting for variation in geometry, environment or driver behavior. In addition, it does not account for the dynamic aspects of roundabout operation, whereby the capacity of an entry is a function of the capacity and flow of an upstream entry iteratively beyond a 15 minute time slice. While the database on which these procedures are based is the most comprehensive yet developed for U.S. conditions, it has limitations. It covers typical roundabout facilities quite well, but lacks examples of situations where:

- priority reversal occurs, such as unusual forced entry conditions under high flows;
- a high level of pedestrian or bicycle activity is present;
- the roundabout is in close proximity to one or more other roundabouts;
- a two-lane right-turn bypass is proposed;
- more than four legs and more than two entry lanes are present;
- the effectiveness of the geometry, e.g. natural paths into the roundabout; and/or
- lane utilization and balance depending on downstream destinations.

Additionally, ARCADY software can report results based on the HCM method. Since we are considering roundabouts with more than 4 legs, a tool other than HCS software must be used. HCS software can only model roundabouts with 4 legs.

ARCADY software contains a calibration function which allows for adjusting the modeling to reflect local conditions. ARCADY software also provides the following capabilities not present in the current HCM method of analysis:

- Iterative analysis over multiple time periods
- Geometric sensitivity
- Peak hour traffic flow profile
- Residual capacity analysis
- Bypass lane analysis (including 2 lanes)
- Pedestrian crossing analysis
- Linked roundabouts
- Graphical output

5.0 SUMMARY

Level of service is the primary measure to determine the efficiency of alternatives considered for the I-76 and Bridge Street Interchange. Based on V/C results which display unsaturated conditions, HCS is the appropriate analysis tool. Roundabout alternatives will be analyzed with ARCADY software, and results will be reported for both the HCM method and the ARCADY method.

ATTACHMENT

DATA COLLECTION PROCESS

The following traffic data was collected and will be used in the traffic operations model development and calibration process:

- Average daily traffic (ADT) volumes
- Peak hour turning movement counts (TMC)
- Average Speeds
- Truck Percentages

Average Daily Traffic Volumes

The ADT counts will provide a baseline for evaluating existing 2013 conditions and calibrating the output of the 2013 base year models. The ADT data was collected over a 24-hour weekday period, to represent typical traffic volumes and avoid possible atypical traffic patterns that may occur on the weekends. The ADT data includes the collection of vehicle counts, classification data, and average speed data in 1-hour intervals. ADT counts were collected on a mix of surface streets and highway segments and on the ramps along I-76 at the following locations:

- I-76 SB Off Ramp at Baseline Road
- I-76 SB On Ramp at Baseline Road
- I-76 SB Off Ramp at Baseline Road
- I-76 SB On Ramp at Baseline Road
- I-76 SB Off Ramp at Bromley Road
- I-76 SB On Ramp at Bromley Road
- I-76 SB Off Ramp at Bromley Road
- I-76 SB On Ramp at Bromley Road
- I-76 SB/NB mainline at a location north of Baseline Road

Peak Hour Turning Movement Counts (TMCs)

Peak hour TMCs were collected at key intersections within the area surrounding the Bridge Street corridor. The main purpose of the TMCs is to help evaluate the operations of intersections under 2013 conditions, as well as to derive, future year turning volumes from projected link volumes. The TMC data was collected between the hours of 7:00 and 8:00 a.m. and 5:00 and 6:00 p.m. on a Wednesday to represent typical traffic volumes and avoid possible atypical traffic patterns that may occur on Monday, Friday, or the weekends. The TMC data includes the collection of vehicle counts in 15-minute intervals by placing an individual at the intersection and using an electronic count board to count vehicle demands. TMC data was collected at the following locations:

- Tower Road and Bromley Lane
- Kmart distribution center and Bromley Lane
- Judicial Center Drive and Bromley Lane
- Lowes driveway and Bromley Lane
- West Frontage Road and Bromley Lane
- I-76 SB Ramps and Bromley Lane
- I-76 NB Ramps and Bromely Lane
- East Frontage Road and Bromley Lane
- Picadilly Road and Bromley Lane

- 50th Street and West Frontage Road
- 50th Street and 160th Ave
- Prairie Falcon Parkway and 160th Ave
- West Frontage Road and 160th Ave
- East Frontage Road and 160th Ave
- East Frontage Road and Bromley Business Parkway
- Gun Club Road and 160th Ave
- Harvest Road and Baseline Road
- East Frontage Road and Baseline Road
- I-76 NB Ramps and Baseline Road
- I-76 SB Ramps and Baseline Road
- West Frontage Road and Baseline Road
- 50th Street and Baseline Road

Vehicle Classification and Speed Data

Vehicle classification and speed data was collected along portions of major arterials and highways within the area surrounding the Bridge Street corridor. The main purpose of speed data will be to provide details regarding existing operations to assist in the calibration of the various traffic operation models for the existing 2013 baseline conditions. The data was collected between the hours over a 24-hour weekday period Wednesday to avoid possible atypical traffic patterns that may occur on the weekends. The data was collected at the following locations:

- Baseline Road – West of Homestead Ave
- Baseline Road – West of Harvest Road
- Bridge Street – West of West Frontage Road
- Bridge Street – East of West Frontage Road
- Bridge Street – East of East Frontage Road
- Bridge Street – West of East Frontage Road
- Bromley Lane – West of West Frontage Road
- Bromley Lane – West of Picadilly Road
- West Frontage Road – South of Baseline Road
- West Frontage Road – South of Longspur Drive
- East Frontage Road – South of Baseline Road
- East Frontage Road- South of Bromley Business Parkway



Appendix B

Methodology for Developing Future Projected Traffic Volumes

Appendix B
I-76 at Bridge Street Interchange
Traffic Forecasts
City of Brighton

ATKINS



I-76 at Bridge Street Interchange Study

Technical Report – Traffic Forecasts

As part of the services provided for the proposed new interchange at I-76 and Bridge Street in Brighton, Colorado, traffic volume forecasts were prepared to support the sizing of roadway facilities and the operational analysis to identify signal and intersection specifications. This report documents the process through which the Compass travel demand model of the Denver Regional Council of Governments (DRCOG) was refined and applied to produce forecasted daily traffic volumes and peak hour turning movements for the year 2035.

The following steps were undertaken in this analysis:

- Assemble, collect, and analyze existing traffic data
- Obtain and refine the DRCOG regional travel demand model, including review of socioeconomic and network assumptions
- Refine and run the base year 2010 model
- Prepare and run 2035 models with Build and No-Build assumptions
- Adjust daily traffic volume forecasts from the model using techniques described in Report No. 255 of the National Cooperative Highway Research Program (NCHRP 255)
- Utilize the traffic forecasts to estimate future peak hour turning movements at key intersections

1.0 TRAFFIC DATA COLLECTION AND ANALYSIS

Daily traffic counts were collected by All Traffic Data to support the traffic analysis for the interchange and surrounding roads in the study area. In addition, the DRCOG Compass model's 2010 roadway network included traffic counts on some roads in the study area. These traffic counts were used to establish the 2013 base year traffic volumes and to adjust the 2035 traffic volumes from the model using NCHRP 255 techniques.

2.0 TRAVEL MODEL REFINEMENT AND APPLICATION

The regional 2010 and 2035 Compass travel models were obtained from DRCOG and refined for the traffic forecast analysis. Compass is the model provided to local governments and consultants for project-level analyses. It is based on TransCAD software and uses DRCOG's most recent planning assumptions.

2.1 TRAFFIC ANALYSIS ZONES AND SOCIOECONOMIC DATA

Traffic analysis zones (TAZs) within the interchange study area were reviewed by the City of Brighton for appropriate size and shape when considering local traffic and development patterns. TAZs are small areas in which aggregations of socioeconomic data (e.g., population, households, employment) are contained. This is what is meant by aggregate modeling – jobs and households are not modeled individually. Rather, they are aggregated into TAZs and treated as a group. This greatly reduces the detail in the model so that every household, job, and driveway access does not need to be defined and maintained.

Again, the TAZs contain the socioeconomic data, also referred to as the activity that generates trips and travel. The socioeconomic data is converted to trips, which are loaded onto the roadway network using centroid connectors that connect the center of each TAZ to the network. The centroid connectors represent roads interior to each TAZ so that it is not necessary to model all of the local streets and driveway/access points to the network. When reviewing TAZs for a subarea study such as this, the number and location of these access points are important considerations. Typically, TAZs are defined along roadways, natural features (e.g., rivers), railroads, and other delineations. They tend to be smaller the closer they are to the area of interest (i.e., near the interchange).

Based on the City's recommendations, several adjustments were made to the 2035 socioeconomic forecasts but the TAZ structure was not changed as the model's existing TAZ boundary assumptions were sufficient to accommodate the future growth and resulting traffic patterns in the local area. Overall, the total number of activity units (e.g., households, employment) did not change from the model's control totals although some of the activity forecasted for 2035 was re-distributed in and around the study area. Exhibit 1 shows the TAZ layer in the local area of the proposed interchange, and Exhibit 2 summarizes socioeconomic data in the study area. The full set of socioeconomic data assumptions are contained in Appendix H-1.

Exhibit 1 – Traffic Analysis Zones

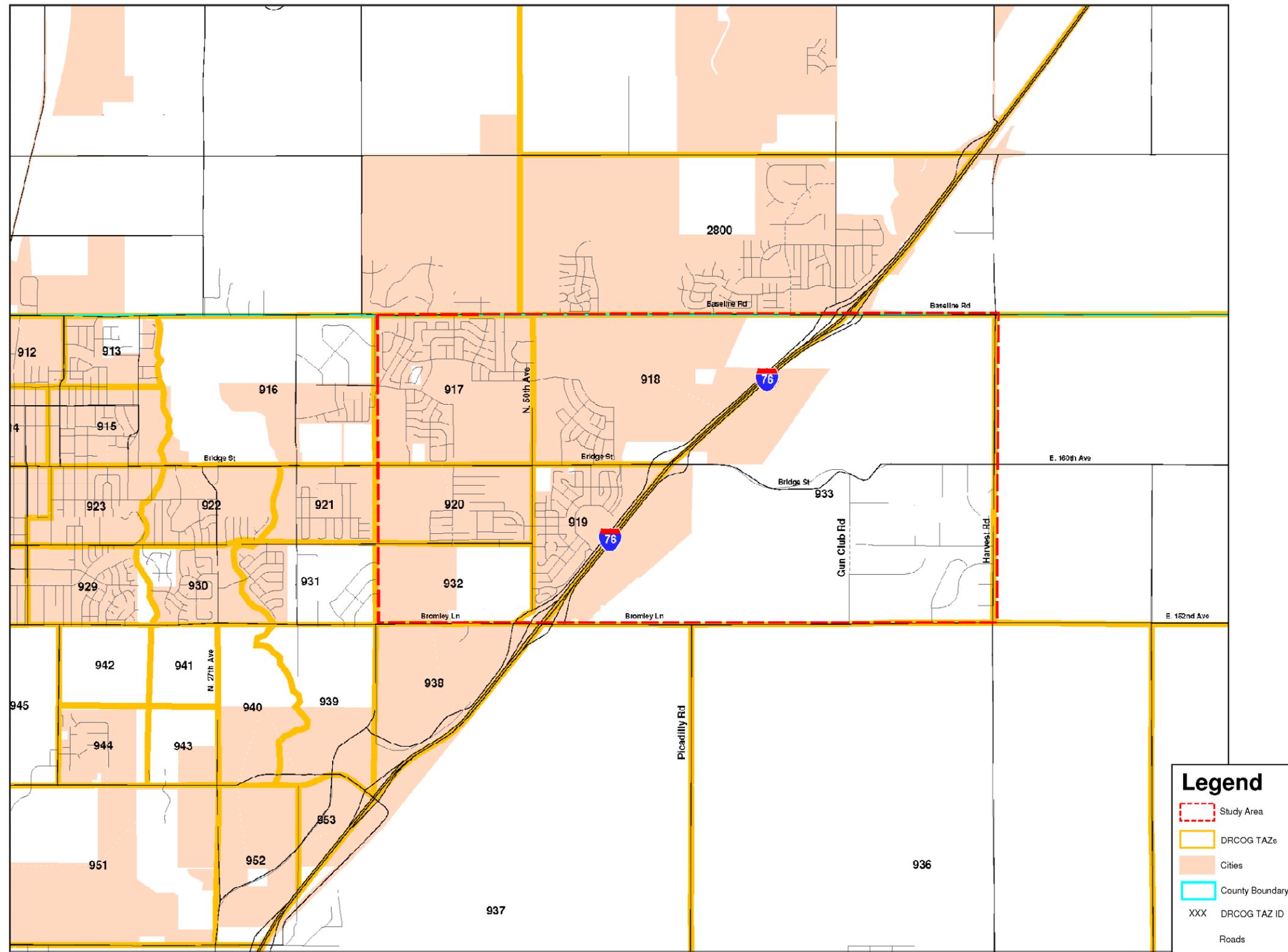


Exhibit 2 – Socioeconomic Data Summary

Study Area				
Activity Unit	2010	2035	Difference	Growth Rate (%/yr., compd.)
Households	1,496	5,177	3,681	5.1%
Basic Employment	174	244	70	1.4%
Retail Employment	23	40	17	2.2%
Service Employment	389	480	91	0.8%
Total Employment	586	764	178	1.1%

2.2 ROADWAY NETWORK ADJUSTMENTS

The 2010 and 2035 Compass model roadway networks were refined with additional local detail in and around the interchange study area. Exhibits 3, 4, and 5 show the final 2010, 2035 No-Build, and 2035 Build networks, respectively.

Exhibit 3 – 2010 Roadway Network

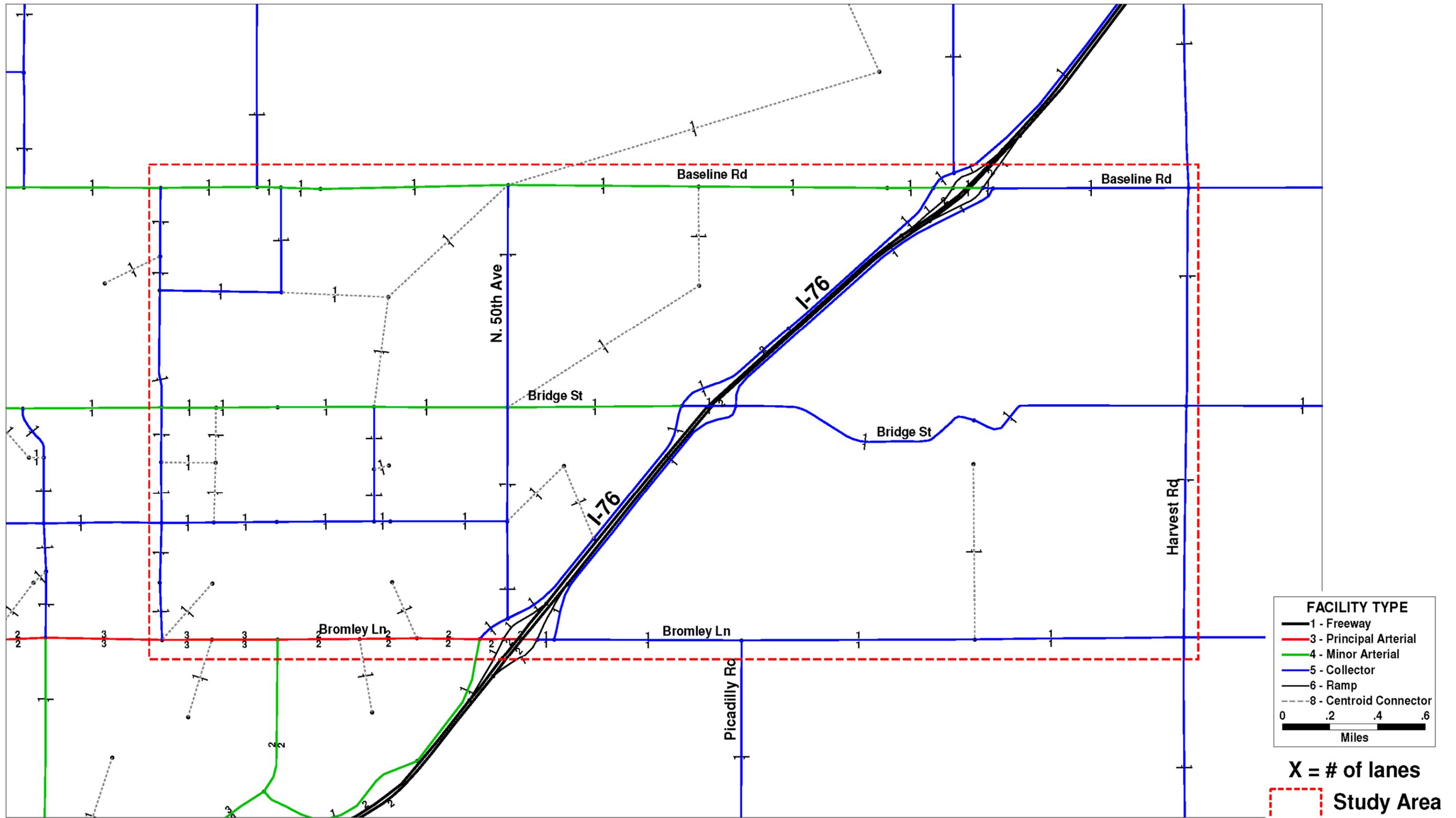


Exhibit 4 – 2035 No-Build Roadway Network

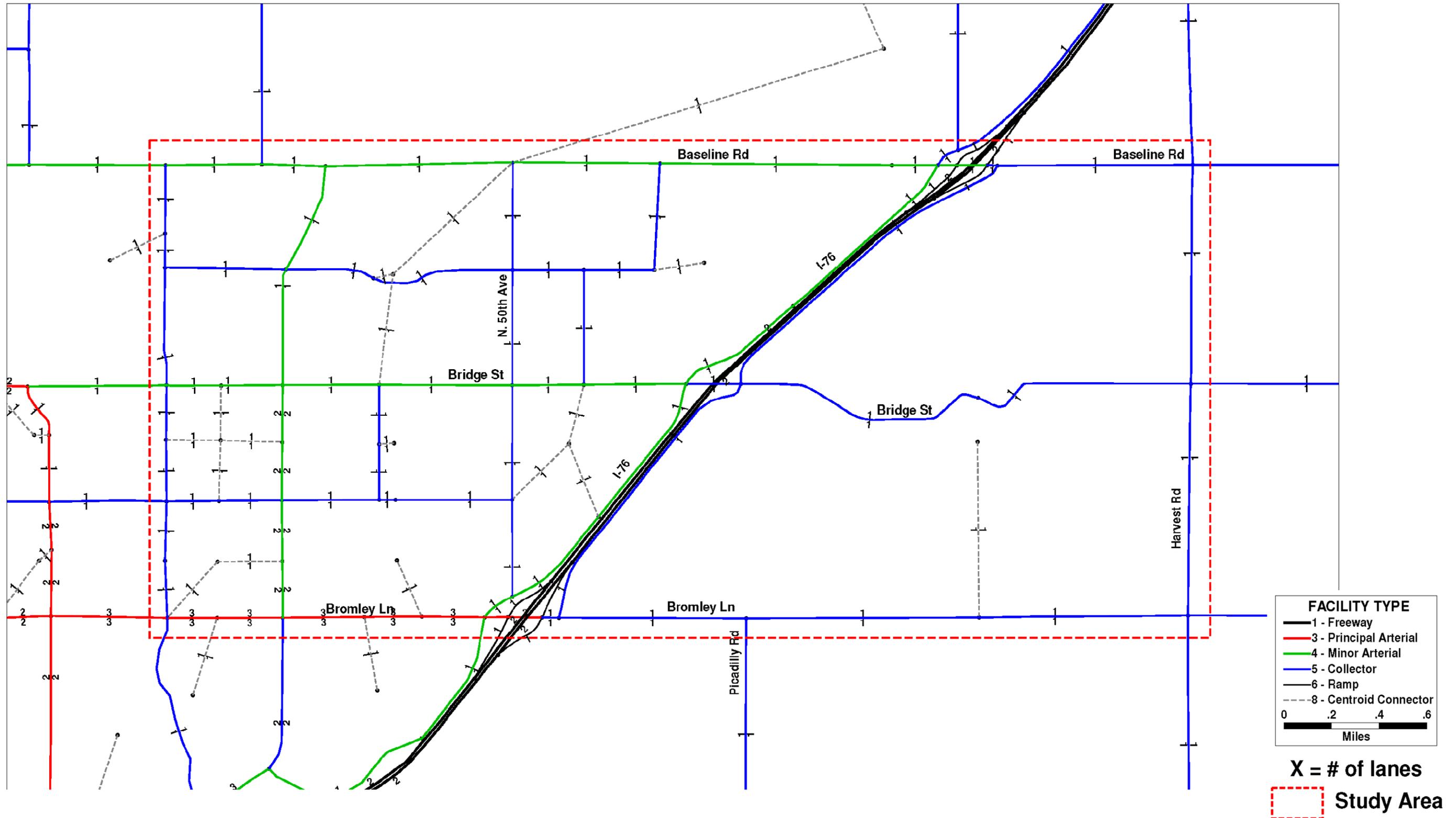
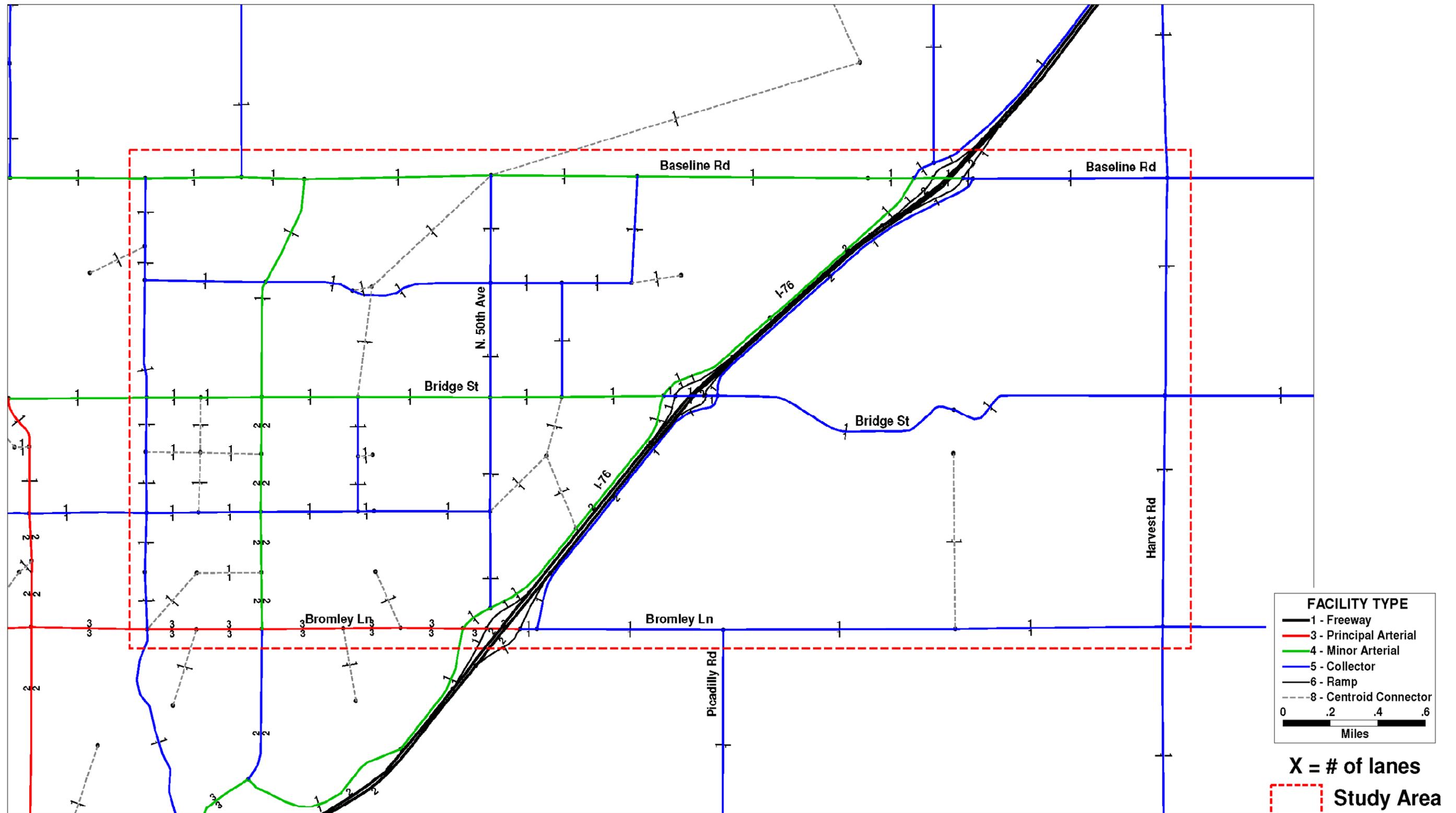


Exhibit 5 – 2035 Build Roadway Network



2.3 TRAFFIC FORECASTING AND ANALYSIS

After refinement of the travel model to provide more detail within the study area, the model was run for the 2010 base year. Model results were then compared to observed traffic counts. Some centroid connector adjustments were made to better simulate local traffic patterns, and the 2010 model was run a final time. Again, the centroid connectors represent roads within the interior of each TAZ so that all of the individual local/residential streets and driveway/access points to the network do not need to be modeled. The location at which they connect to the network influences the forecasts of local traffic patterns.

The model was then updated for the future horizon year of 2035 and run for the No-build and Build scenarios. Once the traffic forecasts from these model runs were completed, the results were processed using NCHRP 255 techniques. The NCHRP 255 process adjusts the 2035 traffic volume forecasts from the regional model to account for differences between model estimates and observed traffic counts in the 2010 base year. The process uses ratio, difference, or a combination of both functions to adjust the traffic forecasts. In some cases, traffic forecasts were smoothed by hand to account for conflicting traffic count data for example.

The 2010 and 2035 traffic volumes from the DRCOG Compass model are shown in Exhibits 6, 7, and 8 for the study area. The adjusted 2013 and 2035 traffic volumes are shown on Exhibits 9, 10, and 11 for the Baseline, Bridge, and Bromley interchange areas.

Exhibit 7 – 2035 No-Action Traffic Volumes from Compass Model

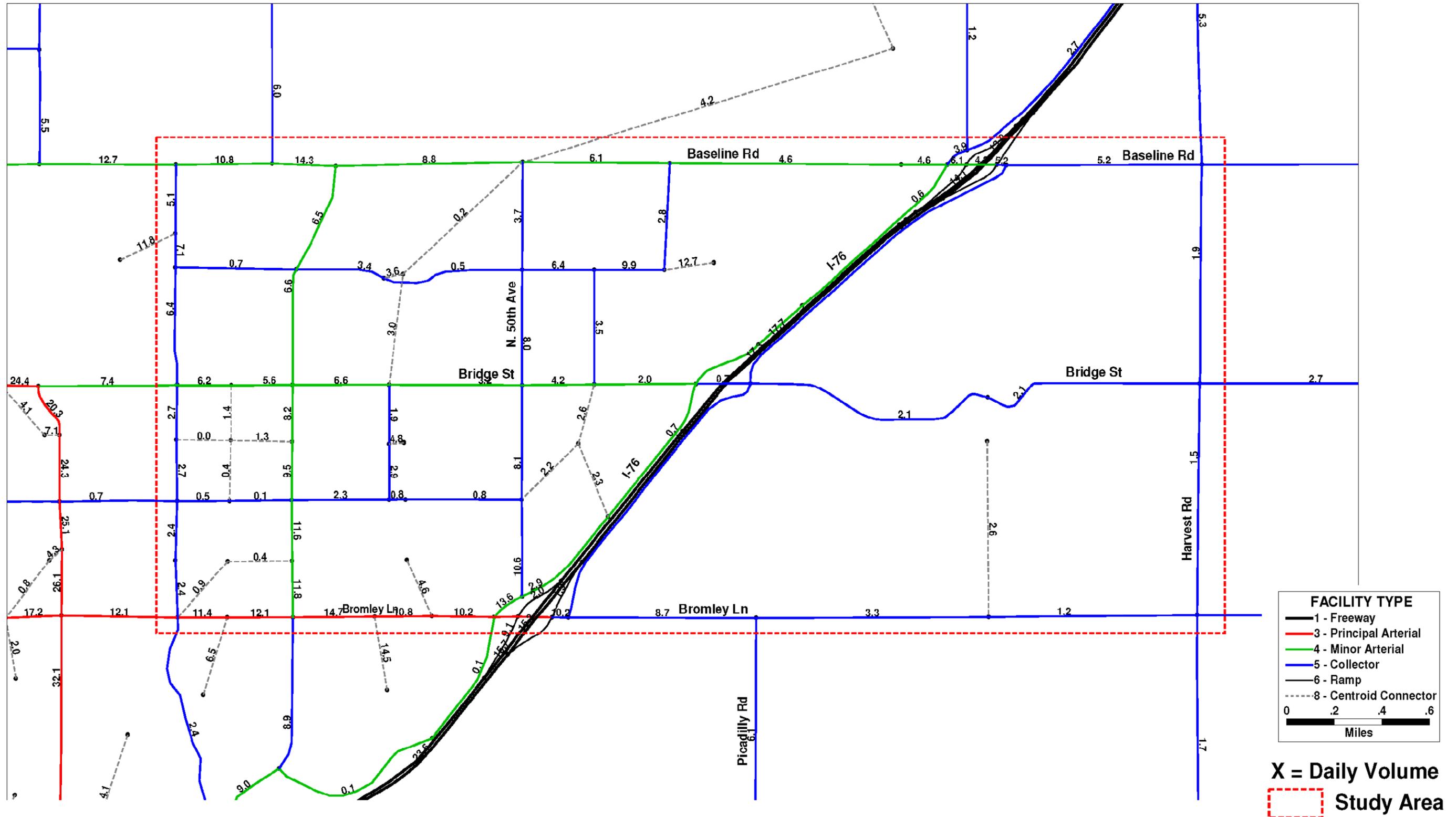
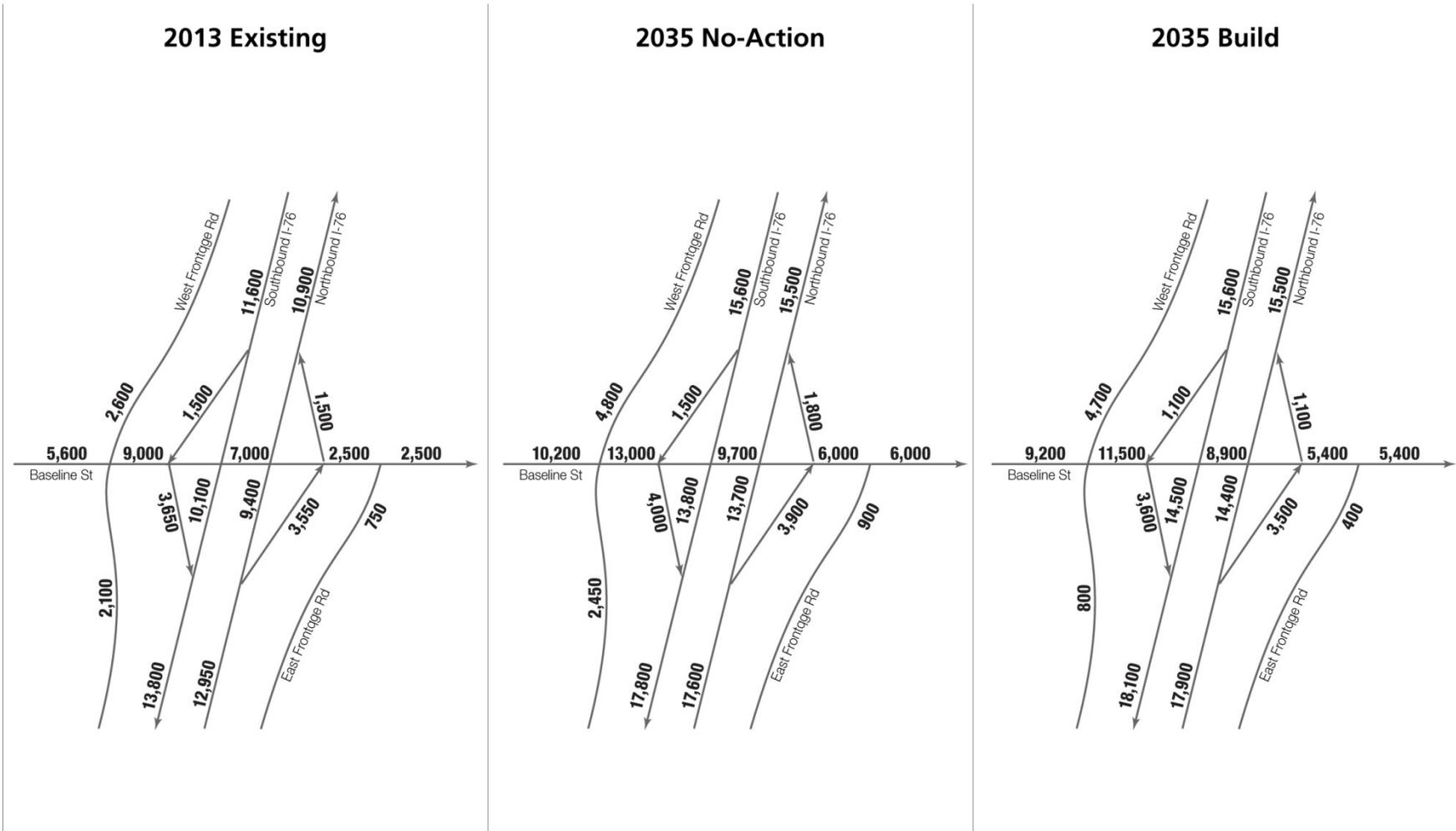
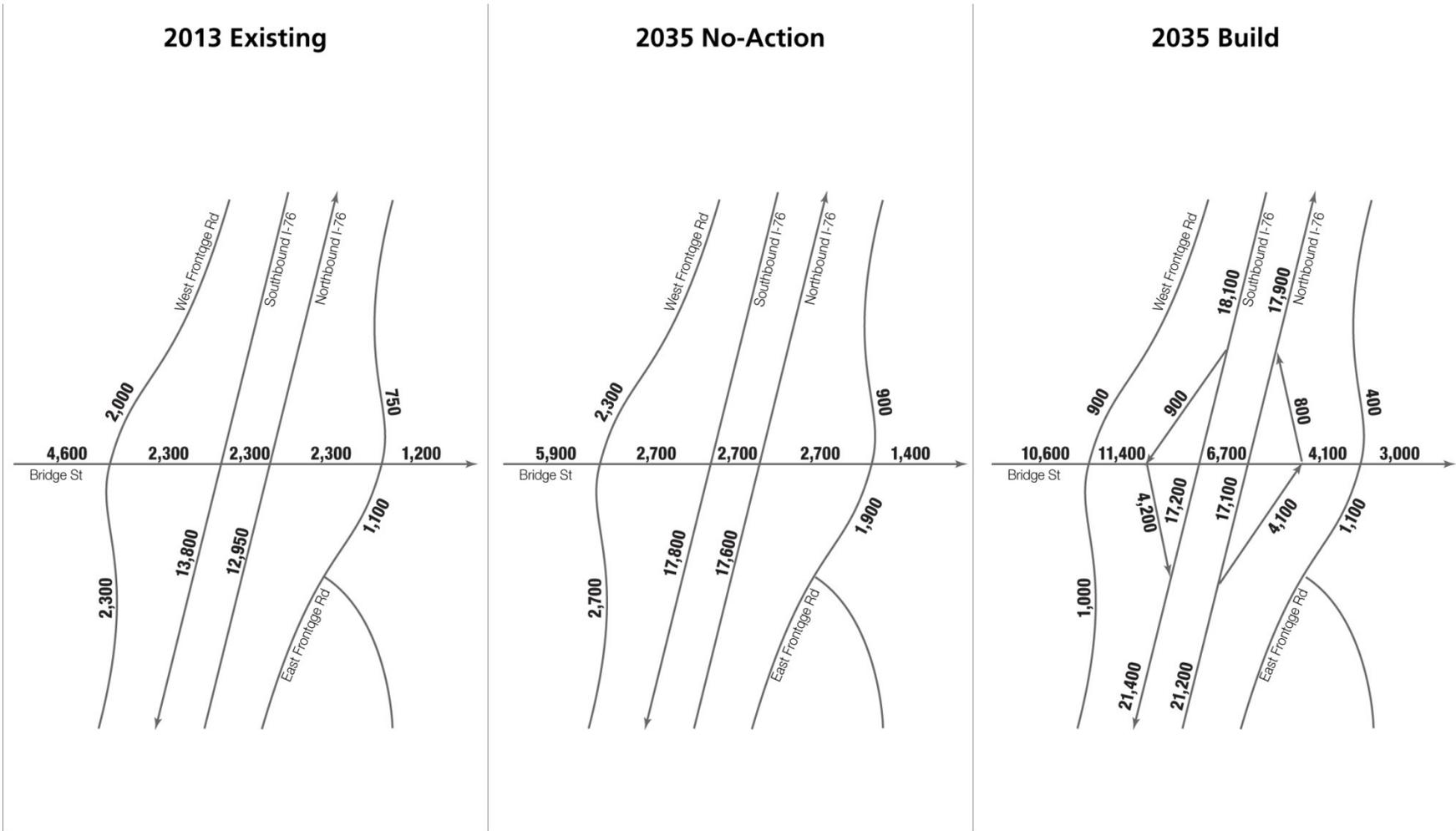


Exhibit 9 – Adjusted Traffic Volumes (Baseline Street Interchange)



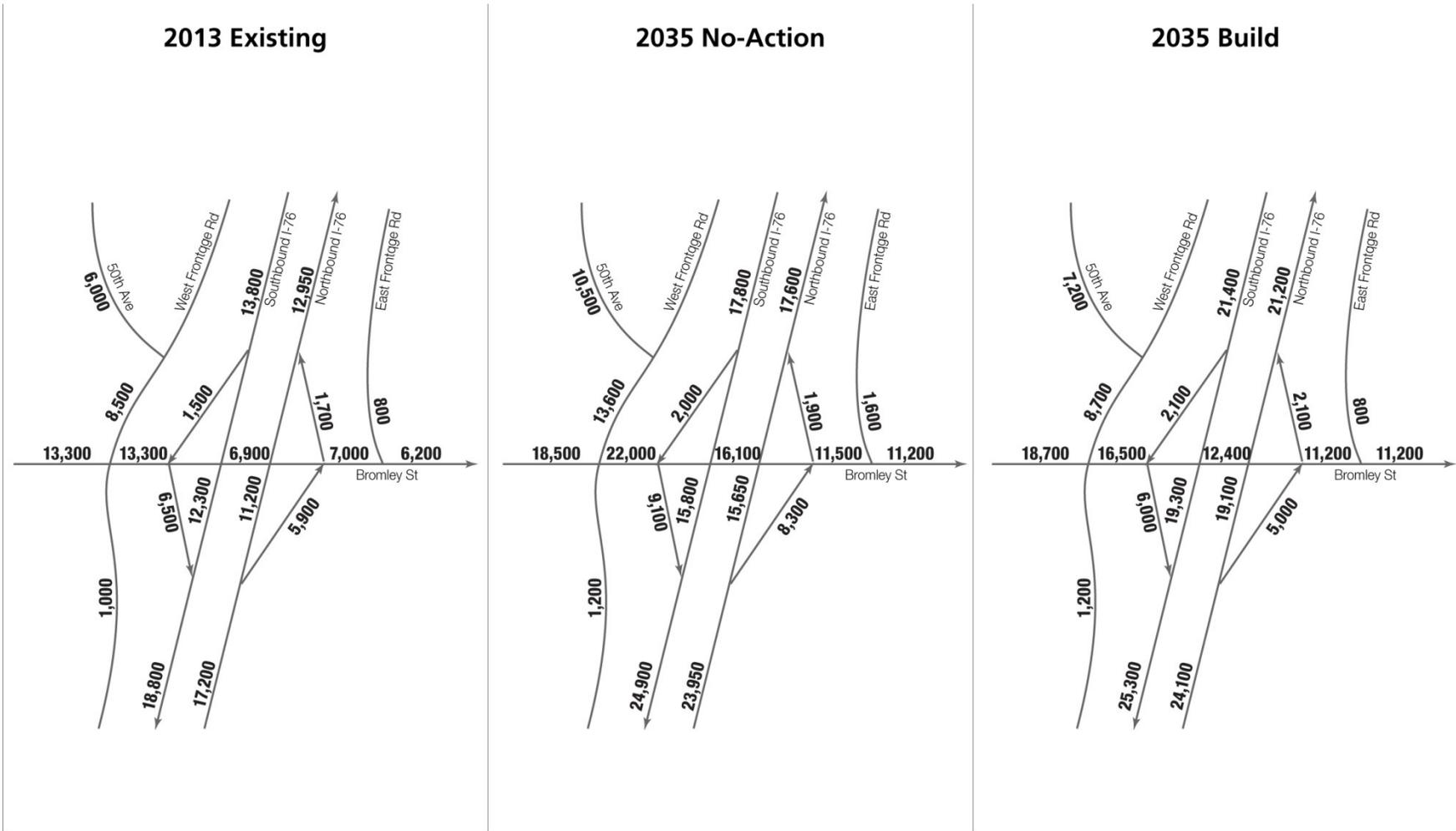
XX,XXX = vehicles per day

Exhibit 10 – Adjusted Traffic Volumes (Bridge Street Interchange)



XX,XXX = vehicles per day

Exhibit 11 – Adjusted Traffic Volumes (Bromley Street Interchange)



XX,XXX = vehicles per day

2.4 PERFORMANCE SUMMARIES

Exhibit 6 summarizes input data and results for the 2010 and 2035 model runs. Information is included for both the interchange study area and the entire DRCOG region. The summaries include roadway network lane-miles and center-line miles to indicate where and what types of improvements are assumed from 2010 to 2035. Vehicle miles of travel (VMT) and congestion delay are also reported in Exhibit 12. Additional VMT information by roadway functional classification is shown in Exhibit 13.

Exhibit 12 – Input Data and Travel Performance Summaries

Study Area						
Measure	2010 / 2013	2035 No- Action	Growth Rate (%/yr., 2010/3 to 2035 No- Action)	2035 Build	Diff. (2035 Build – 2035 No-Action)	Percent Diff. (2035 Build : 2035 No-Action)
Centerline Miles	30.9	35.0	0.5%/yr.	36.0	1.0	2.9%
Lane Miles	38.6	44.9	0.6%/yr.	45.9	1.0	2.2%
VMT (unadjusted model volumes)	123,900	230,000	2.5%/yr.	234,400	4,500	1.9%
Congestion Delay (planning model estimate, daily hours of vehicle delay)	200	740	5.4%/yr.	650	-90	-12.2%

Exhibit 13 – Vehicle Miles of Travel by Roadway Type

VMT by Roadway Functional Class							
Roadway Functional Class	Description	2010 / 2013	2035 No- Action	Growth Rate (%/yr., 2010/3 to 2035 No-Action)	2035 Build	Diff. (2035 Build – 2035 No-Action)	Percent Diff. (2035 Build : 2035 No-Action)
1	Freeway	70,300	109,100	1.8%	119,800	10,700	9.8%
2	Expressway	--	--	--	--	--	--
3	Principal Arterial	8,700	14,800	2.1%	13,600	-1,200	-8.1%
4	Minor Arterial	11,700	49,800	6.0%	47,700	-2,100	-4.2%
5	Collector Street	31,600	53,300	2.1%	47,400	-5,900	-11.1%
6	Ramp	1,600	3,000	2.5%	5,900	2,900	96.7%
Total		123,900	230,000	2.5%	234,400	4,400	1.9%

2.5 TURNING MOVEMENT FORECASTS

Peak hour turning movement forecasts are necessary to support the intersection operational analysis. The forecasted turning movements were estimated based on turning movement counts and base and forecast year model volumes. The analysis utilizes a Fratar process to estimate future turning movements, guarantees that the ins and outs are balanced at each intersection, and ensures that they are consistent with the forecasted approach volumes. Although the intent here is not to fully describe the Fratar process, it is an industry-accepted, iterative process for estimating a unique bi-variate distribution (i.e., matrix of turning movement forecasts) based on established marginals (i.e., approach and departure volume control totals). Essentially, the observed peak hour turning movement counts are “grown” based on the difference between the 2010 and 2035 approach volumes. Then the Fratar process iterates the turning movement matrix until the desired control totals (ins and outs) are matched. This is done separately for both the 2035 No-Build and 2035 Build scenarios.

Appendix D-1
I-76 at Bridge Street Interchange Study
Socioeconomic Data

ZONE ID	Household Population 2010	Household Population 2035	Avg. HHold Size 2010	Avg. HHold Size 2035	Households - 2010				Households - 2035				Employment - 2010				Employment - 2035			
					Low Income	Medium Income	High Income	Total	Low Income	Medium Income	High Income	Total	Production / Distribution	Retail	Service	Total	Production / Distribution	Retail	Service	Total
876	385	810	2.92	2.85	-	95	37	132	-	205	79	284	-	-	1	1	2	1	5	8
877	122	281	2.84	2.78	8	17	18	43	19	40	42	101	-	-	-	-	-	1	3	4
878	223	548	2.86	2.80	7	42	29	78	17	108	71	196	1	-	3	4	1	-	5	6
879	187	506	3.02	2.96	6	34	22	62	16	95	60	171	15	1	-	16	21	1	-	22
880	407	404	2.91	2.85	12	79	49	140	13	80	49	142	10	1	8	19	12	1	9	22
881	493	663	2.85	2.79	15	95	63	173	21	132	85	238	8	2	17	27	11	3	23	37
882	276	1,129	2.85	2.79	8	52	37	97	36	216	152	404	2	-	-	2	6	-	-	6
883	389	2,149	2.84	2.78	-	98	39	137	-	557	216	773	-	-	-	-	8	7	20	35
884	267	1,460	2.90	2.84	17	36	39	92	98	200	216	514	-	-	-	-	-	-	-	-
885	421	2,421	2.88	2.82	19	77	50	146	117	452	288	857	-	-	-	-	1	2	2	5
886	331	1,810	2.90	2.84	-	65	49	114	-	370	267	637	-	-	-	-	-	2	-	2
887	258	284	2.84	2.78	-	13	78	91	-	16	86	102	-	1	1	2	2	6	3	11
888	912	2,514	2.85	2.79	26	180	114	320	75	512	314	901	3	-	2	5	12	-	6	18
889	74	75	2.85	2.78	2	15	9	26	2	16	9	27	-	-	-	-	1	1	3	5
890	282	1,534	2.94	2.88	-	14	82	96	-	85	448	533	-	20	750	770	-	20	741	761
891	131	376	2.85	2.79	4	25	17	46	11	74	50	135	-	-	-	-	-	-	-	-
892	245	1,303	2.85	2.79	-	49	37	86	-	271	196	467	1	1	1	3	4	10	11	25
893	476	473	2.99	2.94	25	76	58	159	26	77	58	161	4	-	1	5	7	-	2	9
908	1,461	3,784	2.98	2.92	-	280	210	490	-	751	544	1,295	-	1	1	2	3	11	8	22
909	276	1,487	2.94	2.88	17	37	40	94	98	202	217	517	-	-	-	-	-	-	-	-
910	235	235	3.01	2.97	15	58	5	78	16	58	5	79	16	51	2	69	16	50	2	68
911	435	599	3.18	3.10	23	105	9	137	34	146	13	193	192	155	327	674	194	156	330	680
912	679	676	3.25	3.19	14	153	42	209	15	155	42	212	35	-	23	58	35	-	23	58
913	798	1,070	2.99	2.92	16	197	54	267	23	270	73	366	57	-	54	111	63	-	60	123
914	1,725	1,807	3.09	3.02	103	418	38	559	114	444	40	598	44	53	680	777	44	53	676	773
915	1,811	2,159	2.94	2.88	41	470	105	616	51	574	125	750	31	247	220	498	32	251	224	507
916	1,122	4,909	2.98	2.92	19	253	104	376	89	1,133	457	1,679	100	1	65	166	152	1	98	251
917	516	2,854	2.67	2.62	-	110	83	193	-	632	458	1,090	-	-	-	-	2	4	1	7
918	1,009	5,658	2.76	2.71	-	53	312	365	-	334	1,756	2,090	5	1	1	7	26	7	4	37
919	1,706	2,295	2.76	2.71	32	417	168	617	45	576	226	847	7	9	137	153	9	11	170	190
920	386	1,928	2.66	2.61	-	21	124	145	-	119	621	740	-	1	3	4	-	3	14	17
921	538	890	2.66	2.61	-	29	173	202	-	55	286	341	1	-	66	67	1	-	86	87
922	2,963	3,552	2.75	2.69	199	722	156	1,077	251	879	188	1,318	63	80	274	417	65	82	281	428
923	2,235	2,324	2.75	2.70	103	603	106	812	113	639	110	862	1	99	759	859	1	101	776	878
924	2,063	2,194	2.92	2.86	91	509	106	706	102	552	113	767	44	98	823	965	43	96	807	946
925	326	435	2.94	2.88	21	80	10	111	30	108	13	151	184	135	174	493	180	132	170	482
926	1,529	1,885	2.93	2.88	111	370	40	521	144	461	50	655	96	324	62	482	98	332	64	494
927	1,296	1,293	2.98	2.92	93	308	34	435	98	311	34	443	-	-	10	10	-	-	10	10
928	1,409	1,489	2.91	2.85	34	371	80	485	38	400	85	523	24	39	226	289	23	38	218	279
929	2,049	2,498	2.79	2.74	43	455	236	734	55	570	288	913	99	2	195	296	107	2	212	321
930	1,326	2,179	2.79	2.73	11	312	152	475	19	528	250	797	7	2	12	21	11	3	19	33
931	435	544	2.77	2.71	6	104	47	157	8	134	59	201	7	-	-	7	10	-	-	10
932	144	777	2.77	2.72	-	8	44	52	-	46	240	286	-	2	221	223	-	2	256	258
933	356	348	2.87	2.81	9	86	29	124	9	87	28	124	162	10	27	199	207	13	35	255
934	1,221	1,481	2.83	2.77	31	299	102	432	40	370	124	534	67	5	7	79	89	7	9	105
935	407	405	2.83	2.77	10	100	34	144	10	102	34	146	4	-	23	27	4	-	22	26
936	267	265	2.87	2.82	7	64	22	93	7	65	22	94	24	3	24	51	22	3	22	47
937	206	201	2.86	2.79	6	49	17	72	6	49	17	72	-	-	314	314	-	-	287	287
938	361	669	2.80	2.74	17	68	44	129	33	129	82	244	79	158	565	802	133	264	946	1,343
939	464	2,662	2.94	2.88	-	158	-	158	-	925	-	925	-	-	1	1	18	18	34	70
940	329	1,835	2.94	2.88	-	88	24	112	-	504	134	638	-	-	-	-	1	2	1	4

Appendix D-1
I-76 at Bridge Street Interchange Study
Socioeconomic Data

ZONE ID	Household Population 2010	Household Population 2035	Avg. HHold Size 2010	Avg. Hhold Size 2035	Households - 2010				Households - 2035				Employment - 2010				Employment - 2035			
					Low Income	Medium Income	High Income	Total	Low Income	Medium Income	High Income	Total	Production / Distribution	Retail	Service	Total	Production / Distribution	Retail	Service	Total
941	158	838	2.77	2.71	-	45	12	57	-	244	65	309	-	-	-	-	1	2	-	3
942	249	1,412	2.74	2.68	-	71	20	91	-	415	111	526	-	-	-	-	-	1	1	2
943	104	526	2.74	2.68	-	27	11	38	-	141	55	196	-	-	-	-	-	-	-	-
944	267	925	2.93	2.87	17	48	26	91	61	171	90	322	-	-	1	1	1	-	5	6
945	401	1,877	2.84	2.78	17	91	33	141	85	432	157	674	-	280	84	364	-	313	94	407
946	23	23	2.88	2.88	-	5	3	8	-	5	3	8	277	5	14	296	297	5	15	317
947	94	404	2.94	2.89	6	17	9	32	27	74	39	140	-	-	-	-	2	1	1	4
948	451	1,960	2.85	2.80	12	110	36	158	53	491	157	701	220	620	40	880	228	643	42	913
949	1,300	1,668	2.91	2.85	44	301	102	447	59	395	131	585	46	40	18	104	59	52	23	134
950	65	174	2.83	2.81	2	16	5	23	6	43	13	62	10	4	10	24	43	15	41	99
951	1,038	5,373	2.88	2.82	38	240	83	361	209	1,267	431	1,907	1	2	4	7	12	14	30	56
952	443	2,462	2.93	2.88	33	92	26	151	195	517	144	856	22	35	38	95	90	145	157	392
953	3	2	3.00	2.00	-	1	-	1	-	1	-	1	-	-	1	1	23	22	47	92
954	361	1,482	2.87	2.81	16	83	27	126	67	352	109	528	11	7	1	19	39	24	5	68
955	175	223	2.87	2.82	8	40	13	61	11	51	17	79	153	2	14	169	164	2	15	181
956	135	343	2.87	2.81	6	32	9	47	16	82	24	122	9	2	1	12	64	15	7	86
957	131	220	2.91	2.86	6	30	9	45	11	50	16	77	123	1	10	134	129	1	10	140
958	718	3,851	2.87	2.81	28	158	64	250	156	868	345	1,369	4	3	7	14	155	106	280	541
959	670	3,700	2.89	2.83	32	163	37	232	186	915	206	1,307	9	4	10	23	99	48	110	257
960	40	39	2.86	2.79	2	9	3	14	2	9	3	14	54	4	3	61	65	5	4	74
961	11	19	2.75	2.71	-	3	1	4	-	5	2	7	-	-	-	-	1	1	3	5
962	55	213	2.75	2.70	-	11	9	20	-	46	33	79	28	24	10	62	72	63	25	160
963	369	1,716	2.91	2.85	10	87	30	127	47	415	140	602	1	1	5	7	3	7	22	32
964	303	1,510	2.89	2.83	10	71	24	105	55	357	122	534	18	-	4	22	37	-	9	46
965	75	76	2.88	2.81	-	22	4	26	-	23	4	27	6	1	2	9	15	3	4	22
966	17	17	2.43	2.43	-	5	2	7	-	5	2	7	-	-	-	-	4	3	8	15
967	5	6	2.50	3.00	-	1	1	2	-	1	1	2	-	-	-	-	-	-	-	-
968	416	1,665	2.91	2.85	10	99	34	143	44	403	137	584	12	8	21	41	452	300	784	1,536
969	1,298	7,288	2.47	2.42	39	366	120	525	229	2,106	674	3,009	19	8	2	29	438	174	44	656
970	3	3	3.00	3.00	-	1	-	1	-	1	-	1	1	1	1	3	43	31	86	160
971	12	11	3.00	2.75	-	3	1	4	-	3	1	4	11	2	2	15	14	2	3	19
972	1,575	8,627	2.91	2.85	54	361	126	541	314	2,018	693	3,025	2	11	6	19	13	74	38	125
973	1,964	9,848	2.91	2.85	29	479	167	675	151	2,466	837	3,454	2	8	37	47	5	21	100	126
974	1,664	3,936	2.91	2.85	70	338	163	571	175	818	386	1,379	-	5	17	22	1	13	41	55
975	3,085	9,591	2.95	2.89	-	790	255	1,045	-	2,520	796	3,316	-	3	1	4	2	22	7	31
976	940	3,623	2.91	2.85	18	223	82	323	72	881	317	1,270	55	29	48	132	144	75	126	345
978	3,979	4,696	2.95	2.89	71	937	340	1,348	88	1,134	402	1,624	19	3	53	75	31	5	88	124
981	446	1,922	2.92	2.85	11	101	41	153	48	449	177	674	8	5	2	15	29	18	8	55
982	262	568	2.91	2.85	4	63	23	90	9	141	49	199	84	5	62	151	93	5	68	166
983	197	195	2.98	2.95	5	44	17	66	5	44	17	66	20	13	100	133	23	15	116	154
2764	559	2,495	2.71	2.66	29	134	43	206	134	608	197	939	5	4	12	21	73	53	183	309
2765	3,724	6,263	2.69	2.64	226	876	280	1,382	388	1,502	482	2,372	29	45	103	177	79	122	280	481
2768	657	1,995	2.42	2.37	36	193	43	272	111	599	133	843	1,538	387	646	2,571	1,675	422	703	2,800
2769	1,233	2,198	3.31	3.24	65	228	80	373	119	414	146	679	67	12	23	102	136	24	46	206
2770	1,235	2,119	3.36	3.29	29	241	98	368	51	422	171	644	353	80	518	951	569	129	834	1,532
2771	820	921	3.00	2.93	21	191	61	273	24	220	70	314	126	3	30	159	155	4	38	197
2772	2,634	2,762	2.91	2.85	76	593	235	904	81	635	252	968	470	191	304	965	487	198	315	1,000
2773	6,095	8,832	3.18	3.11	312	1,325	281	1,918	462	1,959	416	2,837	367	142	227	736	486	188	300	974
2774	2,554	4,639	3.07	3.01	62	575	195	832	115	1,067	361	1,543	183	42	84	309	358	82	165	605
2775	2,106	4,007	2.96	2.90	99	502	110	711	193	974	214	1,381	170	89	114	373	295	155	199	649
2796	3,278	5,810	2.93	2.87	113	695	312	1,120	204	1,258	565	2,027	108	94	199	401	196	171	362	729

**Appendix D-1
I-76 at Bridge Street Interchange Study
Socioeconomic Data**

ZONE ID	Household Population 2010	Household Population 2035	Avg. HHold Size 2010	Avg. Hhold Size 2035	Households - 2010				Households - 2035				Employment - 2010				Employment - 2035			
					Low Income	Medium Income	High Income	Total	Low Income	Medium Income	High Income	Total	Production / Distribution	Retail	Service	Total	Production / Distribution	Retail	Service	Total
2799	102	172	2.68	2.65	6	24	8	38	11	41	13	65	1	1	3	5	2	3	8	13
2800	1,845	2,073	2.99	2.93	48	431	138	617	55	494	158	707	285	7	69	361	350	8	84	442
Total	88,306	203,445	2.91	2.82	2,941	20,009	7,429	30,379	6,228	46,366	19,504	72,098	6,320	3,735	9,041	19,096	9,429	5,502	12,682	27,613



Appendix C

Vehicle Classification Data

C.1 – Daily Traffic Counts

C.2 – Peak-Hour Turning Movements

C.3 – Signal Timings

I-76 & Bridge Street INTERCHANGE



C.1 – Daily Traffic Counts

Location		Baseline Road west of Homestead Avenue					
#1		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	6	2	25%	8	4	33%
1:00 AM	2:00 AM	3	4	57%	9	0	0%
2:00 AM	3:00 AM	14	0	0%	7	1	13%
3:00 AM	4:00 AM	12	3	20%	6	2	25%
4:00 AM	5:00 AM	32	6	16%	21	4	16%
5:00 AM	6:00 AM	84	8	9%	70	5	7%
6:00 AM	7:00 AM	180	25	12%	141	12	8%
7:00 AM	8:00 AM	208	16	7%	182	9	5%
8:00 AM	9:00 AM	132	12	8%	153	9	6%
9:00 AM	10:00 AM	86	16	16%	110	11	9%
10:00 AM	11:00 AM	107	19	15%	98	19	16%
11:00 AM	12:00 PM	118	20	14%	134	17	11%
12:00 PM	1:00 PM	113	14	11%	108	7	6%
1:00 PM	2:00 PM	113	19	14%	114	15	12%
2:00 PM	3:00 PM	142	15	10%	124	14	10%
3:00 PM	4:00 PM	211	23	10%	193	17	8%
4:00 PM	5:00 PM	188	27	13%	254	12	5%
5:00 PM	6:00 PM	219	28	11%	280	21	7%
6:00 PM	7:00 PM	204	14	6%	178	10	5%
7:00 PM	8:00 PM	133	8	6%	144	14	9%
8:00 PM	9:00 PM	113	7	6%	81	4	5%
9:00 PM	10:00 PM	71	7	9%	76	3	4%
10:00 PM	11:00 PM	37	2	5%	28	2	7%
11:00 PM	12:00 AM	13	1	7%	19	0	0%
		2539	296	10%	2538	212	8%

Location 1: BASELINE RD W/O HOMESTEAD AVE (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	0	2	4	1	1	0	0	0	0	8	349	43.625
1:00 AM	2:00 AM	0	0	0	0	1	2	3	1	0	0	0	0	0	7	286	40.85714
2:00 AM	3:00 AM	0	0	0	1	0	6	5	2	0	0	0	0	0	14	567	40.5
3:00 AM	4:00 AM	0	0	0	0	1	0	8	4	2	0	0	0	0	15	675	45
4:00 AM	5:00 AM	1	0	0	0	2	10	16	8	1	0	0	0	0	38	1581	41.60526
5:00 AM	6:00 AM	0	0	0	0	3	28	51	9	1	0	0	0	0	92	3841	41.75
6:00 AM	7:00 AM	6	0	0	0	11	35	97	47	8	1	0	0	0	205	8662	42.25366
7:00 AM	8:00 AM	5	0	0	1	11	27	130	46	3	2	0	0	0	225	9540	42.4
8:00 AM	9:00 AM	2	0	0	0	7	38	65	29	2	3	0	0	0	146	6162	42.20548
9:00 AM	10:00 AM	1	0	0	2	6	22	50	17	5	0	0	0	0	103	4331	42.04854
10:00 AM	11:00 AM	1	0	0	3	5	38	62	13	4	1	0	0	0	127	5263	41.44094
11:00 AM	12:00 PM	5	0	0	2	11	33	76	10	1	0	0	0	0	138	5524	40.02899
12:00 PM	1:00 PM	2	0	0	3	9	31	69	9	3	1	0	0	0	127	5195	40.90551
1:00 PM	2:00 PM	5	0	1	3	15	33	67	9	1	0	0	0	0	134	5272	39.34328
2:00 PM	3:00 PM	2	0	0	0	9	46	81	15	4	0	0	1	0	158	6548	41.44304
3:00 PM	4:00 PM	6	0	1	4	13	84	115	13	0	1	0	0	0	237	9443	39.84388
4:00 PM	5:00 PM	3	0	0	4	11	59	108	27	2	1	0	0	0	215	8851	41.16744
5:00 PM	6:00 PM	5	0	1	10	16	69	123	24	3	0	0	0	0	251	10103	40.251
6:00 PM	7:00 PM	8	0	0	6	16	65	110	15	3	1	0	0	0	224	8913	39.79018
7:00 PM	8:00 PM	1	0	0	6	14	49	58	12	1	1	0	0	0	142	5683	40.02113
8:00 PM	9:00 PM	0	0	2	9	19	54	34	2	0	0	0	0	0	120	4535	37.79167
9:00 PM	10:00 PM	0	0	0	2	13	29	28	6	0	0	0	0	0	78	3079	39.47436
10:00 PM	11:00 PM	0	0	0	1	6	11	19	2	1	0	0	0	0	40	1610	40.25
11:00 PM	12:00 AM	0	0	0	0	0	6	6	1	1	0	0	0	0	14	587	41.92857
															2858	116600	40.79776

Location 1: BASELINE RD W/O HOMESTEAD AVE (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	5	0	0	1	11	27	130	46	3	2	0	0	0	225	9540	42.4
1:00 AM	2:00 AM	2	0	0	0	7	38	65	29	2	3	0	0	0	146	6162	42.20548
2:00 AM	3:00 AM	1	0	0	2	6	22	50	17	5	0	0	0	0	103	4331	42.04854
3:00 AM	4:00 AM	1	0	0	3	5	38	62	13	4	1	0	0	0	127	5263	41.44094
4:00 AM	5:00 AM	5	0	0	2	11	33	76	10	1	0	0	0	0	138	5524	40.02899
5:00 AM	6:00 AM	2	0	0	3	9	31	69	9	3	1	0	0	0	127	5195	40.90551
6:00 AM	7:00 AM	5	0	1	3	15	33	67	9	1	0	0	0	0	134	5272	39.34328
7:00 AM	8:00 AM	2	0	0	0	9	46	81	15	4	0	0	1	0	158	6548	41.44304
8:00 AM	9:00 AM	6	0	1	4	13	84	115	13	0	1	0	0	0	237	9443	39.84388
9:00 AM	10:00 AM	3	0	0	4	11	59	108	27	2	1	0	0	0	215	8851	41.16744
10:00 AM	11:00 AM	5	0	1	10	16	69	123	24	3	0	0	0	0	251	10103	40.251
11:00 AM	12:00 PM	8	0	0	6	16	65	110	15	3	1	0	0	0	224	8913	39.79018
12:00 PM	1:00 PM	1	0	0	6	14	49	58	12	1	1	0	0	0	142	5683	40.02113
1:00 PM	2:00 PM	0	0	2	9	19	54	34	2	0	0	0	0	0	120	4535	37.79167
2:00 PM	3:00 PM	0	0	0	2	13	29	28	6	0	0	0	0	0	78	3079	39.47436
3:00 PM	4:00 PM	0	0	0	1	6	11	19	2	1	0	0	0	0	40	1610	40.25
4:00 PM	5:00 PM	0	0	0	0	0	6	6	1	1	0	0	0	0	14	587	41.92857
5:00 PM	6:00 PM	0	0	0	0	0	2	4	1	1	0	0	0	0	8	349	43.625
6:00 PM	7:00 PM	1	0	0	1	4	18	32	15	3	0	0	0	0	74	3109	42.01351
7:00 PM	8:00 PM	13	0	0	1	32	128	343	131	14	6	0	0	0	668	28205	42.22305
8:00 PM	9:00 PM	9	0	0	10	31	124	257	49	13	2	0	0	0	495	20313	41.03636
9:00 PM	10:00 PM	16	0	2	11	48	222	371	64	7	2	0	1	0	744	30114	40.47581
10:00 PM	11:00 PM	14	0	3	31	65	237	325	53	7	2	0	0	0	737	29234	39.66621
11:00 PM	12:00 AM	0	0	0	3	19	46	53	9	2	0	0	0	0	132	5276	39.9697
															5337	217239	40.70433

Location		Baseline Road west of Harvest Road					
#2		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	3	0	0%	0	1	100%
1:00 AM	2:00 AM	6	0	0%	1	0	0%
2:00 AM	3:00 AM	4	0	0%	4	0	0%
3:00 AM	4:00 AM	0	0	#DIV/0!	2	0	0%
4:00 AM	5:00 AM	3	0	0%	13	1	7%
5:00 AM	6:00 AM	7	2	22%	57	7	11%
6:00 AM	7:00 AM	26	5	16%	113	31	22%
7:00 AM	8:00 AM	24	9	27%	167	24	13%
8:00 AM	9:00 AM	39	0	0%	103	5	5%
9:00 AM	10:00 AM	42	6	13%	50	9	15%
10:00 AM	11:00 AM	34	6	15%	52	12	19%
11:00 AM	12:00 PM	46	3	6%	56	4	7%
12:00 PM	1:00 PM	44	4	8%	37	3	8%
1:00 PM	2:00 PM	57	6	10%	42	6	13%
2:00 PM	3:00 PM	64	9	12%	47	9	16%
3:00 PM	4:00 PM	109	3	3%	70	12	15%
4:00 PM	5:00 PM	133	11	8%	60	4	6%
5:00 PM	6:00 PM	164	12	7%	64	10	14%
6:00 PM	7:00 PM	109	9	8%	41	8	16%
7:00 PM	8:00 PM	90	4	4%	32	6	16%
8:00 PM	9:00 PM	60	3	5%	24	3	11%
9:00 PM	10:00 PM	45	1	2%	17	2	11%
10:00 PM	11:00 PM	29	2	6%	8	2	20%
11:00 PM	12:00 AM	13	0	0%	2	0	0%
		1151	95	8%	1062	159	13%

Location 1: BASELINE RD W/O HARVEST ROAD (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	1	0	1	0	0	1	0	0	0	0	3	119	39.66667
1:00 AM	2:00 AM	0	0	0	0	0	0	3	1	1	1	0	0	0	6	288	48
2:00 AM	3:00 AM	1	0	0	0	0	1	1	1	0	0	0	0	0	4	139	34.75
3:00 AM	4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
4:00 AM	5:00 AM	0	0	0	0	0	0	1	1	0	1	0	0	0	3	149	49.66667
5:00 AM	6:00 AM	1	0	0	0	0	0	6	2	0	0	0	0	0	9	364	40.44444
6:00 AM	7:00 AM	6	0	0	0	1	1	10	8	6	0	0	0	0	32	1263	39.46875
7:00 AM	8:00 AM	0	0	0	0	0	6	10	9	7	1	0	0	0	33	1519	46.0303
8:00 AM	9:00 AM	1	0	0	0	2	2	11	13	8	2	0	0	0	39	1789	45.87179
9:00 AM	10:00 AM	4	3	1	1	0	6	16	5	11	0	0	1	0	48	1952	40.66667
10:00 AM	11:00 AM	2	0	2	0	4	7	10	11	2	2	0	0	0	40	1644	41.1
11:00 AM	12:00 PM	0	1	0	0	1	4	11	21	11	0	0	0	0	49	2267	46.26531
12:00 PM	1:00 PM	3	0	0	1	1	3	18	13	6	2	1	0	0	48	2100	43.75
1:00 PM	2:00 PM	1	0	1	1	3	8	12	19	12	6	0	0	0	63	2876	45.65079
2:00 PM	3:00 PM	5	0	0	0	2	4	19	23	17	2	0	1	0	73	3274	44.84932
3:00 PM	4:00 PM	4	1	0	3	1	8	38	27	25	4	1	0	0	112	5029	44.90179
4:00 PM	5:00 PM	0	1	3	5	7	24	38	32	25	10	0	0	0	145	6445	44.44828
5:00 PM	6:00 PM	2	0	2	1	7	24	67	47	26	2	0	0	0	178	7868	44.20225
6:00 PM	7:00 PM	0	0	0	0	2	9	37	43	26	1	0	0	0	118	5499	46.60169
7:00 PM	8:00 PM	3	0	0	0	1	11	30	30	17	2	1	0	0	95	4291	45.16842
8:00 PM	9:00 PM	3	0	1	0	1	7	21	19	8	4	0	0	0	64	2823	44.10938
9:00 PM	10:00 PM	0	0	0	0	0	4	15	8	16	2	1	0	0	46	2208	48
10:00 PM	11:00 PM	0	0	0	0	1	4	7	11	5	2	1	0	0	31	1458	47.03226
11:00 PM	12:00 AM	2	0	0	0	0	2	2	4	3	0	0	0	0	13	533	41
															1252	55897	44.64617

Location 1: BASELINE RD W/O HARVEST ROAD (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	0	6	10	9	7	1	0	0	0	33	1519	46.0303
1:00 AM	2:00 AM	1	0	0	0	2	2	11	13	8	2	0	0	0	39	1789	45.87179
2:00 AM	3:00 AM	4	3	1	1	0	6	16	5	11	0	0	1	0	48	1952	40.66667
3:00 AM	4:00 AM	2	0	2	0	4	7	10	11	2	2	0	0	0	40	1644	41.1
4:00 AM	5:00 AM	0	1	0	0	1	4	11	21	11	0	0	0	0	49	2267	46.26531
5:00 AM	6:00 AM	3	0	0	1	1	3	18	13	6	2	1	0	0	48	2100	43.75
6:00 AM	7:00 AM	1	0	1	1	3	8	12	19	12	6	0	0	0	63	2876	45.65079
7:00 AM	8:00 AM	5	0	0	0	2	4	19	23	17	2	0	1	0	73	3274	44.84932
8:00 AM	9:00 AM	4	1	0	3	1	8	38	27	25	4	1	0	0	112	5029	44.90179
9:00 AM	10:00 AM	0	1	3	5	7	24	38	32	25	10	0	0	0	145	6445	44.44828
10:00 AM	11:00 AM	2	0	2	1	7	24	67	47	26	2	0	0	0	178	7868	44.20225
11:00 AM	12:00 PM	0	0	0	0	2	9	37	43	26	1	0	0	0	118	5499	46.60169
12:00 PM	1:00 PM	3	0	0	0	1	11	30	30	17	2	1	0	0	95	4291	45.16842
1:00 PM	2:00 PM	3	0	1	0	1	7	21	19	8	4	0	0	0	64	2823	44.10938
2:00 PM	3:00 PM	0	0	0	0	0	4	15	8	16	2	1	0	0	46	2208	48
3:00 PM	4:00 PM	0	0	0	0	1	4	7	11	5	2	1	0	0	31	1458	47.03226
4:00 PM	5:00 PM	2	0	0	0	0	2	2	4	3	0	0	0	0	13	533	41
5:00 PM	6:00 PM	0	0	0	1	0	1	0	0	1	0	0	0	0	3	119	39.66667
6:00 PM	7:00 PM	1	0	0	0	0	1	5	3	1	2	0	0	0	13	576	44.30769
7:00 PM	8:00 PM	8	0	0	0	3	9	37	32	21	3	0	0	0	113	4935	43.67257
8:00 PM	9:00 PM	9	4	3	2	6	20	55	50	30	4	1	1	0	185	7963	43.04324
9:00 PM	10:00 PM	10	2	4	9	13	44	107	101	79	22	1	1	0	393	17624	44.84478
10:00 PM	11:00 PM	8	0	3	1	11	51	155	139	77	9	1	0	0	455	20481	45.01319
11:00 PM	12:00 AM	2	0	0	0	1	10	24	23	24	4	2	0	0	90	4199	46.65556
															2447	109472	44.73723

Location		Bridge Street west of West Frontage Road					
#3		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	5	0	0%	4	0	0%
1:00 AM	2:00 AM	5	0	0%	6	1	14%
2:00 AM	3:00 AM	4	1	20%	10	0	0%
3:00 AM	4:00 AM	3	0	0%	5	0	0%
4:00 AM	5:00 AM	7	2	22%	17	2	11%
5:00 AM	6:00 AM	30	6	17%	44	3	6%
6:00 AM	7:00 AM	95	11	10%	128	7	5%
7:00 AM	8:00 AM	150	24	14%	165	16	9%
8:00 AM	9:00 AM	169	18	10%	135	9	6%
9:00 AM	10:00 AM	93	21	18%	76	16	17%
10:00 AM	11:00 AM	75	15	17%	74	19	20%
11:00 AM	12:00 PM	87	13	13%	91	13	13%
12:00 PM	1:00 PM	95	17	15%	91	16	15%
1:00 PM	2:00 PM	94	13	12%	88	18	17%
2:00 PM	3:00 PM	90	27	23%	116	22	16%
3:00 PM	4:00 PM	180	27	13%	172	33	16%
4:00 PM	5:00 PM	185	32	15%	159	23	13%
5:00 PM	6:00 PM	212	46	18%	170	27	14%
6:00 PM	7:00 PM	127	19	13%	134	19	12%
7:00 PM	8:00 PM	88	19	18%	118	16	12%
8:00 PM	9:00 PM	59	6	9%	94	12	11%
9:00 PM	10:00 PM	36	6	14%	58	6	9%
10:00 PM	11:00 PM	21	5	19%	26	4	13%
11:00 PM	12:00 AM	17	2	11%	14	0	0%
		1927	330	15%	1995	282	12%

Location 1: Bridge Street west of West Frontage Road (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	1	4	0	0	0	0	0	0	0	5	185	37
1:00 AM	2:00 AM	0	0	0	0	1	1	0	2	1	0	0	0	0	5	220	44
2:00 AM	3:00 AM	0	0	0	0	0	1	2	2	0	0	0	0	0	5	220	44
3:00 AM	4:00 AM	0	0	0	0	1	0	2	0	0	0	0	0	0	3	119	39.66667
4:00 AM	5:00 AM	0	0	0	1	1	3	3	1	0	0	0	0	0	9	352	39.11111
5:00 AM	6:00 AM	4	0	0	0	4	9	12	2	5	1	0	0	0	37	1449	39.16216
6:00 AM	7:00 AM	5	0	0	1	3	21	31	22	22	4	0	0	0	109	4762	43.68807
7:00 AM	8:00 AM	7	0	0	2	5	19	52	54	28	10	2	0	0	179	8031	44.86592
8:00 AM	9:00 AM	8	0	1	0	2	26	76	55	16	6	1	0	0	191	8324	43.58115
9:00 AM	10:00 AM	4	0	1	0	3	31	28	32	10	5	0	0	0	114	4900	42.98246
10:00 AM	11:00 AM	0	0	0	0	4	19	24	25	15	5	0	0	0	92	4171	45.33696
11:00 AM	12:00 PM	0	0	0	0	2	10	37	24	17	7	2	0	1	100	4695	46.95
12:00 PM	1:00 PM	2	0	1	1	5	10	29	33	23	5	2	1	0	112	5150	45.98214
1:00 PM	2:00 PM	2	0	0	0	3	17	39	27	9	7	3	1	0	108	4878	45.16667
2:00 PM	3:00 PM	0	0	1	0	2	10	31	38	25	10	0	0	0	117	5531	47.2735
3:00 PM	4:00 PM	1	0	0	0	6	42	65	60	29	4	0	1	0	208	9316	44.78846
4:00 PM	5:00 PM	3	0	0	1	3	22	59	75	35	16	2	1	0	217	10107	46.57604
5:00 PM	6:00 PM	3	0	0	2	4	29	85	70	48	15	2	0	0	258	11875	46.02713
6:00 PM	7:00 PM	0	0	0	0	2	26	45	41	22	9	1	0	0	146	6708	45.94521
7:00 PM	8:00 PM	2	0	0	0	1	22	34	30	14	2	2	0	0	107	4775	44.62617
8:00 PM	9:00 PM	0	0	0	0	2	19	25	16	2	1	0	0	0	65	2795	43
9:00 PM	10:00 PM	0	0	1	2	4	14	13	5	3	0	0	0	0	42	1701	40.5
10:00 PM	11:00 PM	1	0	0	0	2	11	5	5	2	0	0	0	0	26	1055	40.57692
11:00 PM	12:00 AM	0	0	0	0	0	10	6	1	2	1	0	0	0	20	850	42.5
															2275	102169	44.90945

Location 1: Bridge Street west of West Frontage Road (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	7	0	0	2	5	19	52	54	28	10	2	0	0	179	8031	44.86592
1:00 AM	2:00 AM	8	0	1	0	2	26	76	55	16	6	1	0	0	191	8324	43.58115
2:00 AM	3:00 AM	4	0	1	0	3	31	28	32	10	5	0	0	0	114	4900	42.98246
3:00 AM	4:00 AM	0	0	0	0	4	19	24	25	15	5	0	0	0	92	4171	45.33696
4:00 AM	5:00 AM	0	0	0	0	2	10	37	24	17	7	2	0	1	100	4695	46.95
5:00 AM	6:00 AM	2	0	1	1	5	10	29	33	23	5	2	1	0	112	5150	45.98214
6:00 AM	7:00 AM	2	0	0	0	3	17	39	27	9	7	3	1	0	108	4878	45.16667
7:00 AM	8:00 AM	0	0	1	0	2	10	31	38	25	10	0	0	0	117	5531	47.2735
8:00 AM	9:00 AM	1	0	0	0	6	42	65	60	29	4	0	1	0	208	9316	44.78846
9:00 AM	10:00 AM	3	0	0	1	3	22	59	75	35	16	2	1	0	217	10107	46.57604
10:00 AM	11:00 AM	3	0	0	2	4	29	85	70	48	15	2	0	0	258	11875	46.02713
11:00 AM	12:00 PM	0	0	0	0	2	26	45	41	22	9	1	0	0	146	6708	45.94521
12:00 PM	1:00 PM	2	0	0	0	1	22	34	30	14	2	2	0	0	107	4775	44.62617
1:00 PM	2:00 PM	0	0	0	0	2	19	25	16	2	1	0	0	0	65	2795	43
2:00 PM	3:00 PM	0	0	1	2	4	14	13	5	3	0	0	0	0	42	1701	40.5
3:00 PM	4:00 PM	1	0	0	0	2	11	5	5	2	0	0	0	0	26	1055	40.57692
4:00 PM	5:00 PM	0	0	0	0	0	10	6	1	2	1	0	0	0	20	850	42.5
5:00 PM	6:00 PM	0	0	0	0	1	4	0	0	0	0	0	0	0	5	185	37
6:00 PM	7:00 PM	0	0	0	1	3	5	7	5	1	0	0	0	0	22	911	41.40909
7:00 PM	8:00 PM	24	0	1	3	14	75	171	133	71	21	3	0	0	516	22566	43.73256
8:00 PM	9:00 PM	6	0	2	1	14	70	118	114	65	22	4	1	1	418	18916	45.25359
9:00 PM	10:00 PM	6	0	1	1	14	91	194	200	98	37	5	3	0	650	29832	45.89538
10:00 PM	11:00 PM	5	0	0	2	9	96	189	157	86	27	5	0	0	576	26153	45.40451
11:00 PM	12:00 AM	1	0	1	2	6	35	24	11	7	1	0	0	0	88	3606	40.97727
															4377	197031	45.01508

Location		Bridge Street over I-76					
#4		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	0	0	#DIV/0!	1	0	0%
1:00 AM	2:00 AM	4	1	20%	2	0	0%
2:00 AM	3:00 AM	4	0	0%	0	0	#DIV/0!
3:00 AM	4:00 AM	0	0	#DIV/0!	0	0	#DIV/0!
4:00 AM	5:00 AM	6	0	0%	1	2	67%
5:00 AM	6:00 AM	11	0	0%	11	2	15%
6:00 AM	7:00 AM	45	1	2%	53	6	10%
7:00 AM	8:00 AM	92	8	8%	98	15	13%
8:00 AM	9:00 AM	80	1	1%	82	4	5%
9:00 AM	10:00 AM	40	5	11%	43	12	22%
10:00 AM	11:00 AM	42	6	13%	36	7	16%
11:00 AM	12:00 PM	44	0	0%	50	3	6%
12:00 PM	1:00 PM	51	3	6%	52	3	5%
1:00 PM	2:00 PM	51	6	11%	40	6	13%
2:00 PM	3:00 PM	51	7	12%	55	7	11%
3:00 PM	4:00 PM	121	15	11%	74	8	10%
4:00 PM	5:00 PM	96	7	7%	119	8	6%
5:00 PM	6:00 PM	100	7	7%	105	5	5%
6:00 PM	7:00 PM	82	5	6%	59	2	3%
7:00 PM	8:00 PM	69	3	4%	34	5	13%
8:00 PM	9:00 PM	53	4	7%	21	1	5%
9:00 PM	10:00 PM	38	2	5%	12	0	0%
10:00 PM	11:00 PM	14	0	0%	7	0	0%
11:00 PM	12:00 AM	12	0	0%	7	1	13%
		1106	81	7%	962	97	9%

Location 4: Bridge Street over I-76 (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
1:00 AM	2:00 AM	0	0	0	0	0	1	1	2	1	0	0	0	0	5	230	46
2:00 AM	3:00 AM	0	0	0	0	2	1	1	0	0	0	0	0	0	4	147	36.75
3:00 AM	4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
4:00 AM	5:00 AM	0	0	0	0	1	3	2	0	0	0	0	0	0	6	233	38.83333
5:00 AM	6:00 AM	0	0	0	0	1	5	2	3	0	0	0	0	0	11	453	41.18182
6:00 AM	7:00 AM	0	0	0	2	5	13	13	11	2	0	0	0	0	46	1908	41.47826
7:00 AM	8:00 AM	0	0	1	5	16	25	36	15	4	0	0	0	0	102	4121	40.40196
8:00 AM	9:00 AM	3	1	0	8	12	19	31	9	0	0	0	0	0	83	3155	38.01205
9:00 AM	10:00 AM	0	0	0	3	8	16	10	6	2	0	0	0	0	45	1780	39.55556
10:00 AM	11:00 AM	2	0	0	2	6	16	18	7	0	0	0	0	0	51	1992	39.05882
11:00 AM	12:00 PM	1	0	2	0	3	19	13	6	1	0	0	0	0	45	1777	39.48889
12:00 PM	1:00 PM	0	0	3	1	7	15	21	6	1	1	0	0	0	55	2200	40
1:00 PM	2:00 PM	4	0	3	0	7	19	21	3	1	0	0	0	0	58	2162	37.27586
2:00 PM	3:00 PM	0	0	0	4	7	18	23	6	1	0	0	0	0	59	2357	39.94915
3:00 PM	4:00 PM	1	0	5	9	24	39	41	15	2	1	0	0	0	137	5298	38.67153
4:00 PM	5:00 PM	2	0	2	10	12	37	33	7	1	0	0	0	0	104	3956	38.03846
5:00 PM	6:00 PM	0	1	1	3	11	25	45	16	5	1	0	0	0	108	4464	41.33333
6:00 PM	7:00 PM	1	0	2	4	12	34	25	7	2	1	0	0	0	88	3431	38.98864
7:00 PM	8:00 PM	1	0	0	4	9	26	22	10	0	0	0	0	0	72	2833	39.34722
8:00 PM	9:00 PM	0	0	1	2	9	26	17	0	1	1	0	0	0	57	2206	38.70175
9:00 PM	10:00 PM	0	0	0	1	14	16	7	2	0	0	0	0	0	40	1495	37.375
10:00 PM	11:00 PM	0	0	0	0	3	6	4	1	0	0	0	0	0	14	547	39.07143
11:00 PM	12:00 AM	0	0	0	3	2	4	3	0	0	0	0	0	0	12	431	35.91667
															1202	47176	39.24792

Location 4: Bridge Street over I-76 (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	1	5	16	25	36	15	4	0	0	0	0	102	4121	40.40196
1:00 AM	2:00 AM	3	1	0	8	12	19	31	9	0	0	0	0	0	83	3155	38.01205
2:00 AM	3:00 AM	0	0	0	3	8	16	10	6	2	0	0	0	0	45	1780	39.55556
3:00 AM	4:00 AM	2	0	0	2	6	16	18	7	0	0	0	0	0	51	1992	39.05882
4:00 AM	5:00 AM	1	0	2	0	3	19	13	6	1	0	0	0	0	45	1777	39.48889
5:00 AM	6:00 AM	0	0	3	1	7	15	21	6	1	1	0	0	0	55	2200	40
6:00 AM	7:00 AM	4	0	3	0	7	19	21	3	1	0	0	0	0	58	2162	37.27586
7:00 AM	8:00 AM	0	0	0	4	7	18	23	6	1	0	0	0	0	59	2357	39.94915
8:00 AM	9:00 AM	1	0	5	9	24	39	41	15	2	1	0	0	0	137	5298	38.67153
9:00 AM	10:00 AM	2	0	2	10	12	37	33	7	1	0	0	0	0	104	3956	38.03846
10:00 AM	11:00 AM	0	1	1	3	11	25	45	16	5	1	0	0	0	108	4464	41.33333
11:00 AM	12:00 PM	1	0	2	4	12	34	25	7	2	1	0	0	0	88	3431	38.98864
12:00 PM	1:00 PM	1	0	0	4	9	26	22	10	0	0	0	0	0	72	2833	39.34722
1:00 PM	2:00 PM	0	0	1	2	9	26	17	0	1	1	0	0	0	57	2206	38.70175
2:00 PM	3:00 PM	0	0	0	1	14	16	7	2	0	0	0	0	0	40	1495	37.375
3:00 PM	4:00 PM	0	0	0	0	3	6	4	1	0	0	0	0	0	14	547	39.07143
4:00 PM	5:00 PM	0	0	0	3	2	4	3	0	0	0	0	0	0	12	431	35.91667
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
6:00 PM	7:00 PM	0	0	0	0	3	5	4	2	1	0	0	0	0	15	610	40.66667
7:00 PM	8:00 PM	3	1	1	15	34	62	82	38	6	0	0	0	0	242	9637	39.82231
8:00 PM	9:00 PM	3	0	5	6	24	66	62	25	4	1	0	0	0	196	7749	39.53571
9:00 PM	10:00 PM	7	0	10	23	50	113	118	31	5	1	0	0	0	358	13773	38.47207
10:00 PM	11:00 PM	2	1	4	13	41	111	109	33	8	3	0	0	0	325	12934	39.79692
11:00 PM	12:00 AM	0	0	0	4	19	26	14	3	0	0	0	0	0	66	2473	37.4697
															2332	91381	39.18568

Location		Bridge Street east of East Frontage Road					
#5		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	0	0	0%	0	0	0%
1:00 AM	2:00 AM	0	0	0%	1	0	0%
2:00 AM	3:00 AM	0	0	0%	3	0	0%
3:00 AM	4:00 AM	0	0	0%	0	0	0%
4:00 AM	5:00 AM	1	1	50%	1	0	0%
5:00 AM	6:00 AM	6	0	0%	2	0	0%
6:00 AM	7:00 AM	40	11	22%	14	1	7%
7:00 AM	8:00 AM	48	7	13%	17	4	19%
8:00 AM	9:00 AM	45	5	10%	33	4	11%
9:00 AM	10:00 AM	20	6	23%	12	4	25%
10:00 AM	11:00 AM	18	4	18%	22	8	27%
11:00 AM	12:00 PM	33	5	13%	19	4	17%
12:00 PM	1:00 PM	22	4	15%	21	9	30%
1:00 PM	2:00 PM	24	3	11%	25	6	19%
2:00 PM	3:00 PM	25	7	22%	31	7	18%
3:00 PM	4:00 PM	42	5	11%	56	18	24%
4:00 PM	5:00 PM	34	4	11%	49	14	22%
5:00 PM	6:00 PM	32	4	11%	61	13	18%
6:00 PM	7:00 PM	37	1	3%	50	12	19%
7:00 PM	8:00 PM	17	3	15%	36	4	10%
8:00 PM	9:00 PM	12	1	8%	24	7	23%
9:00 PM	10:00 PM	5	1	17%	23	3	12%
10:00 PM	11:00 PM	3	1	25%	6	1	14%
11:00 PM	12:00 AM	1	1	50%	6	1	14%
		465	74	14%	512	120	19%

Location 5: Bridge Street east of East Frontage Road (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
1:00 AM	2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
2:00 AM	3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
3:00 AM	4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
4:00 AM	5:00 AM	0	0	0	0	0	0	0	1	1	0	0	0	0	2	101	50.5
5:00 AM	6:00 AM	0	0	0	0	0	1	2	2	0	1	0	0	0	6	278	46.33333
6:00 AM	7:00 AM	0	0	2	0	3	6	10	13	11	5	1	0	0	51	2363	46.33333
7:00 AM	8:00 AM	0	0	1	0	2	3	14	15	14	3	3	0	0	55	2630	47.81818
8:00 AM	9:00 AM	0	0	0	0	1	7	12	17	7	2	4	0	0	50	2370	47.4
9:00 AM	10:00 AM	0	0	0	1	0	4	10	5	5	0	1	0	0	26	1178	45.30769
10:00 AM	11:00 AM	0	1	0	0	1	1	7	12	1	1	1	0	0	25	1140	45.6
11:00 AM	12:00 PM	0	0	0	0	1	6	10	8	10	3	0	0	0	38	1779	46.81579
12:00 PM	1:00 PM	0	0	0	0	0	3	8	6	7	2	1	0	0	27	1296	48
1:00 PM	2:00 PM	0	0	0	0	0	3	6	10	7	1	1	0	0	28	1344	48
2:00 PM	3:00 PM	0	0	0	0	0	2	9	11	7	3	0	0	0	32	1536	48
3:00 PM	4:00 PM	1	0	0	0	1	7	14	8	13	1	2	0	0	47	2168	46.12766
4:00 PM	5:00 PM	0	0	0	0	0	5	12	10	6	4	1	0	0	38	1799	47.34211
5:00 PM	6:00 PM	1	0	0	1	0	4	10	10	10	0	0	0	0	36	1630	45.27778
6:00 PM	7:00 PM	0	0	0	0	3	5	5	13	10	2	0	0	0	38	1774	46.68421
7:00 PM	8:00 PM	0	0	0	1	0	2	4	7	4	2	0	0	0	20	940	47
8:00 PM	9:00 PM	0	0	0	0	1	4	5	2	1	0	0	0	0	13	549	42.23077
9:00 PM	10:00 PM	0	1	0	0	1	1	1	2	0	0	0	0	0	6	228	38
10:00 PM	11:00 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	4	182	45.5
11:00 PM	12:00 AM	0	0	0	1	0	0	1	0	0	0	0	0	0	2	71	35.5
															544	25356	46.61029

Location 5: Bridge Street east of East Frontage Road (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	1	0	2	3	14	15	14	3	3	0	0	55	2630	47.81818
1:00 AM	2:00 AM	0	0	0	0	1	7	12	17	7	2	4	0	0	50	2370	47.4
2:00 AM	3:00 AM	0	0	0	1	0	4	10	5	5	0	1	0	0	26	1178	45.30769
3:00 AM	4:00 AM	0	1	0	0	1	1	7	12	1	1	1	0	0	25	1140	45.6
4:00 AM	5:00 AM	0	0	0	0	1	6	10	8	10	3	0	0	0	38	1779	46.81579
5:00 AM	6:00 AM	0	0	0	0	0	3	8	6	7	2	1	0	0	27	1296	48
6:00 AM	7:00 AM	0	0	0	0	0	3	6	10	7	1	1	0	0	28	1344	48
7:00 AM	8:00 AM	0	0	0	0	0	2	9	11	7	3	0	0	0	32	1536	48
8:00 AM	9:00 AM	1	0	0	0	1	7	14	8	13	1	2	0	0	47	2168	46.12766
9:00 AM	10:00 AM	0	0	0	0	0	5	12	10	6	4	1	0	0	38	1799	47.34211
10:00 AM	11:00 AM	1	0	0	1	0	4	10	10	10	0	0	0	0	36	1630	45.27778
11:00 AM	12:00 PM	0	0	0	0	3	5	5	13	10	2	0	0	0	38	1774	46.68421
12:00 PM	1:00 PM	0	0	0	1	0	2	4	7	4	2	0	0	0	20	940	47
1:00 PM	2:00 PM	0	0	0	0	1	4	5	2	1	0	0	0	0	13	549	42.23077
2:00 PM	3:00 PM	0	1	0	0	1	1	1	2	0	0	0	0	0	6	228	38
3:00 PM	4:00 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	4	182	45.5
4:00 PM	5:00 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	2	71	35.5
5:00 PM	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
6:00 PM	7:00 PM	0	0	0	0	0	0	0	1	1	0	0	0	0	2	101	50.5
7:00 PM	8:00 PM	0	0	3	0	6	17	38	47	32	11	8	0	0	162	7641	47.16667
8:00 PM	9:00 PM	0	1	0	1	2	14	35	31	23	6	3	0	0	116	5393	46.49138
9:00 PM	10:00 PM	1	0	0	0	1	17	41	39	33	9	4	0	0	145	6847	47.22069
10:00 PM	11:00 PM	1	0	0	2	4	15	24	32	25	4	0	0	0	107	4893	45.72897
11:00 PM	12:00 AM	0	1	0	1	1	1	4	4	0	0	0	0	0	12	481	40.08333
															1029	47970	46.61808

Location		Bromley Lane west of West Frontage Road					
#6		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	23	5	18%	14	0	0%
1:00 AM	2:00 AM	10	3	23%	12	5	29%
2:00 AM	3:00 AM	20	0	0%	20	0	0%
3:00 AM	4:00 AM	17	2	11%	17	1	6%
4:00 AM	5:00 AM	37	6	14%	54	6	10%
5:00 AM	6:00 AM	108	22	17%	130	15	10%
6:00 AM	7:00 AM	197	36	15%	259	37	13%
7:00 AM	8:00 AM	320	30	9%	511	40	7%
8:00 AM	9:00 AM	299	34	10%	586	44	7%
9:00 AM	10:00 AM	296	37	11%	275	33	11%
10:00 AM	11:00 AM	313	30	9%	285	28	9%
11:00 AM	12:00 PM	346	33	9%	315	41	12%
12:00 PM	1:00 PM	380	50	12%	386	31	7%
1:00 PM	2:00 PM	376	35	9%	367	41	10%
2:00 PM	3:00 PM	354	41	10%	334	37	10%
3:00 PM	4:00 PM	545	46	8%	413	59	13%
4:00 PM	5:00 PM	553	55	9%	440	55	11%
5:00 PM	6:00 PM	600	49	8%	420	47	10%
6:00 PM	7:00 PM	422	48	10%	353	37	9%
7:00 PM	8:00 PM	352	28	7%	227	29	11%
8:00 PM	9:00 PM	297	22	7%	170	15	8%
9:00 PM	10:00 PM	168	17	9%	110	7	6%
10:00 PM	11:00 PM	88	3	3%	73	1	1%
11:00 PM	12:00 AM	49	5	9%	36	2	5%
		6170	637	9%	5807	611	10%

Location 6: Bromley Lane west of West Frontage Road (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	2	12	8	5	1	0	0	0	0	0	0	28	879	31.39286
1:00 AM	2:00 AM	0	0	1	2	7	2	1	0	0	0	0	0	0	13	429	33
2:00 AM	3:00 AM	0	0	1	5	9	4	1	0	0	0	0	0	0	20	655	32.75
3:00 AM	4:00 AM	0	0	2	6	6	4	1	0	0	0	0	0	0	19	607	31.94737
4:00 AM	5:00 AM	1	0	1	21	12	7	1	0	0	0	0	0	0	43	1326	30.83721
5:00 AM	6:00 AM	1	1	11	56	42	18	1	0	0	0	0	0	0	130	3962	30.47692
6:00 AM	7:00 AM	4	4	39	91	76	17	2	0	0	0	0	0	0	233	6797	29.17167
7:00 AM	8:00 AM	5	12	52	127	109	42	3	0	0	0	0	0	0	350	10340	29.54286
8:00 AM	9:00 AM	4	7	48	129	117	27	1	0	0	0	0	0	0	333	9812	29.46547
9:00 AM	10:00 AM	10	18	56	136	95	19	1	0	0	0	0	0	0	335	9420	28.1194
10:00 AM	11:00 AM	11	13	68	141	85	23	2	0	0	0	0	0	0	343	9621	28.04956
11:00 AM	12:00 PM	28	25	58	153	98	16	2	0	0	0	0	0	0	380	10276	27.04211
12:00 PM	1:00 PM	17	23	105	180	92	12	1	0	0	0	0	0	0	430	11574	26.91628
1:00 PM	2:00 PM	18	20	86	187	88	10	3	0	0	0	0	0	0	412	11167	27.10437
2:00 PM	3:00 PM	30	24	91	149	85	16	0	0	0	0	0	0	0	395	10410	26.35443
3:00 PM	4:00 PM	67	58	166	204	79	16	1	0	0	0	0	0	0	591	14502	24.53807
4:00 PM	5:00 PM	90	67	123	223	89	18	2	0	0	0	0	0	0	612	14886	24.32353
5:00 PM	6:00 PM	107	68	168	216	78	14	1	0	0	0	0	0	0	652	15355	23.55061
6:00 PM	7:00 PM	19	19	110	212	94	15	1	0	0	0	0	0	0	470	12713	27.04894
7:00 PM	8:00 PM	5	21	89	154	86	22	2	1	0	0	0	0	0	380	10595	27.88158
8:00 PM	9:00 PM	4	7	62	147	81	17	1	0	0	0	0	0	0	319	9070	28.4326
9:00 PM	10:00 PM	1	1	29	72	64	17	1	0	0	0	0	0	0	185	5512	29.79459
10:00 PM	11:00 PM	0	0	13	35	34	9	0	0	0	0	0	0	0	91	2743	30.14286
11:00 PM	12:00 AM	0	1	10	17	19	7	0	0	0	0	0	0	0	54	1617	29.94444
															6818	184268	27.02669

Location 6: Bromley Lane west of West Frontage Road (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	5	12	52	127	109	42	3	0	0	0	0	0	0	350	10340	29.54286
1:00 AM	2:00 AM	4	7	48	129	117	27	1	0	0	0	0	0	0	333	9812	29.46547
2:00 AM	3:00 AM	10	18	56	136	95	19	1	0	0	0	0	0	0	335	9420	28.1194
3:00 AM	4:00 AM	11	13	68	141	85	23	2	0	0	0	0	0	0	343	9621	28.04956
4:00 AM	5:00 AM	28	25	58	153	98	16	2	0	0	0	0	0	0	380	10276	27.04211
5:00 AM	6:00 AM	17	23	105	180	92	12	1	0	0	0	0	0	0	430	11574	26.91628
6:00 AM	7:00 AM	18	20	86	187	88	10	3	0	0	0	0	0	0	412	11167	27.10437
7:00 AM	8:00 AM	30	24	91	149	85	16	0	0	0	0	0	0	0	395	10410	26.35443
8:00 AM	9:00 AM	67	58	166	204	79	16	1	0	0	0	0	0	0	591	14502	24.53807
9:00 AM	10:00 AM	90	67	123	223	89	18	2	0	0	0	0	0	0	612	14886	24.32353
10:00 AM	11:00 AM	107	68	168	216	78	14	1	0	0	0	0	0	0	652	15355	23.55061
11:00 AM	12:00 PM	19	19	110	212	94	15	1	0	0	0	0	0	0	470	12713	27.04894
12:00 PM	1:00 PM	5	21	89	154	86	22	2	1	0	0	0	0	0	380	10595	27.88158
1:00 PM	2:00 PM	4	7	62	147	81	17	1	0	0	0	0	0	0	319	9070	28.4326
2:00 PM	3:00 PM	1	1	29	72	64	17	1	0	0	0	0	0	0	185	5512	29.79459
3:00 PM	4:00 PM	0	0	13	35	34	9	0	0	0	0	0	0	0	91	2743	30.14286
4:00 PM	5:00 PM	0	1	10	17	19	7	0	0	0	0	0	0	0	54	1617	29.94444
5:00 PM	6:00 PM	0	0	2	12	8	5	1	0	0	0	0	0	0	28	879	31.39286
6:00 PM	7:00 PM	1	0	5	34	34	17	4	0	0	0	0	0	0	95	3017	31.75789
7:00 PM	8:00 PM	14	24	150	403	344	104	7	0	0	0	0	0	0	1046	30911	29.55163
8:00 PM	9:00 PM	66	79	287	610	370	70	6	0	0	0	0	0	0	1488	40891	27.48051
9:00 PM	10:00 PM	205	169	466	763	341	60	6	0	0	0	0	0	0	2010	50965	25.35572
10:00 PM	11:00 PM	135	115	429	729	339	68	5	1	0	0	0	0	0	1821	47733	26.21252
11:00 PM	12:00 AM	1	2	52	124	117	33	1	0	0	0	0	0	0	330	9872	29.91515
															13150	353881	26.9111

Location		Bromley Lane east of East Frontage Road					
#7		Eastbound			Westbound		
		EB Cars	EB Trucks	EB % Trucks	WB Cars	WB Trucks	WB % Trucks
12:00 AM	1:00 AM	11	1	8%	8	0	0%
1:00 AM	2:00 AM	6	0	0%	2	0	0%
2:00 AM	3:00 AM	2	0	0%	3	0	0%
3:00 AM	4:00 AM	9	1	10%	9	1	10%
4:00 AM	5:00 AM	7	0	0%	26	7	21%
5:00 AM	6:00 AM	25	3	11%	105	21	17%
6:00 AM	7:00 AM	106	5	5%	231	42	15%
7:00 AM	8:00 AM	129	12	9%	288	49	15%
8:00 AM	9:00 AM	128	18	12%	219	28	11%
9:00 AM	10:00 AM	110	12	10%	146	29	17%
10:00 AM	11:00 AM	124	10	7%	137	19	12%
11:00 AM	12:00 PM	126	14	10%	147	36	20%
12:00 PM	1:00 PM	186	10	5%	173	26	13%
1:00 PM	2:00 PM	159	15	9%	129	35	21%
2:00 PM	3:00 PM	151	14	8%	141	18	11%
3:00 PM	4:00 PM	216	22	9%	169	34	17%
4:00 PM	5:00 PM	292	30	9%	197	35	15%
5:00 PM	6:00 PM	312	17	5%	218	30	12%
6:00 PM	7:00 PM	228	14	6%	120	16	12%
7:00 PM	8:00 PM	167	4	2%	86	13	13%
8:00 PM	9:00 PM	145	4	3%	59	8	12%
9:00 PM	10:00 PM	83	7	8%	49	4	8%
10:00 PM	11:00 PM	41	2	5%	28	0	0%
11:00 PM	12:00 AM	18	1	5%	10	1	9%
		2781	216	7%	2700	452	14%

Location 7: Bromley Lane east of East Frontage Road (Eastbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	1	0	3	4	3	0	1	0	0	0	12	516	43
1:00 AM	2:00 AM	0	0	0	0	0	1	2	2	1	0	0	0	0	6	273	45.5
2:00 AM	3:00 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	2	96	48
3:00 AM	4:00 AM	0	0	0	0	0	0	5	3	2	0	0	0	0	10	465	46.5
4:00 AM	5:00 AM	0	0	0	0	1	1	1	2	2	0	0	0	0	7	316	45.14286
5:00 AM	6:00 AM	2	0	0	0	1	6	9	9	2	0	0	0	0	29	1206	41.58621
6:00 AM	7:00 AM	2	0	0	0	6	18	46	27	12	0	0	0	0	111	4812	43.35135
7:00 AM	8:00 AM	6	0	0	0	6	30	64	32	5	1	0	0	0	144	6009	41.72917
8:00 AM	9:00 AM	7	0	0	0	5	44	60	27	6	0	0	0	0	149	6101	40.94631
9:00 AM	10:00 AM	2	0	0	4	7	35	48	23	4	0	0	0	0	123	5073	41.2439
10:00 AM	11:00 AM	0	0	0	0	6	35	53	33	7	0	0	0	0	134	5762	43
11:00 AM	12:00 PM	2	0	0	2	7	55	48	25	4	0	0	0	0	143	5873	41.06993
12:00 PM	1:00 PM	6	0	0	0	16	43	87	40	6	0	1	0	0	199	8264	41.52764
1:00 PM	2:00 PM	5	0	2	0	6	51	65	37	6	2	0	0	0	174	7237	41.59195
2:00 PM	3:00 PM	6	0	0	1	6	47	62	36	7	2	0	0	0	167	6953	41.63473
3:00 PM	4:00 PM	3	0	0	1	11	49	97	65	13	0	0	0	0	239	10263	42.94142
4:00 PM	5:00 PM	10	0	0	0	6	63	149	76	19	1	0	0	0	324	13812	42.62963
5:00 PM	6:00 PM	8	0	0	0	15	33	139	111	21	4	0	0	0	331	14479	43.7432
6:00 PM	7:00 PM	3	0	0	0	13	49	107	54	15	2	0	0	0	243	10425	42.90123
7:00 PM	8:00 PM	1	0	0	0	3	35	63	64	7	1	0	0	0	174	7649	43.95977
8:00 PM	9:00 PM	2	0	0	0	5	45	57	32	8	0	0	0	0	149	6306	42.32215
9:00 PM	10:00 PM	0	0	0	0	5	16	35	26	5	1	2	0	0	90	3975	44.16667
10:00 PM	11:00 PM	0	0	0	0	2	10	13	11	6	1	0	0	0	43	1909	44.39535
11:00 PM	12:00 AM	1	0	0	0	0	4	7	5	2	0	0	0	0	19	809	42.57895
															3022	128583	42.54897

Location 7: Bromley Lane east of East Frontage Road (Westbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	6	0	0	0	6	30	64	32	5	1	0	0	0	144	6009	41.72917
1:00 AM	2:00 AM	7	0	0	0	5	44	60	27	6	0	0	0	0	149	6101	40.94631
2:00 AM	3:00 AM	2	0	0	4	7	35	48	23	4	0	0	0	0	123	5073	41.2439
3:00 AM	4:00 AM	0	0	0	0	6	35	53	33	7	0	0	0	0	134	5762	43
4:00 AM	5:00 AM	2	0	0	2	7	55	48	25	4	0	0	0	0	143	5873	41.06993
5:00 AM	6:00 AM	6	0	0	0	16	43	87	40	6	0	1	0	0	199	8264	41.52764
6:00 AM	7:00 AM	5	0	2	0	6	51	65	37	6	2	0	0	0	174	7237	41.59195
7:00 AM	8:00 AM	6	0	0	1	6	47	62	36	7	2	0	0	0	167	6953	41.63473
8:00 AM	9:00 AM	3	0	0	1	11	49	97	65	13	0	0	0	0	239	10263	42.94142
9:00 AM	10:00 AM	10	0	0	0	6	63	149	76	19	1	0	0	0	324	13812	42.62963
10:00 AM	11:00 AM	8	0	0	0	15	33	139	111	21	4	0	0	0	331	14479	43.7432
11:00 AM	12:00 PM	3	0	0	0	13	49	107	54	15	2	0	0	0	243	10425	42.90123
12:00 PM	1:00 PM	1	0	0	0	3	35	63	64	7	1	0	0	0	174	7649	43.95977
1:00 PM	2:00 PM	2	0	0	0	5	45	57	32	8	0	0	0	0	149	6306	42.32215
2:00 PM	3:00 PM	0	0	0	0	5	16	35	26	5	1	2	0	0	90	3975	44.16667
3:00 PM	4:00 PM	0	0	0	0	2	10	13	11	6	1	0	0	0	43	1909	44.39535
4:00 PM	5:00 PM	1	0	0	0	0	4	7	5	2	0	0	0	0	19	809	42.57895
5:00 PM	6:00 PM	0	0	0	1	0	3	4	3	0	1	0	0	0	12	516	43
6:00 PM	7:00 PM	0	0	0	0	1	2	9	7	6	0	0	0	0	25	1150	46
7:00 PM	8:00 PM	17	0	0	0	18	98	179	95	25	1	0	0	0	433	18128	41.86605
8:00 PM	9:00 PM	10	0	0	6	36	168	236	121	21	0	1	0	0	599	24972	41.68948
9:00 PM	10:00 PM	24	0	2	2	29	210	373	214	45	5	0	0	0	904	38265	42.32854
10:00 PM	11:00 PM	14	0	0	0	36	162	366	261	51	7	0	0	0	897	38859	43.32107
11:00 PM	12:00 AM	1	0	0	0	7	30	55	42	13	2	2	0	0	152	6693	44.03289
															5867	249482	42.52292

Location		West Frontage Road south of Baseline Road					
#8		Northbound			Southbound		
		NB Cars	NB Trucks	NB % Trucks	SB Cars	SB Trucks	SB % Trucks
12:00 AM	1:00 AM	3	0	0%	4	0	0%
1:00 AM	2:00 AM	2	0	0%	3	0	0%
2:00 AM	3:00 AM	5	0	0%	2	0	0%
3:00 AM	4:00 AM	2	0	0%	3	0	0%
4:00 AM	5:00 AM	3	0	0%	6	0	0%
5:00 AM	6:00 AM	17	2	11%	20	2	9%
6:00 AM	7:00 AM	41	1	2%	33	5	13%
7:00 AM	8:00 AM	46	2	4%	78	8	9%
8:00 AM	9:00 AM	52	5	9%	100	9	8%
9:00 AM	10:00 AM	29	7	19%	63	6	9%
10:00 AM	11:00 AM	35	4	10%	53	7	12%
11:00 AM	12:00 PM	56	1	2%	44	3	6%
12:00 PM	1:00 PM	45	2	4%	50	4	7%
1:00 PM	2:00 PM	50	3	6%	56	5	8%
2:00 PM	3:00 PM	52	3	5%	63	9	13%
3:00 PM	4:00 PM	91	1	1%	101	10	9%
4:00 PM	5:00 PM	87	4	4%	68	4	6%
5:00 PM	6:00 PM	81	4	5%	97	19	16%
6:00 PM	7:00 PM	72	2	3%	74	5	6%
7:00 PM	8:00 PM	58	1	2%	53	4	7%
8:00 PM	9:00 PM	49	1	2%	25	2	7%
9:00 PM	10:00 PM	40	1	2%	22	4	15%
10:00 PM	11:00 PM	16	2	11%	9	1	10%
11:00 PM	12:00 AM	5	1	17%	11	0	0%
		937	47	5%	1038	107	9%

Location 8: West Frontage Road south of Baseline Road (Northbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	1	1	0	0	1	0	0	0	0	3	124	41.33333
1:00 AM	2:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	2	66	33
2:00 AM	3:00 AM	0	0	0	0	0	1	3	1	0	0	0	0	0	5	215	43
3:00 AM	4:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	2	91	45.5
4:00 AM	5:00 AM	0	0	0	0	1	0	1	0	1	0	0	0	0	3	129	43
5:00 AM	6:00 AM	1	0	0	0	0	4	8	5	1	0	0	0	0	19	799	42.05263
6:00 AM	7:00 AM	0	0	0	1	3	14	10	13	1	0	0	0	0	42	1766	42.04762
7:00 AM	8:00 AM	0	0	0	0	1	7	19	11	10	0	0	0	0	48	2174	45.29167
8:00 AM	9:00 AM	1	0	0	0	1	13	32	9	1	0	0	0	0	57	2398	42.07018
9:00 AM	10:00 AM	0	0	0	0	4	9	9	12	0	2	0	0	0	36	1553	43.13889
10:00 AM	11:00 AM	2	0	0	0	1	8	16	10	2	0	0	0	0	39	1631	41.82051
11:00 AM	12:00 PM	2	0	0	0	4	7	26	14	2	2	0	0	0	57	2430	42.63158
12:00 PM	1:00 PM	1	0	0	0	2	11	16	14	3	0	0	0	0	47	2013	42.82979
1:00 PM	2:00 PM	3	0	0	0	1	12	22	10	3	0	2	0	0	53	2230	42.07547
2:00 PM	3:00 PM	0	0	0	0	2	9	24	16	4	0	0	0	0	55	2420	44
3:00 PM	4:00 PM	2	0	0	0	6	16	39	21	8	2	0	0	0	94	4051	43.09574
4:00 PM	5:00 PM	3	0	0	1	7	10	39	23	8	0	0	0	0	91	3874	42.57143
5:00 PM	6:00 PM	4	0	0	0	5	21	28	21	6	1	0	0	0	86	3591	41.75581
6:00 PM	7:00 PM	0	0	0	1	4	16	29	21	4	0	0	0	0	75	3235	43.13333
7:00 PM	8:00 PM	0	0	0	1	4	18	21	12	2	0	0	0	0	58	2429	41.87931
8:00 PM	9:00 PM	0	0	0	0	5	11	24	9	1	0	0	0	0	50	2100	42
9:00 PM	10:00 PM	0	0	0	0	6	13	12	8	2	0	0	0	0	41	1698	41.41463
10:00 PM	11:00 PM	0	0	0	0	1	8	5	2	0	0	2	0	0	18	774	43
11:00 PM	12:00 AM	0	0	0	0	0	1	1	4	0	0	0	0	0	6	273	45.5
															987	42064	42.61803

Location 8: West Frontage Road south of Baseline Road (Southbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	1	7	19	11	10	0	0	0	0	48	2174	45.29167
1:00 AM	2:00 AM	1	0	0	0	1	13	32	9	1	0	0	0	0	57	2398	42.07018
2:00 AM	3:00 AM	0	0	0	0	4	9	9	12	0	2	0	0	0	36	1553	43.13889
3:00 AM	4:00 AM	2	0	0	0	1	8	16	10	2	0	0	0	0	39	1631	41.82051
4:00 AM	5:00 AM	2	0	0	0	4	7	26	14	2	2	0	0	0	57	2430	42.63158
5:00 AM	6:00 AM	1	0	0	0	2	11	16	14	3	0	0	0	0	47	2013	42.82979
6:00 AM	7:00 AM	3	0	0	0	1	12	22	10	3	0	2	0	0	53	2230	42.07547
7:00 AM	8:00 AM	0	0	0	0	2	9	24	16	4	0	0	0	0	55	2420	44
8:00 AM	9:00 AM	2	0	0	0	6	16	39	21	8	2	0	0	0	94	4051	43.09574
9:00 AM	10:00 AM	3	0	0	1	7	10	39	23	8	0	0	0	0	91	3874	42.57143
10:00 AM	11:00 AM	4	0	0	0	5	21	28	21	6	1	0	0	0	86	3591	41.75581
11:00 AM	12:00 PM	0	0	0	1	4	16	29	21	4	0	0	0	0	75	3235	43.13333
12:00 PM	1:00 PM	0	0	0	1	4	18	21	12	2	0	0	0	0	58	2429	41.87931
1:00 PM	2:00 PM	0	0	0	0	5	11	24	9	1	0	0	0	0	50	2100	42
2:00 PM	3:00 PM	0	0	0	0	6	13	12	8	2	0	0	0	0	41	1698	41.41463
3:00 PM	4:00 PM	0	0	0	0	1	8	5	2	0	0	2	0	0	18	774	43
4:00 PM	5:00 PM	0	0	0	0	0	1	1	4	0	0	0	0	0	6	273	45.5
5:00 PM	6:00 PM	0	0	0	0	1	1	0	0	1	0	0	0	0	3	124	41.33333
6:00 PM	7:00 PM	0	0	0	1	1	2	5	2	1	0	0	0	0	12	501	41.75
7:00 PM	8:00 PM	2	0	0	1	5	38	69	38	13	0	0	0	0	166	7137	42.99398
8:00 PM	9:00 PM	5	0	0	0	11	35	67	50	7	4	0	0	0	179	7627	42.60894
9:00 PM	10:00 PM	8	0	0	1	16	47	124	70	23	2	2	0	0	293	12575	42.91809
10:00 PM	11:00 PM	4	0	0	2	18	66	102	63	13	1	0	0	0	269	11355	42.2119
11:00 PM	12:00 AM	0	0	0	0	7	22	18	14	2	0	2	0	0	65	2745	42.23077
															1898	80938	42.64384

Location		West Frontage Road south of Bridge Street					
#9		Northbound			Southbound		
		NB Cars	NB Trucks	NB % Trucks	SB Cars	SB Trucks	SB % Trucks
12:00 AM	1:00 AM	4	0	0%	2	0	0%
1:00 AM	2:00 AM	1	1	50%	2	0	0%
2:00 AM	3:00 AM	4	0	0%	0	0	#DIV/0!
3:00 AM	4:00 AM	2	0	0%	6	0	0%
4:00 AM	5:00 AM	1	0	0%	14	0	0%
5:00 AM	6:00 AM	7	3	30%	57	0	0%
6:00 AM	7:00 AM	13	2	13%	85	1	1%
7:00 AM	8:00 AM	64	4	6%	85	1	1%
8:00 AM	9:00 AM	105	4	4%	121	1	1%
9:00 AM	10:00 AM	24	3	11%	60	3	5%
10:00 AM	11:00 AM	27	2	7%	42	1	2%
11:00 AM	12:00 PM	43	3	7%	47	0	0%
12:00 PM	1:00 PM	54	3	5%	55	0	0%
1:00 PM	2:00 PM	49	1	2%	46	0	0%
2:00 PM	3:00 PM	48	5	9%	70	0	0%
3:00 PM	4:00 PM	174	7	4%	91	0	0%
4:00 PM	5:00 PM	129	3	2%	65	0	0%
5:00 PM	6:00 PM	140	4	3%	65	0	0%
6:00 PM	7:00 PM	94	4	4%	52	0	0%
7:00 PM	8:00 PM	76	4	5%	53	0	0%
8:00 PM	9:00 PM	55	2	4%	29	0	0%
9:00 PM	10:00 PM	44	3	6%	19	0	0%
10:00 PM	11:00 PM	17	2	11%	5	1	17%
11:00 PM	12:00 AM	5	0	0%	2	0	0%
		1180	60	5%	1073	8	1%

Location 9: West Frontage Road south of Bridge Street (Northbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	0	1	1	1	1	0	0	0	0	4	182	45.5
1:00 AM	2:00 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	2	86	43
2:00 AM	3:00 AM	0	0	0	0	0	1	0	1	1	0	1	0	0	4	202	50.5
3:00 AM	4:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	116	58
4:00 AM	5:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	53	53
5:00 AM	6:00 AM	1	0	0	0	0	1	2	4	1	0	1	0	0	10	442	44.2
6:00 AM	7:00 AM	1	0	0	0	0	2	3	4	5	0	0	0	0	15	672	44.8
7:00 AM	8:00 AM	3	0	0	3	10	9	9	18	12	2	0	2	0	68	2925	43.01471
8:00 AM	9:00 AM	2	0	0	2	29	22	14	21	14	5	0	0	0	109	4511	41.38532
9:00 AM	10:00 AM	0	0	0	0	1	3	3	7	10	3	0	0	0	27	1316	48.74074
10:00 AM	11:00 AM	1	0	0	1	1	2	9	10	5	0	0	0	0	29	1279	44.10345
11:00 AM	12:00 PM	2	0	0	2	4	5	5	12	13	4	0	0	0	47	2110	44.89362
12:00 PM	1:00 PM	0	0	0	1	4	6	11	19	11	4	1	0	0	57	2651	46.50877
1:00 PM	2:00 PM	2	0	0	0	1	2	15	16	9	3	2	0	0	50	2319	46.38
2:00 PM	3:00 PM	6	0	0	0	2	5	5	17	15	3	2	0	1	56	2515	44.91071
3:00 PM	4:00 PM	5	0	1	9	27	36	31	44	22	5	4	0	0	184	7737	42.04891
4:00 PM	5:00 PM	3	0	0	3	15	21	20	33	27	5	3	0	1	131	5834	44.53435
5:00 PM	6:00 PM	2	0	0	0	14	16	15	44	39	14	2	0	0	146	6852	46.93151
6:00 PM	7:00 PM	1	0	0	2	5	2	10	40	24	11	3	0	0	98	4756	48.53061
7:00 PM	8:00 PM	1	0	0	1	5	9	14	27	21	4	0	0	0	82	3788	46.19512
8:00 PM	9:00 PM	0	0	0	0	1	7	16	18	10	5	0	0	0	57	2671	46.85965
9:00 PM	10:00 PM	1	0	0	0	4	7	11	15	6	3	0	0	0	47	2093	44.53191
10:00 PM	11:00 PM	0	0	0	0	0	2	7	6	3	1	0	0	0	19	882	46.42105
11:00 PM	12:00 AM	0	0	0	0	0	0	1	2	2	0	0	0	0	5	245	49
															1250	56237	44.9896

Location 9: West Frontage Road south of Bridge Street (Southbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	3	0	0	3	10	9	9	18	12	2	0	2	0	68	2925	43.01471
1:00 AM	2:00 AM	2	0	0	2	29	22	14	21	14	5	0	0	0	109	4511	41.38532
2:00 AM	3:00 AM	0	0	0	0	1	3	3	7	10	3	0	0	0	27	1316	48.74074
3:00 AM	4:00 AM	1	0	0	1	1	2	9	10	5	0	0	0	0	29	1279	44.10345
4:00 AM	5:00 AM	2	0	0	2	4	5	5	12	13	4	0	0	0	47	2110	44.89362
5:00 AM	6:00 AM	0	0	0	1	4	6	11	19	11	4	1	0	0	57	2651	46.50877
6:00 AM	7:00 AM	2	0	0	0	1	2	15	16	9	3	2	0	0	50	2319	46.38
7:00 AM	8:00 AM	6	0	0	0	2	5	5	17	15	3	2	0	1	56	2515	44.91071
8:00 AM	9:00 AM	5	0	1	9	27	36	31	44	22	5	4	0	0	184	7737	42.04891
9:00 AM	10:00 AM	3	0	0	3	15	21	20	33	27	5	3	0	1	131	5834	44.53435
10:00 AM	11:00 AM	2	0	0	0	14	16	15	44	39	14	2	0	0	146	6852	46.93151
11:00 AM	12:00 PM	1	0	0	2	5	2	10	40	24	11	3	0	0	98	4756	48.53061
12:00 PM	1:00 PM	1	0	0	1	5	9	14	27	21	4	0	0	0	82	3788	46.19512
1:00 PM	2:00 PM	0	0	0	0	1	7	16	18	10	5	0	0	0	57	2671	46.85965
2:00 PM	3:00 PM	1	0	0	0	4	7	11	15	6	3	0	0	0	47	2093	44.53191
3:00 PM	4:00 PM	0	0	0	0	0	2	7	6	3	1	0	0	0	19	882	46.42105
4:00 PM	5:00 PM	0	0	0	0	0	0	1	2	2	0	0	0	0	5	245	49
5:00 PM	6:00 PM	0	0	0	0	0	1	1	1	1	0	0	0	0	4	182	45.5
6:00 PM	7:00 PM	0	0	0	0	0	1	2	1	2	2	1	0	0	9	457	50.77778
7:00 PM	8:00 PM	7	0	0	5	39	34	28	47	32	7	1	2	0	202	8550	42.32673
8:00 PM	9:00 PM	3	0	0	4	10	16	28	48	39	11	1	0	0	160	7356	45.975
9:00 PM	10:00 PM	16	0	1	12	45	64	71	110	73	16	11	0	2	421	18405	43.71734
10:00 PM	11:00 PM	4	0	0	3	25	34	55	129	94	34	5	0	0	383	18067	47.17232
11:00 PM	12:00 AM	1	0	0	0	4	9	19	23	11	4	0	0	0	71	3220	45.35211
															2462	110721	44.97197

Location		Eastt Frontage Road south of Baseline Road					
#10		Northbound			Southbound		
		NB Cars	NB Trucks	NB % Trucks	SB Cars	SB Trucks	SB % Trucks
12:00 AM	1:00 AM	0	1	100%	0	0	#DIV/0!
1:00 AM	2:00 AM	1	0	0%	1	0	0%
2:00 AM	3:00 AM	0	0	#DIV/0!	0	0	#DIV/0!
3:00 AM	4:00 AM	0	0	#DIV/0!	2	0	0%
4:00 AM	5:00 AM	2	0	0%	1	0	0%
5:00 AM	6:00 AM	5	0	0%	3	0	0%
6:00 AM	7:00 AM	5	5	50%	18	1	5%
7:00 AM	8:00 AM	14	2	13%	53	1	2%
8:00 AM	9:00 AM	30	4	12%	27	0	0%
9:00 AM	10:00 AM	19	6	24%	14	0	0%
10:00 AM	11:00 AM	17	5	23%	17	2	11%
11:00 AM	12:00 PM	19	5	21%	9	2	18%
12:00 PM	1:00 PM	16	4	20%	16	1	6%
1:00 PM	2:00 PM	19	8	30%	9	2	18%
2:00 PM	3:00 PM	19	2	10%	21	0	0%
3:00 PM	4:00 PM	47	6	11%	27	4	13%
4:00 PM	5:00 PM	43	9	17%	14	0	0%
5:00 PM	6:00 PM	37	1	3%	9	0	0%
6:00 PM	7:00 PM	24	4	14%	5	0	0%
7:00 PM	8:00 PM	26	3	10%	2	1	33%
8:00 PM	9:00 PM	16	5	24%	1	0	0%
9:00 PM	10:00 PM	15	2	12%	1	0	0%
10:00 PM	11:00 PM	8	0	0%	0	0	#DIV/0!
11:00 PM	12:00 AM	4	1	20%	1	0	0%
		386	73	16%	251	14	5%

Location 10: East Frontage Road south of Baseline Road (Northbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	38
1:00 AM	2:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	38
2:00 AM	3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
3:00 AM	4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
4:00 AM	5:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	2	76	38
5:00 AM	6:00 AM	0	0	0	0	0	2	1	0	2	0	0	0	0	5	225	45
6:00 AM	7:00 AM	1	0	0	0	2	2	1	0	2	1	0	1	0	10	427	42.7
7:00 AM	8:00 AM	0	0	0	0	1	2	5	4	3	1	0	0	0	16	733	45.8125
8:00 AM	9:00 AM	0	0	0	0	2	11	13	6	2	0	0	0	0	34	1437	42.26471
9:00 AM	10:00 AM	1	1	0	0	0	8	9	5	1	1	0	0	0	26	1070	41.15385
10:00 AM	11:00 AM	3	0	0	1	1	6	7	3	2	0	0	0	0	23	870	37.82609
11:00 AM	12:00 PM	0	0	0	0	1	4	13	6	0	0	0	0	0	24	1032	43
12:00 PM	1:00 PM	2	0	0	0	1	4	5	7	1	1	0	0	0	21	867	41.28571
1:00 PM	2:00 PM	0	1	1	3	3	5	9	4	1	0	0	0	0	27	1046	38.74074
2:00 PM	3:00 PM	0	0	0	0	1	5	11	1	2	1	0	0	0	21	908	43.2381
3:00 PM	4:00 PM	2	0	2	0	1	11	21	12	3	2	0	0	0	54	2271	42.05556
4:00 PM	5:00 PM	1	0	0	0	1	10	20	14	5	1	0	0	0	52	2278	43.80769
5:00 PM	6:00 PM	1	0	1	1	4	6	11	8	6	1	0	0	0	39	1654	42.41026
6:00 PM	7:00 PM	0	0	0	0	2	2	14	6	4	0	0	0	0	28	1244	44.42857
7:00 PM	8:00 PM	0	0	0	1	1	7	18	1	1	0	0	0	0	29	1202	41.44828
8:00 PM	9:00 PM	0	0	1	0	3	7	6	3	1	0	0	0	0	21	843	40.14286
9:00 PM	10:00 PM	0	0	0	0	2	7	5	3	0	0	0	0	0	17	691	40.64706
10:00 PM	11:00 PM	0	0	0	0	0	0	4	2	2	0	0	0	0	8	374	46.75
11:00 PM	12:00 AM	0	0	0	0	0	1	3	1	0	0	0	0	0	5	215	43
															464	19539	42.10991

Location 10: East Frontage Road south of Baseline Road (Southbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	1	2	5	4	3	1	0	0	0	16	733	45.8125
1:00 AM	2:00 AM	0	0	0	0	2	11	13	6	2	0	0	0	0	34	1437	42.26471
2:00 AM	3:00 AM	1	1	0	0	0	8	9	5	1	1	0	0	0	26	1070	41.15385
3:00 AM	4:00 AM	3	0	0	1	1	6	7	3	2	0	0	0	0	23	870	37.82609
4:00 AM	5:00 AM	0	0	0	0	1	4	13	6	0	0	0	0	0	24	1032	43
5:00 AM	6:00 AM	2	0	0	0	1	4	5	7	1	1	0	0	0	21	867	41.28571
6:00 AM	7:00 AM	0	1	1	3	3	5	9	4	1	0	0	0	0	27	1046	38.74074
7:00 AM	8:00 AM	0	0	0	0	1	5	11	1	2	1	0	0	0	21	908	43.2381
8:00 AM	9:00 AM	2	0	2	0	1	11	21	12	3	2	0	0	0	54	2271	42.05556
9:00 AM	10:00 AM	1	0	0	0	1	10	20	14	5	1	0	0	0	52	2278	43.80769
10:00 AM	11:00 AM	1	0	1	1	4	6	11	8	6	1	0	0	0	39	1654	42.41026
11:00 AM	12:00 PM	0	0	0	0	2	2	14	6	4	0	0	0	0	28	1244	44.42857
12:00 PM	1:00 PM	0	0	0	1	1	7	18	1	1	0	0	0	0	29	1202	41.44828
1:00 PM	2:00 PM	0	0	1	0	3	7	6	3	1	0	0	0	0	21	843	40.14286
2:00 PM	3:00 PM	0	0	0	0	2	7	5	3	0	0	0	0	0	17	691	40.64706
3:00 PM	4:00 PM	0	0	0	0	0	0	4	2	2	0	0	0	0	8	374	46.75
4:00 PM	5:00 PM	0	0	0	0	0	1	3	1	0	0	0	0	0	5	215	43
5:00 PM	6:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	38
6:00 PM	7:00 PM	0	0	0	0	1	1	1	0	0	0	0	0	0	3	114	38
7:00 PM	8:00 PM	1	0	0	0	5	17	20	10	9	2	0	1	0	65	2822	43.41538
8:00 PM	9:00 PM	6	1	0	1	3	22	34	21	4	2	0	0	0	94	3839	40.84043
9:00 PM	10:00 PM	3	1	3	3	6	31	61	31	11	4	0	0	0	154	6503	42.22727
10:00 PM	11:00 PM	1	0	2	2	10	22	49	18	12	1	0	0	0	117	4943	42.24786
11:00 PM	12:00 AM	0	0	0	0	2	8	12	6	2	0	0	0	0	30	1280	42.66667
															909	38274	42.10561

Location		Easst Frontage Road south of Bridge Street					
#11		Northbound			Southbound		
		NB Cars	NB Trucks	NB % Trucks	SB Cars	SB Trucks	SB % Trucks
12:00 AM	1:00 AM	1	0	0%	0	0	#DIV/0!
1:00 AM	2:00 AM	4	0	0%	5	0	0%
2:00 AM	3:00 AM	1	0	0%	2	0	0%
3:00 AM	4:00 AM	0	0	#DIV/0!	2	0	0%
4:00 AM	5:00 AM	0	0	#DIV/0!	2	0	0%
5:00 AM	6:00 AM	5	0	0%	6	0	0%
6:00 AM	7:00 AM	18	1	5%	24	0	0%
7:00 AM	8:00 AM	24	4	14%	85	2	2%
8:00 AM	9:00 AM	39	6	13%	33	4	11%
9:00 AM	10:00 AM	30	12	29%	18	1	5%
10:00 AM	11:00 AM	33	3	8%	30	1	3%
11:00 AM	12:00 PM	29	4	12%	21	2	9%
12:00 PM	1:00 PM	29	6	17%	47	1	2%
1:00 PM	2:00 PM	26	5	16%	24	4	14%
2:00 PM	3:00 PM	37	4	10%	26	3	10%
3:00 PM	4:00 PM	35	3	8%	36	9	20%
4:00 PM	5:00 PM	93	1	1%	37	1	3%
5:00 PM	6:00 PM	85	0	0%	15	3	17%
6:00 PM	7:00 PM	30	2	6%	14	0	0%
7:00 PM	8:00 PM	19	2	10%	5	0	0%
8:00 PM	9:00 PM	6	0	0%	6	0	0%
9:00 PM	10:00 PM	10	0	0%	5	1	17%
10:00 PM	11:00 PM	8	0	0%	2	0	0%
11:00 PM	12:00 AM	8	1	11%	5	0	0%
		570	54	9%	450	32	7%

Location 11: East Frontage Road south of Bridge Street (Northbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	33
1:00 AM	2:00 AM	0	0	0	0	0	1	2	0	1	0	0	0	0	4	177	44.25
2:00 AM	3:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	43	43
3:00 AM	4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
4:00 AM	5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#DIV/0!
5:00 AM	6:00 AM	0	0	0	0	0	0	1	4	0	0	0	0	0	5	235	47
6:00 AM	7:00 AM	0	0	0	0	0	1	7	6	5	0	0	0	0	19	892	46.94737
7:00 AM	8:00 AM	1	0	0	0	3	3	7	8	5	1	0	0	0	28	1231	43.96429
8:00 AM	9:00 AM	1	0	0	0	1	18	14	8	3	0	0	0	0	45	1872	41.6
9:00 AM	10:00 AM	0	1	0	3	4	10	13	7	4	0	0	0	0	42	1721	40.97619
10:00 AM	11:00 AM	0	0	0	0	2	10	12	6	6	0	0	0	0	36	1568	43.55556
11:00 AM	12:00 PM	0	0	0	2	0	8	5	16	1	0	1	0	0	33	1459	44.21212
12:00 PM	1:00 PM	0	0	0	1	1	9	10	10	3	1	0	0	0	35	1530	43.71429
1:00 PM	2:00 PM	0	0	0	3	2	9	9	7	1	0	0	0	0	31	1268	40.90323
2:00 PM	3:00 PM	0	0	0	0	4	10	13	9	3	2	0	0	0	41	1778	43.36585
3:00 PM	4:00 PM	0	2	0	1	0	7	13	10	5	0	0	0	0	38	1634	43
4:00 PM	5:00 PM	0	0	0	1	3	14	41	24	10	3	0	0	0	96	4278	44.5625
5:00 PM	6:00 PM	0	0	1	0	0	5	22	40	14	2	1	0	0	85	4000	47.05882
6:00 PM	7:00 PM	0	0	0	0	0	7	6	17	0	2	0	0	0	32	1456	45.5
7:00 PM	8:00 PM	0	0	0	0	2	5	4	8	1	1	0	0	0	21	923	43.95238
8:00 PM	9:00 PM	0	0	0	0	0	1	4	1	0	0	0	0	0	6	258	43
9:00 PM	10:00 PM	0	0	0	0	2	2	4	2	0	0	0	0	0	10	410	41
10:00 PM	11:00 PM	0	0	0	0	2	0	5	1	0	0	0	0	0	8	329	41.125
11:00 PM	12:00 AM	0	0	0	0	0	0	6	1	2	0	0	0	0	9	412	45.77778
															626	27507	43.94089

Location 11: East Frontage Road south of Bridge Street(Southbound)																	
Time		1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total Veh	Total Speed	Est Avg
12:00 AM	1:00 AM	1	0	0	0	3	3	7	8	5	1	0	0	0	28	1231	43.96429
1:00 AM	2:00 AM	1	0	0	0	1	18	14	8	3	0	0	0	0	45	1872	41.6
2:00 AM	3:00 AM	0	1	0	3	4	10	13	7	4	0	0	0	0	42	1721	40.97619
3:00 AM	4:00 AM	0	0	0	0	2	10	12	6	6	0	0	0	0	36	1568	43.55556
4:00 AM	5:00 AM	0	0	0	2	0	8	5	16	1	0	1	0	0	33	1459	44.21212
5:00 AM	6:00 AM	0	0	0	1	1	9	10	10	3	1	0	0	0	35	1530	43.71429
6:00 AM	7:00 AM	0	0	0	3	2	9	9	7	1	0	0	0	0	31	1268	40.90323
7:00 AM	8:00 AM	0	0	0	0	4	10	13	9	3	2	0	0	0	41	1778	43.36585
8:00 AM	9:00 AM	0	2	0	1	0	7	13	10	5	0	0	0	0	38	1634	43
9:00 AM	10:00 AM	0	0	0	1	3	14	41	24	10	3	0	0	0	96	4278	44.5625
10:00 AM	11:00 AM	0	0	1	0	0	5	22	40	14	2	1	0	0	85	4000	47.05882
11:00 AM	12:00 PM	0	0	0	0	0	7	6	17	0	2	0	0	0	32	1456	45.5
12:00 PM	1:00 PM	0	0	0	0	2	5	4	8	1	1	0	0	0	21	923	43.95238
1:00 PM	2:00 PM	0	0	0	0	0	1	4	1	0	0	0	0	0	6	258	43
2:00 PM	3:00 PM	0	0	0	0	2	2	4	2	0	0	0	0	0	10	410	41
3:00 PM	4:00 PM	0	0	0	0	2	0	5	1	0	0	0	0	0	8	329	41.125
4:00 PM	5:00 PM	0	0	0	0	0	0	6	1	2	0	0	0	0	9	412	45.77778
5:00 PM	6:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	33
6:00 PM	7:00 PM	0	0	0	0	0	1	3	0	1	0	0	0	0	5	220	44
7:00 PM	8:00 PM	2	0	0	0	4	22	29	26	13	1	0	0	0	97	4230	43.60825
8:00 PM	9:00 PM	0	1	0	6	7	37	40	39	14	1	1	0	0	146	6278	43
9:00 PM	10:00 PM	0	2	0	5	9	40	76	50	19	5	0	0	0	206	8958	43.48544
10:00 PM	11:00 PM	0	0	1	0	2	18	36	66	15	5	1	0	0	144	6637	46.09028
11:00 PM	12:00 AM	0	0	0	0	4	2	15	4	2	0	0	0	0	27	1151	42.62963
															1222	53634	43.89034

Volume
 Start Date: 4/25/2013
 Start Time: 12:00:00 AM
 Station ID: 1
 Location 1: 176 SB OFF RAMP NO BASELIN

Date	Time	SB
4/25/2013	12:00 AM	4
4/25/2013	12:15 AM	4
4/25/2013	12:30 AM	1
4/25/2013	12:45 AM	2
4/25/2013	01:00 AM	2
4/25/2013	01:15 AM	0
4/25/2013	01:30 AM	1
4/25/2013	01:45 AM	0
4/25/2013	02:00 AM	0
4/25/2013	02:15 AM	3
4/25/2013	02:30 AM	2
4/25/2013	02:45 AM	0
4/25/2013	03:00 AM	2
4/25/2013	03:15 AM	1
4/25/2013	03:30 AM	1
4/25/2013	03:45 AM	4
4/25/2013	04:00 AM	0
4/25/2013	04:15 AM	1
4/25/2013	04:30 AM	14
4/25/2013	04:45 AM	5
4/25/2013	05:00 AM	2
4/25/2013	05:15 AM	8
4/25/2013	05:30 AM	8
4/25/2013	05:45 AM	12
4/25/2013	06:00 AM	16
4/25/2013	06:15 AM	18
4/25/2013	06:30 AM	21
4/25/2013	06:45 AM	25
4/25/2013	07:00 AM	18
4/25/2013	07:15 AM	26
4/25/2013	07:30 AM	28
4/25/2013	07:45 AM	29
4/25/2013	08:00 AM	27
4/25/2013	08:15 AM	26
4/25/2013	08:30 AM	24
4/25/2013	08:45 AM	16
4/25/2013	09:00 AM	20
4/25/2013	09:15 AM	17
4/25/2013	09:30 AM	24
4/25/2013	09:45 AM	12
4/25/2013	10:00 AM	30
4/25/2013	10:15 AM	26
4/25/2013	10:30 AM	7
4/25/2013	10:45 AM	20
4/25/2013	11:00 AM	21
4/25/2013	11:15 AM	24
4/25/2013	11:30 AM	20

101

4/25/2013	11:45 AM	8
4/25/2013	12:00 PM	18
4/25/2013	12:15 PM	22
4/25/2013	12:30 PM	12
4/25/2013	12:45 PM	11
4/25/2013	01:00 PM	13
4/25/2013	01:15 PM	17
4/25/2013	01:30 PM	21
4/25/2013	01:45 PM	29
4/25/2013	02:00 PM	14
4/25/2013	02:15 PM	23
4/25/2013	02:30 PM	17
4/25/2013	02:45 PM	21
4/25/2013	03:00 PM	19
4/25/2013	03:15 PM	26
4/25/2013	03:30 PM	31
4/25/2013	03:45 PM	37
4/25/2013	04:00 PM	34
4/25/2013	04:15 PM	30
4/25/2013	04:30 PM	36
4/25/2013	04:45 PM	32
4/25/2013	05:00 PM	29
4/25/2013	05:15 PM	43
4/25/2013	05:30 PM	55
4/25/2013	05:45 PM	38
4/25/2013	06:00 PM	30
4/25/2013	06:15 PM	25
4/25/2013	06:30 PM	20
4/25/2013	06:45 PM	21
4/25/2013	07:00 PM	20
4/25/2013	07:15 PM	21
4/25/2013	07:30 PM	27
4/25/2013	07:45 PM	16
4/25/2013	08:00 PM	19
4/25/2013	08:15 PM	8
4/25/2013	08:30 PM	5
4/25/2013	08:45 PM	3
4/25/2013	09:00 PM	12
4/25/2013	09:15 PM	8
4/25/2013	09:30 PM	4
4/25/2013	09:45 PM	3
4/25/2013	10:00 PM	2
4/25/2013	10:15 PM	7
4/25/2013	10:30 PM	7
4/25/2013	10:45 PM	3
4/25/2013	11:00 PM	4
4/25/2013	11:15 PM	5
4/25/2013	11:30 PM	10
4/25/2013	11:45 PM	3

165

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 2

Location 1: I-76 SB ON RAMP S/O BASELINI

Date	Time	SB
4/25/2013	12:00 AM	0
4/25/2013	12:15 AM	2
4/25/2013	12:30 AM	0
4/25/2013	12:45 AM	2
4/25/2013	01:00 AM	1
4/25/2013	01:15 AM	2
4/25/2013	01:30 AM	2
4/25/2013	01:45 AM	2
4/25/2013	02:00 AM	2
4/25/2013	02:15 AM	8
4/25/2013	02:30 AM	6
4/25/2013	02:45 AM	4
4/25/2013	03:00 AM	5
4/25/2013	03:15 AM	6
4/25/2013	03:30 AM	13
4/25/2013	03:45 AM	8
4/25/2013	04:00 AM	11
4/25/2013	04:15 AM	18
4/25/2013	04:30 AM	21
4/25/2013	04:45 AM	35
4/25/2013	05:00 AM	50
4/25/2013	05:15 AM	70
4/25/2013	05:30 AM	92
4/25/2013	05:45 AM	77
4/25/2013	06:00 AM	132
4/25/2013	06:15 AM	123
4/25/2013	06:30 AM	140
4/25/2013	06:45 AM	127
4/25/2013	07:00 AM	135
4/25/2013	07:15 AM	134
4/25/2013	07:30 AM	121
4/25/2013	07:45 AM	92
4/25/2013	08:00 AM	98
4/25/2013	08:15 AM	69
4/25/2013	08:30 AM	52
4/25/2013	08:45 AM	59
4/25/2013	09:00 AM	41
4/25/2013	09:15 AM	52
4/25/2013	09:30 AM	40
4/25/2013	09:45 AM	46
4/25/2013	10:00 AM	50
4/25/2013	10:15 AM	39
4/25/2013	10:30 AM	34
4/25/2013	10:45 AM	40
4/25/2013	11:00 AM	45
4/25/2013	11:15 AM	44
4/25/2013	11:30 AM	41

4/25/2013	11:45 AM	44
4/25/2013	12:00 PM	46
4/25/2013	12:15 PM	53
4/25/2013	12:30 PM	44
4/25/2013	12:45 PM	52
4/25/2013	01:00 PM	28
4/25/2013	01:15 PM	44
4/25/2013	01:30 PM	34
4/25/2013	01:45 PM	44
4/25/2013	02:00 PM	48
4/25/2013	02:15 PM	44
4/25/2013	02:30 PM	28
4/25/2013	02:45 PM	40
4/25/2013	03:00 PM	41
4/25/2013	03:15 PM	34
4/25/2013	03:30 PM	40
4/25/2013	03:45 PM	42
4/25/2013	04:00 PM	32
4/25/2013	04:15 PM	49
4/25/2013	04:30 PM	36
4/25/2013	04:45 PM	33
4/25/2013	05:00 PM	44
4/25/2013	05:15 PM	35
4/25/2013	05:30 PM	52
4/25/2013	05:45 PM	36
4/25/2013	06:00 PM	37
4/25/2013	06:15 PM	48
4/25/2013	06:30 PM	28
4/25/2013	06:45 PM	25
4/25/2013	07:00 PM	19
4/25/2013	07:15 PM	27
4/25/2013	07:30 PM	28
4/25/2013	07:45 PM	30
4/25/2013	08:00 PM	28
4/25/2013	08:15 PM	28
4/25/2013	08:30 PM	20
4/25/2013	08:45 PM	15
4/25/2013	09:00 PM	12
4/25/2013	09:15 PM	12
4/25/2013	09:30 PM	12
4/25/2013	09:45 PM	19
4/25/2013	10:00 PM	16
4/25/2013	10:15 PM	10
4/25/2013	10:30 PM	6
4/25/2013	10:45 PM	4
4/25/2013	11:00 PM	4
4/25/2013	11:15 PM	2
4/25/2013	11:30 PM	2
4/25/2013	11:45 PM	4

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 3

Location 1: I-76 NB OFF RAMP S/O BASELIN

Date	Time	NB
4/25/2013	12:00 AM	10
4/25/2013	12:15 AM	8
4/25/2013	12:30 AM	8
4/25/2013	12:45 AM	3
4/25/2013	01:00 AM	8
4/25/2013	01:15 AM	4
4/25/2013	01:30 AM	3
4/25/2013	01:45 AM	8
4/25/2013	02:00 AM	5
4/25/2013	02:15 AM	1
4/25/2013	02:30 AM	2
4/25/2013	02:45 AM	6
4/25/2013	03:00 AM	2
4/25/2013	03:15 AM	4
4/25/2013	03:30 AM	2
4/25/2013	03:45 AM	2
4/25/2013	04:00 AM	1
4/25/2013	04:15 AM	4
4/25/2013	04:30 AM	6
4/25/2013	04:45 AM	6
4/25/2013	05:00 AM	5
4/25/2013	05:15 AM	6
4/25/2013	05:30 AM	4
4/25/2013	05:45 AM	10
4/25/2013	06:00 AM	10
4/25/2013	06:15 AM	18
4/25/2013	06:30 AM	24
4/25/2013	06:45 AM	30
4/25/2013	07:00 AM	17
4/25/2013	07:15 AM	33
4/25/2013	07:30 AM	34
4/25/2013	07:45 AM	30
4/25/2013	08:00 AM	26
4/25/2013	08:15 AM	26
4/25/2013	08:30 AM	18
4/25/2013	08:45 AM	28
4/25/2013	09:00 AM	28
4/25/2013	09:15 AM	30
4/25/2013	09:30 AM	26
4/25/2013	09:45 AM	31
4/25/2013	10:00 AM	28
4/25/2013	10:15 AM	22
4/25/2013	10:30 AM	26
4/25/2013	10:45 AM	22
4/25/2013	11:00 AM	32
4/25/2013	11:15 AM	30
4/25/2013	11:30 AM	28

4/25/2013	11:45 AM	45	
4/25/2013	12:00 PM	38	
4/25/2013	12:15 PM	36	
4/25/2013	12:30 PM	39	
4/25/2013	12:45 PM	35	
4/25/2013	01:00 PM	41	
4/25/2013	01:15 PM	36	
4/25/2013	01:30 PM	46	
4/25/2013	01:45 PM	52	
4/25/2013	02:00 PM	47	
4/25/2013	02:15 PM	44	
4/25/2013	02:30 PM	48	
4/25/2013	02:45 PM	68	
4/25/2013	03:00 PM	65	
4/25/2013	03:15 PM	74	
4/25/2013	03:30 PM	68	
4/25/2013	03:45 PM	96	
4/25/2013	04:00 PM	96	
4/25/2013	04:15 PM	113	
4/25/2013	04:30 PM	90	
4/25/2013	04:45 PM	144	
4/25/2013	05:00 PM	117	
4/25/2013	05:15 PM	138	
4/25/2013	05:30 PM	118	
4/25/2013	05:45 PM	126	499
4/25/2013	06:00 PM	82	
4/25/2013	06:15 PM	79	
4/25/2013	06:30 PM	61	
4/25/2013	06:45 PM	70	
4/25/2013	07:00 PM	63	
4/25/2013	07:15 PM	50	
4/25/2013	07:30 PM	66	
4/25/2013	07:45 PM	58	
4/25/2013	08:00 PM	48	
4/25/2013	08:15 PM	53	
4/25/2013	08:30 PM	48	
4/25/2013	08:45 PM	42	
4/25/2013	09:00 PM	42	
4/25/2013	09:15 PM	33	
4/25/2013	09:30 PM	34	
4/25/2013	09:45 PM	26	
4/25/2013	10:00 PM	21	
4/25/2013	10:15 PM	26	
4/25/2013	10:30 PM	22	
4/25/2013	10:45 PM	18	
4/25/2013	11:00 PM	23	
4/25/2013	11:15 PM	15	
4/25/2013	11:30 PM	10	
4/25/2013	11:45 PM	10	

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 4

Location 1: I-76 NB ON RAMP N/O BASELIN

Date	Time	NB
4/25/2013	12:00 AM	1
4/25/2013	12:15 AM	1
4/25/2013	12:30 AM	4
4/25/2013	12:45 AM	6
4/25/2013	01:00 AM	6
4/25/2013	01:15 AM	0
4/25/2013	01:30 AM	2
4/25/2013	01:45 AM	2
4/25/2013	02:00 AM	2
4/25/2013	02:15 AM	0
4/25/2013	02:30 AM	1
4/25/2013	02:45 AM	1
4/25/2013	03:00 AM	0
4/25/2013	03:15 AM	1
4/25/2013	03:30 AM	3
4/25/2013	03:45 AM	3
4/25/2013	04:00 AM	3
4/25/2013	04:15 AM	6
4/25/2013	04:30 AM	3
4/25/2013	04:45 AM	8
4/25/2013	05:00 AM	15
4/25/2013	05:15 AM	13
4/25/2013	05:30 AM	18
4/25/2013	05:45 AM	12
4/25/2013	06:00 AM	22
4/25/2013	06:15 AM	30
4/25/2013	06:30 AM	33
4/25/2013	06:45 AM	27
4/25/2013	07:00 AM	20
4/25/2013	07:15 AM	24
4/25/2013	07:30 AM	38
4/25/2013	07:45 AM	44
4/25/2013	08:00 AM	14
4/25/2013	08:15 AM	20
4/25/2013	08:30 AM	19
4/25/2013	08:45 AM	13
4/25/2013	09:00 AM	20
4/25/2013	09:15 AM	15
4/25/2013	09:30 AM	14
4/25/2013	09:45 AM	17
4/25/2013	10:00 AM	22
4/25/2013	10:15 AM	27
4/25/2013	10:30 AM	18
4/25/2013	10:45 AM	25
4/25/2013	11:00 AM	26
4/25/2013	11:15 AM	17
4/25/2013	11:30 AM	16

4/25/2013	11:45 AM	16
4/25/2013	12:00 PM	16
4/25/2013	12:15 PM	12
4/25/2013	12:30 PM	28
4/25/2013	12:45 PM	12
4/25/2013	01:00 PM	16
4/25/2013	01:15 PM	11
4/25/2013	01:30 PM	28
4/25/2013	01:45 PM	22
4/25/2013	02:00 PM	19
4/25/2013	02:15 PM	18
4/25/2013	02:30 PM	16
4/25/2013	02:45 PM	24
4/25/2013	03:00 PM	30
4/25/2013	03:15 PM	22
4/25/2013	03:30 PM	42
4/25/2013	03:45 PM	36
4/25/2013	04:00 PM	23
4/25/2013	04:15 PM	33
4/25/2013	04:30 PM	22
4/25/2013	04:45 PM	36
4/25/2013	05:00 PM	31
4/25/2013	05:15 PM	33
4/25/2013	05:30 PM	44
4/25/2013	05:45 PM	26
4/25/2013	06:00 PM	20
4/25/2013	06:15 PM	20
4/25/2013	06:30 PM	24
4/25/2013	06:45 PM	16
4/25/2013	07:00 PM	14
4/25/2013	07:15 PM	13
4/25/2013	07:30 PM	14
4/25/2013	07:45 PM	18
4/25/2013	08:00 PM	11
4/25/2013	08:15 PM	16
4/25/2013	08:30 PM	10
4/25/2013	08:45 PM	14
4/25/2013	09:00 PM	14
4/25/2013	09:15 PM	13
4/25/2013	09:30 PM	9
4/25/2013	09:45 PM	10
4/25/2013	10:00 PM	14
4/25/2013	10:15 PM	8
4/25/2013	10:30 PM	8
4/25/2013	10:45 PM	4
4/25/2013	11:00 PM	5
4/25/2013	11:15 PM	1
4/25/2013	11:30 PM	4
4/25/2013	11:45 PM	0

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 5

Location 1: I-76 SB OFF RAMP N/O BROMLE

Date	Time	SB
4/25/2013	12:00 AM	1
4/25/2013	12:15 AM	1
4/25/2013	12:30 AM	0
4/25/2013	12:45 AM	2
4/25/2013	01:00 AM	2
4/25/2013	01:15 AM	3
4/25/2013	01:30 AM	2
4/25/2013	01:45 AM	1
4/25/2013	02:00 AM	1
4/25/2013	02:15 AM	6
4/25/2013	02:30 AM	3
4/25/2013	02:45 AM	3
4/25/2013	03:00 AM	0
4/25/2013	03:15 AM	1
4/25/2013	03:30 AM	3
4/25/2013	03:45 AM	2
4/25/2013	04:00 AM	2
4/25/2013	04:15 AM	3
4/25/2013	04:30 AM	8
4/25/2013	04:45 AM	10
4/25/2013	05:00 AM	10
4/25/2013	05:15 AM	9
4/25/2013	05:30 AM	10
4/25/2013	05:45 AM	17
4/25/2013	06:00 AM	12
4/25/2013	06:15 AM	26
4/25/2013	06:30 AM	22
4/25/2013	06:45 AM	21
4/25/2013	07:00 AM	15
4/25/2013	07:15 AM	30
4/25/2013	07:30 AM	32
4/25/2013	07:45 AM	36
4/25/2013	08:00 AM	30
4/25/2013	08:15 AM	30
4/25/2013	08:30 AM	22
4/25/2013	08:45 AM	20
4/25/2013	09:00 AM	19
4/25/2013	09:15 AM	24
4/25/2013	09:30 AM	23
4/25/2013	09:45 AM	16
4/25/2013	10:00 AM	25
4/25/2013	10:15 AM	14
4/25/2013	10:30 AM	12
4/25/2013	10:45 AM	27
4/25/2013	11:00 AM	33
4/25/2013	11:15 AM	18
4/25/2013	11:30 AM	19

4/25/2013	11:45 AM	28
4/25/2013	12:00 PM	22
4/25/2013	12:15 PM	23
4/25/2013	12:30 PM	30
4/25/2013	12:45 PM	28
4/25/2013	01:00 PM	26
4/25/2013	01:15 PM	28
4/25/2013	01:30 PM	20
4/25/2013	01:45 PM	16
4/25/2013	02:00 PM	23
4/25/2013	02:15 PM	22
4/25/2013	02:30 PM	23
4/25/2013	02:45 PM	24
4/25/2013	03:00 PM	25
4/25/2013	03:15 PM	12
4/25/2013	03:30 PM	26
4/25/2013	03:45 PM	19
4/25/2013	04:00 PM	24
4/25/2013	04:15 PM	21
4/25/2013	04:30 PM	28
4/25/2013	04:45 PM	20
4/25/2013	05:00 PM	22
4/25/2013	05:15 PM	22
4/25/2013	05:30 PM	19
4/25/2013	05:45 PM	28
4/25/2013	06:00 PM	22
4/25/2013	06:15 PM	25
4/25/2013	06:30 PM	18
4/25/2013	06:45 PM	19
4/25/2013	07:00 PM	14
4/25/2013	07:15 PM	24
4/25/2013	07:30 PM	17
4/25/2013	07:45 PM	23
4/25/2013	08:00 PM	17
4/25/2013	08:15 PM	9
4/25/2013	08:30 PM	8
4/25/2013	08:45 PM	4
4/25/2013	09:00 PM	1
4/25/2013	09:15 PM	11
4/25/2013	09:30 PM	7
4/25/2013	09:45 PM	4
4/25/2013	10:00 PM	4
4/25/2013	10:15 PM	6
4/25/2013	10:30 PM	6
4/25/2013	10:45 PM	3
4/25/2013	11:00 PM	4
4/25/2013	11:15 PM	4
4/25/2013	11:30 PM	4
4/25/2013	11:45 PM	4

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 6

Location 1: I-76 SB ON RAMPS S/O BROMLI

Date	Time	SB
4/25/2013	12:00 AM	9
4/25/2013	12:15 AM	10
4/25/2013	12:30 AM	2
4/25/2013	12:45 AM	3
4/25/2013	01:00 AM	0
4/25/2013	01:15 AM	1
4/25/2013	01:30 AM	4
4/25/2013	01:45 AM	6
4/25/2013	02:00 AM	4
4/25/2013	02:15 AM	8
4/25/2013	02:30 AM	7
4/25/2013	02:45 AM	8
4/25/2013	03:00 AM	8
4/25/2013	03:15 AM	10
4/25/2013	03:30 AM	9
4/25/2013	03:45 AM	13
4/25/2013	04:00 AM	14
4/25/2013	04:15 AM	26
4/25/2013	04:30 AM	28
4/25/2013	04:45 AM	39
4/25/2013	05:00 AM	68
4/25/2013	05:15 AM	92
4/25/2013	05:30 AM	111
4/25/2013	05:45 AM	126
4/25/2013	06:00 AM	160
4/25/2013	06:15 AM	202
4/25/2013	06:30 AM	192
4/25/2013	06:45 AM	176
4/25/2013	07:00 AM	192
4/25/2013	07:15 AM	174
4/25/2013	07:30 AM	172
4/25/2013	07:45 AM	164 702
4/25/2013	08:00 AM	156
4/25/2013	08:15 AM	150
4/25/2013	08:30 AM	108
4/25/2013	08:45 AM	102
4/25/2013	09:00 AM	78
4/25/2013	09:15 AM	97
4/25/2013	09:30 AM	106
4/25/2013	09:45 AM	86
4/25/2013	10:00 AM	91
4/25/2013	10:15 AM	92
4/25/2013	10:30 AM	68
4/25/2013	10:45 AM	84
4/25/2013	11:00 AM	74
4/25/2013	11:15 AM	74
4/25/2013	11:30 AM	81

4/25/2013	11:45 AM	92	
4/25/2013	12:00 PM	90	
4/25/2013	12:15 PM	81	
4/25/2013	12:30 PM	76	
4/25/2013	12:45 PM	62	
4/25/2013	01:00 PM	74	
4/25/2013	01:15 PM	70	
4/25/2013	01:30 PM	70	
4/25/2013	01:45 PM	64	
4/25/2013	02:00 PM	80	
4/25/2013	02:15 PM	78	
4/25/2013	02:30 PM	86	
4/25/2013	02:45 PM	84	
4/25/2013	03:00 PM	82	
4/25/2013	03:15 PM	93	
4/25/2013	03:30 PM	124	
4/25/2013	03:45 PM	98	
4/25/2013	04:00 PM	102	
4/25/2013	04:15 PM	94	
4/25/2013	04:30 PM	112	
4/25/2013	04:45 PM	119	
4/25/2013	05:00 PM	149	
4/25/2013	05:15 PM	94	
4/25/2013	05:30 PM	104	
4/25/2013	05:45 PM	94	441
4/25/2013	06:00 PM	62	
4/25/2013	06:15 PM	76	
4/25/2013	06:30 PM	50	
4/25/2013	06:45 PM	42	
4/25/2013	07:00 PM	55	
4/25/2013	07:15 PM	38	
4/25/2013	07:30 PM	58	
4/25/2013	07:45 PM	34	
4/25/2013	08:00 PM	48	
4/25/2013	08:15 PM	37	
4/25/2013	08:30 PM	30	
4/25/2013	08:45 PM	28	
4/25/2013	09:00 PM	45	
4/25/2013	09:15 PM	24	
4/25/2013	09:30 PM	30	
4/25/2013	09:45 PM	14	
4/25/2013	10:00 PM	31	
4/25/2013	10:15 PM	14	
4/25/2013	10:30 PM	9	
4/25/2013	10:45 PM	12	
4/25/2013	11:00 PM	6	
4/25/2013	11:15 PM	3	
4/25/2013	11:30 PM	10	
4/25/2013	11:45 PM	12	

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 7

Location 1: I-76 NB OFF RAMP S/O BROMLE

Date	Time	NB
4/25/2013	12:00 AM	7
4/25/2013	12:15 AM	7
4/25/2013	12:30 AM	7
4/25/2013	12:45 AM	3
4/25/2013	01:00 AM	4
4/25/2013	01:15 AM	5
4/25/2013	01:30 AM	1
4/25/2013	01:45 AM	8
4/25/2013	02:00 AM	3
4/25/2013	02:15 AM	11
4/25/2013	02:30 AM	6
4/25/2013	02:45 AM	10
4/25/2013	03:00 AM	5
4/25/2013	03:15 AM	3
4/25/2013	03:30 AM	5
4/25/2013	03:45 AM	6
4/25/2013	04:00 AM	8
4/25/2013	04:15 AM	9
4/25/2013	04:30 AM	1
4/25/2013	04:45 AM	9
4/25/2013	05:00 AM	8
4/25/2013	05:15 AM	13
4/25/2013	05:30 AM	12
4/25/2013	05:45 AM	22
4/25/2013	06:00 AM	25
4/25/2013	06:15 AM	33
4/25/2013	06:30 AM	62
4/25/2013	06:45 AM	74
4/25/2013	07:00 AM	52
4/25/2013	07:15 AM	76
4/25/2013	07:30 AM	115
4/25/2013	07:45 AM	131
4/25/2013	08:00 AM	114
4/25/2013	08:15 AM	106
4/25/2013	08:30 AM	74
4/25/2013	08:45 AM	83
4/25/2013	09:00 AM	50
4/25/2013	09:15 AM	62
4/25/2013	09:30 AM	71
4/25/2013	09:45 AM	64
4/25/2013	10:00 AM	58
4/25/2013	10:15 AM	55
4/25/2013	10:30 AM	62
4/25/2013	10:45 AM	61
4/25/2013	11:00 AM	48
4/25/2013	11:15 AM	72
4/25/2013	11:30 AM	68

4/25/2013	11:45 AM	51
4/25/2013	12:00 PM	52
4/25/2013	12:15 PM	69
4/25/2013	12:30 PM	90
4/25/2013	12:45 PM	92
4/25/2013	01:00 PM	86
4/25/2013	01:15 PM	90
4/25/2013	01:30 PM	70
4/25/2013	01:45 PM	66
4/25/2013	02:00 PM	68
4/25/2013	02:15 PM	70
4/25/2013	02:30 PM	90
4/25/2013	02:45 PM	98
4/25/2013	03:00 PM	120
4/25/2013	03:15 PM	130
4/25/2013	03:30 PM	118
4/25/2013	03:45 PM	150
4/25/2013	04:00 PM	156
4/25/2013	04:15 PM	126
4/25/2013	04:30 PM	177
4/25/2013	04:45 PM	162
4/25/2013	05:00 PM	164
4/25/2013	05:15 PM	175
4/25/2013	05:30 PM	140
4/25/2013	05:45 PM	172
4/25/2013	06:00 PM	130
4/25/2013	06:15 PM	122
4/25/2013	06:30 PM	119
4/25/2013	06:45 PM	100
4/25/2013	07:00 PM	83
4/25/2013	07:15 PM	74
4/25/2013	07:30 PM	70
4/25/2013	07:45 PM	55
4/25/2013	08:00 PM	60
4/25/2013	08:15 PM	60
4/25/2013	08:30 PM	49
4/25/2013	08:45 PM	64
4/25/2013	09:00 PM	50
4/25/2013	09:15 PM	50
4/25/2013	09:30 PM	39
4/25/2013	09:45 PM	44
4/25/2013	10:00 PM	36
4/25/2013	10:15 PM	28
4/25/2013	10:30 PM	28
4/25/2013	10:45 PM	22
4/25/2013	11:00 PM	20
4/25/2013	11:15 PM	24
4/25/2013	11:30 PM	9
4/25/2013	11:45 PM	10

Volume

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 8

Location 1: I-76 NB ON RAMP N/O BROMLE

Date	Time	NB
4/25/2013	12:00 AM	8
4/25/2013	12:15 AM	0
4/25/2013	12:30 AM	0
4/25/2013	12:45 AM	2
4/25/2013	01:00 AM	0
4/25/2013	01:15 AM	0
4/25/2013	01:30 AM	1
4/25/2013	01:45 AM	2
4/25/2013	02:00 AM	0
4/25/2013	02:15 AM	1
4/25/2013	02:30 AM	1
4/25/2013	02:45 AM	1
4/25/2013	03:00 AM	2
4/25/2013	03:15 AM	2
4/25/2013	03:30 AM	3
4/25/2013	03:45 AM	2
4/25/2013	04:00 AM	0
4/25/2013	04:15 AM	4
4/25/2013	04:30 AM	4
4/25/2013	04:45 AM	10
4/25/2013	05:00 AM	10
4/25/2013	05:15 AM	11
4/25/2013	05:30 AM	8
4/25/2013	05:45 AM	4
4/25/2013	06:00 AM	16
4/25/2013	06:15 AM	8
4/25/2013	06:30 AM	10
4/25/2013	06:45 AM	20
4/25/2013	07:00 AM	15
4/25/2013	07:15 AM	16
4/25/2013	07:30 AM	13
4/25/2013	07:45 AM	19
4/25/2013	08:00 AM	14
4/25/2013	08:15 AM	9
4/25/2013	08:30 AM	23
4/25/2013	08:45 AM	14
4/25/2013	09:00 AM	10
4/25/2013	09:15 AM	16
4/25/2013	09:30 AM	19
4/25/2013	09:45 AM	23
4/25/2013	10:00 AM	10
4/25/2013	10:15 AM	16
4/25/2013	10:30 AM	17
4/25/2013	10:45 AM	24
4/25/2013	11:00 AM	18
4/25/2013	11:15 AM	26
4/25/2013	11:30 AM	20

4/25/2013	11:45 AM	32
4/25/2013	12:00 PM	26
4/25/2013	12:15 PM	20
4/25/2013	12:30 PM	32
4/25/2013	12:45 PM	24
4/25/2013	01:00 PM	27
4/25/2013	01:15 PM	20
4/25/2013	01:30 PM	24
4/25/2013	01:45 PM	27
4/25/2013	02:00 PM	24
4/25/2013	02:15 PM	38
4/25/2013	02:30 PM	28
4/25/2013	02:45 PM	30
4/25/2013	03:00 PM	38
4/25/2013	03:15 PM	46
4/25/2013	03:30 PM	28
4/25/2013	03:45 PM	34
4/25/2013	04:00 PM	40
4/25/2013	04:15 PM	51
4/25/2013	04:30 PM	34
4/25/2013	04:45 PM	40
4/25/2013	05:00 PM	49
4/25/2013	05:15 PM	34
4/25/2013	05:30 PM	40
4/25/2013	05:45 PM	39
4/25/2013	06:00 PM	45
4/25/2013	06:15 PM	36
4/25/2013	06:30 PM	28
4/25/2013	06:45 PM	28
4/25/2013	07:00 PM	25
4/25/2013	07:15 PM	36
4/25/2013	07:30 PM	29
4/25/2013	07:45 PM	22
4/25/2013	08:00 PM	14
4/25/2013	08:15 PM	17
4/25/2013	08:30 PM	18
4/25/2013	08:45 PM	17
4/25/2013	09:00 PM	16
4/25/2013	09:15 PM	14
4/25/2013	09:30 PM	20
4/25/2013	09:45 PM	11
4/25/2013	10:00 PM	7
4/25/2013	10:15 PM	13
4/25/2013	10:30 PM	8
4/25/2013	10:45 PM	2
4/25/2013	11:00 PM	6
4/25/2013	11:15 PM	6
4/25/2013	11:30 PM	7
4/25/2013	11:45 PM	1

EB

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 9

Location 1: I-76 E/O BASELINE

Date	Time	SMALL	MEDIUM	LARGE
4/25/2013	12:00 AM	31	4	2
4/25/2013	12:15 AM	19	2	1
4/25/2013	12:30 AM	46	4	3
4/25/2013	12:45 AM	29	3	2
4/25/2013	01:00 AM	36	4	2
4/25/2013	01:15 AM	16	2	1
4/25/2013	01:30 AM	22	2	1
4/25/2013	01:45 AM	14	2	1
4/25/2013	02:00 AM	20	2	1
4/25/2013	02:15 AM	22	3	1
4/25/2013	02:30 AM	16	2	1
4/25/2013	02:45 AM	25	3	1
4/25/2013	03:00 AM	23	3	1
4/25/2013	03:15 AM	27	3	2
4/25/2013	03:30 AM	29	3	2
4/25/2013	03:45 AM	22	3	1
4/25/2013	04:00 AM	41	4	2
4/25/2013	04:15 AM	31	4	2
4/25/2013	04:30 AM	40	4	2
4/25/2013	04:45 AM	44	4	3
4/25/2013	05:00 AM	72	7	4
4/25/2013	05:15 AM	93	9	5
4/25/2013	05:30 AM	96	10	6
4/25/2013	05:45 AM	80	8	5
4/25/2013	06:00 AM	115	12	7
4/25/2013	06:15 AM	142	14	8
4/25/2013	06:30 AM	137	13	8
4/25/2013	06:45 AM	130	13	7
4/25/2013	07:00 AM	139	13	8
4/25/2013	07:15 AM	139	14	8
4/25/2013	07:30 AM	153	15	9
4/25/2013	07:45 AM	145	14	8
4/25/2013	08:00 AM	145	14	8
4/25/2013	08:15 AM	142	14	8
4/25/2013	08:30 AM	136	13	8
4/25/2013	08:45 AM	128	13	7
4/25/2013	09:00 AM	134	13	8
4/25/2013	09:15 AM	126	13	7
4/25/2013	09:30 AM	148	15	9
4/25/2013	09:45 AM	143	14	8
4/25/2013	10:00 AM	145	14	8
4/25/2013	10:15 AM	156	15	9
4/25/2013	10:30 AM	136	13	8
4/25/2013	10:45 AM	164	16	9
4/25/2013	11:00 AM	155	15	9
4/25/2013	11:15 AM	126	13	7
4/25/2013	11:30 AM	117	12	7

4/25/2013 11:45 AM	115	12	7
4/25/2013 12:00 PM	132	13	8
4/25/2013 12:15 PM	113	12	6
4/25/2013 12:30 PM	123	13	7
4/25/2013 12:45 PM	126	13	7
4/25/2013 01:00 PM	110	11	6
4/25/2013 01:15 PM	142	14	8
4/25/2013 01:30 PM	126	13	7
4/25/2013 01:45 PM	136	13	8
4/25/2013 02:00 PM	132	13	8
4/25/2013 02:15 PM	175	17	10
4/25/2013 02:30 PM	133	13	8
4/25/2013 02:45 PM	139	13	8
4/25/2013 03:00 PM	148	15	8
4/25/2013 03:15 PM	151	15	9
4/25/2013 03:30 PM	175	18	10
4/25/2013 03:45 PM	166	16	9
4/25/2013 04:00 PM	174	17	10
4/25/2013 04:15 PM	181	18	10
4/25/2013 04:30 PM	170	17	10
4/25/2013 04:45 PM	181	18	10
4/25/2013 05:00 PM	153	15	9
4/25/2013 05:15 PM	160	16	9
4/25/2013 05:30 PM	148	15	8
4/25/2013 05:45 PM	152	15	9
4/25/2013 06:00 PM	155	15	9
4/25/2013 06:15 PM	115	12	7
4/25/2013 06:30 PM	132	13	8
4/25/2013 06:45 PM	85	9	5
4/25/2013 07:00 PM	103	10	6
4/25/2013 07:15 PM	87	9	5
4/25/2013 07:30 PM	92	9	5
4/25/2013 07:45 PM	84	8	5
4/25/2013 08:00 PM	76	7	4
4/25/2013 08:15 PM	58	6	3
4/25/2013 08:30 PM	60	6	3
4/25/2013 08:45 PM	74	7	4
4/25/2013 09:00 PM	65	6	4
4/25/2013 09:15 PM	67	7	4
4/25/2013 09:30 PM	61	6	4
4/25/2013 09:45 PM	36	4	2
4/25/2013 10:00 PM	49	4	3
4/25/2013 10:15 PM	65	6	4
4/25/2013 10:30 PM	41	4	2
4/25/2013 10:45 PM	25	3	1
4/25/2013 11:00 PM	37	4	2
4/25/2013 11:15 PM	30	3	2
4/25/2013 11:30 PM	40	4	2
4/25/2013 11:45 PM	22	3	1

709

WB

Start Date: 4/25/2013

Start Time: 12:00:00 AM

Station ID: 9.5

Location 1: I-76 E/O BASELINE

Date	Time	SMALL	MEDIUM	LARGE
4/25/2013	12:00 AM	29	4	2
4/25/2013	12:15 AM	24	3	2
4/25/2013	12:30 AM	14	2	1
4/25/2013	12:45 AM	13	2	1
4/25/2013	01:00 AM	30	4	2
4/25/2013	01:15 AM	20	3	1
4/25/2013	01:30 AM	24	3	2
4/25/2013	01:45 AM	28	4	2
4/25/2013	02:00 AM	16	2	1
4/25/2013	02:15 AM	24	3	2
4/25/2013	02:30 AM	29	4	2
4/25/2013	02:45 AM	25	4	2
4/25/2013	03:00 AM	32	5	2
4/25/2013	03:15 AM	17	2	1
4/25/2013	03:30 AM	25	4	2
4/25/2013	03:45 AM	40	6	3
4/25/2013	04:00 AM	67	10	5
4/25/2013	04:15 AM	42	6	3
4/25/2013	04:30 AM	55	8	4
4/25/2013	04:45 AM	55	8	4
4/25/2013	05:00 AM	59	8	4
4/25/2013	05:15 AM	86	12	6
4/25/2013	05:30 AM	114	16	8
4/25/2013	05:45 AM	146	21	10
4/25/2013	06:00 AM	132	19	9
4/25/2013	06:15 AM	129	19	9
4/25/2013	06:30 AM	166	24	12
4/25/2013	06:45 AM	134	19	10
4/25/2013	07:00 AM	128	18	9
4/25/2013	07:15 AM	155	22	11
4/25/2013	07:30 AM	144	21	10
4/25/2013	07:45 AM	156	23	11
4/25/2013	08:00 AM	150	22	11
4/25/2013	08:15 AM	133	19	9
4/25/2013	08:30 AM	146	21	10
4/25/2013	08:45 AM	132	19	9
4/25/2013	09:00 AM	158	23	11
4/25/2013	09:15 AM	126	18	9
4/25/2013	09:30 AM	138	20	10
4/25/2013	09:45 AM	139	20	10
4/25/2013	10:00 AM	155	22	11
4/25/2013	10:15 AM	126	18	9
4/25/2013	10:30 AM	130	19	9
4/25/2013	10:45 AM	139	20	10
4/25/2013	11:00 AM	124	18	9
4/25/2013	11:15 AM	136	20	10
4/25/2013	11:30 AM	131	19	9

4/25/2013 11:45 AM	124	18	9
4/25/2013 12:00 PM	133	19	9
4/25/2013 12:15 PM	121	17	9
4/25/2013 12:30 PM	135	19	10
4/25/2013 12:45 PM	109	16	8
4/25/2013 01:00 PM	139	20	10
4/25/2013 01:15 PM	144	21	10
4/25/2013 01:30 PM	153	22	11
4/25/2013 01:45 PM	124	18	9
4/25/2013 02:00 PM	144	21	10
4/25/2013 02:15 PM	132	19	9
4/25/2013 02:30 PM	129	19	9
4/25/2013 02:45 PM	138	20	10
4/25/2013 03:00 PM	129	19	9
4/25/2013 03:15 PM	114	16	8
4/25/2013 03:30 PM	155	22	11
4/25/2013 03:45 PM	144	21	10
4/25/2013 04:00 PM	170	24	12
4/25/2013 04:15 PM	161	23	12
4/25/2013 04:30 PM	152	22	11
4/25/2013 04:45 PM	175	25	12
4/25/2013 05:00 PM	165	24	12
4/25/2013 05:15 PM	197	28	14
4/25/2013 05:30 PM	187	27	13
4/25/2013 05:45 PM	150	22	11
4/25/2013 06:00 PM	151	22	11
4/25/2013 06:15 PM	119	17	9
4/25/2013 06:30 PM	114	16	8
4/25/2013 06:45 PM	99	14	7
4/25/2013 07:00 PM	103	15	7
4/25/2013 07:15 PM	121	17	9
4/25/2013 07:30 PM	89	13	6
4/25/2013 07:45 PM	97	14	7
4/25/2013 08:00 PM	71	10	5
4/25/2013 08:15 PM	66	9	5
4/25/2013 08:30 PM	57	8	4
4/25/2013 08:45 PM	49	7	3
4/25/2013 09:00 PM	55	8	4
4/25/2013 09:15 PM	71	10	5
4/25/2013 09:30 PM	57	8	4
4/25/2013 09:45 PM	45	7	3
4/25/2013 10:00 PM	59	8	4
4/25/2013 10:15 PM	45	7	3
4/25/2013 10:30 PM	46	7	3
4/25/2013 10:45 PM	43	6	3
4/25/2013 11:00 PM	32	5	2
4/25/2013 11:15 PM	46	7	3
4/25/2013 11:30 PM	45	7	3
4/25/2013 11:45 PM	40	6	3

850

I-76 & Bridge Street INTERCHANGE



C.2 – Peak-Hour Turning Movements

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	TOWER RD - PRARIE CENTER Southbound				BROMLEY LN Westbound				TOWER RD - PRARIE CENTER Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	1	1	0	0	66	5	0	2	0	9	0	11	64	0	0
07:15 AM	0	0	0	0	0	47	8	0	10	0	9	0	26	84	0	0
07:30 AM	0	1	0	0	0	76	11	0	15	0	8	0	23	111	0	0
07:45 AM	0	0	0	0	0	84	21	0	24	0	13	0	40	141	1	0
Peak Hour	0	2	1	0	0	273	45	0	51	0	39	0	100	400	1	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	TOWER RD - PRARIE CENTER Southbound				BROMLEY LN Westbound				TOWER RD - PRARIE CENTER Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	1	0	0	155	22	0	14	2	37	0	13	98	0	0
05:15 PM	0	1	0	0	1	87	13	0	21	0	29	0	14	107	2	0
05:30 PM	0	0	1	0	0	102	17	0	26	0	34	1	21	99	2	0
05:45 PM	1	1	0	0	0	93	11	0	22	0	35	0	17	89	1	0
Peak Hour	1	2	2	0	1	437	63	0	83	2	135	1	65	393	5	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	KMART ACCESS Southbound				BROMLEY LN Westbound				KMART ACCESS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	1	0	2	0	4	67	0	0	0	0	0	0	0	59	3	0
07:15 AM	2	0	0	0	3	53	0	0	0	0	0	0	0	89	5	0
07:30 AM	1	0	0	0	1	75	0	0	0	0	0	0	0	122	0	0
07:45 AM	0	0	1	0	2	102	0	0	0	0	0	0	0	172	2	0
Peak Hour	4	0	3	0	10	297	0	0	0	0	0	0	0	442	10	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	KMART ACCESS Southbound				BROMLEY LN Westbound				KMART ACCESS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	1	0	0	171	0	0	0	0	0	0	0	122	1	0
05:15 PM	0	0	0	0	0	108	0	0	0	0	0	0	0	122	0	0
05:30 PM	1	0	0	0	1	119	0	0	0	0	0	0	0	116	0	0
05:45 PM	0	0	2	0	1	104	0	0	0	0	0	0	0	105	1	0
Peak Hour	1	0	3	0	2	502	0	0	0	0	0	0	0	465	2	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	JUDICIAL CENTER DR Southbound				BROMLEY LN Westbound				JUDICIAL CENTER DR Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	0	70	7	0	0	0	0	0	6	54	0	0
07:15 AM	0	0	0	0	0	53	19	0	2	0	1	0	14	70	0	0
07:30 AM	0	0	0	0	0	74	36	0	3	0	4	0	37	77	0	0
07:45 AM	0	0	0	0	0	104	60	0	4	0	2	0	76	102	0	0
Peak Hour	0	0	0	0	0	301	122	0	9	0	7	0	133	303	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	JUDICIAL CENTER DR Southbound				BROMLEY LN Westbound				JUDICIAL CENTER DR Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	111	3	0	53	0	69	0	3	124	0	0
05:15 PM	0	0	0	0	0	77	8	0	34	0	27	1	6	120	0	0
05:30 PM	0	0	0	0	0	99	4	0	15	0	19	0	5	109	0	0
05:45 PM	0	0	0	0	0	100	2	0	7	0	6	0	10	95	0	0
Peak Hour	0	0	0	0	0	387	17	0	109	0	121	1	24	448	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	LOWE'S ACCESS Southbound				BROMLEY LN Westbound				LOWE'S ACCESS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	0	69	37	0	20	0	8	0	1	54	0	0
07:15 AM	0	0	0	0	0	73	21	0	22	0	7	0	1	65	0	0
07:30 AM	0	0	0	0	0	124	27	0	24	0	7	0	8	69	0	0
07:45 AM	0	0	0	0	0	175	35	0	20	0	6	0	10	77	0	0
Peak Hour	0	0	0	0	0	441	120	0	86	0	28	0	20	265	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	LOWE'S ACCESS Southbound				BROMLEY LN Westbound				LOWE'S ACCESS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	86	36	0	46	0	26	0	12	190	0	0
05:15 PM	0	0	0	0	0	66	43	0	37	0	19	0	9	149	0	0
05:30 PM	0	0	0	0	0	97	43	0	30	0	13	0	14	111	0	0
05:45 PM	0	0	0	0	0	81	46	0	58	0	23	0	10	101	0	0
Peak Hour	0	0	0	0	0	330	168	0	171	0	81	0	45	551	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WEST FRONTAGE RD Southbound				BROMLEY LN Westbound				WEST FRONTAGE RD Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	41	4	105	0	23	65	2	1	1	4	0	0	0	70	2	0
07:15 AM	25	7	94	0	22	64	1	0	2	1	0	0	1	67	19	0
07:30 AM	37	5	104	0	54	99	2	0	4	6	1	0	3	68	18	0
07:45 AM	68	9	109	0	46	135	2	0	1	3	1	0	1	92	30	0
Peak Hour	171	25	412	0	145	363	7	1	8	14	2	0	5	297	69	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WEST FRONTAGE RD Southbound				BROMLEY LN Westbound				WEST FRONTAGE RD Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	48	12	31	0	86	67	3	0	8	22	2	0	0	145	70	0
05:15 PM	43	17	39	0	90	67	2	0	6	13	2	0	0	135	51	0
05:30 PM	41	18	30	0	101	94	2	0	8	20	2	0	0	106	46	0
05:45 PM	47	20	32	0	108	77	1	0	5	20	1	0	0	104	59	0
Peak Hour	179	67	132	0	385	305	8	0	27	75	7	0	0	490	226	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 SB RAMPS Southbound				BROMLEY LN Westbound				I-76 SB RAMPS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	12	0	2	0	0	74	44	0	0	0	0	0	143	26	0	0
07:15 AM	21	0	5	0	0	76	43	0	0	0	0	0	131	30	0	0
07:30 AM	26	0	5	0	0	154	29	0	0	0	0	0	133	40	0	0
07:45 AM	31	0	3	0	0	158	27	0	0	0	0	0	140	31	0	0
Peak Hour	90	0	15	0	0	462	143	0	0	0	0	0	547	127	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 SB RAMPS Southbound				BROMLEY LN Westbound				I-76 SB RAMPS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	19	0	0	0	0	146	24	0	0	0	0	0	107	87	0	0
05:15 PM	16	0	2	0	0	146	18	0	0	0	0	0	85	90	0	0
05:30 PM	33	0	3	0	0	166	17	0	0	0	0	0	67	70	0	0
05:45 PM	23	0	2	0	0	156	23	0	0	0	0	0	76	56	0	0
Peak Hour	91	0	7	0	0	614	82	0	0	0	0	0	335	303	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 NB RAMPS Southbound				BROMLEY LN Westbound				I-76 NB RAMPS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	4	87	0	0	11	0	39	0	0	19	11	0
07:15 AM	0	0	0	0	4	70	0	0	22	0	44	0	0	23	12	0
07:30 AM	0	0	0	0	4	85	0	0	14	0	94	0	0	34	10	0
07:45 AM	0	0	0	0	4	82	0	0	21	1	96	0	0	21	10	0
Peak Hour	0	0	0	0	16	324	0	0	68	1	273	0	0	97	43	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 NB RAMPS Southbound				BROMLEY LN Westbound				I-76 NB RAMPS Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	8	55	0	0	60	0	115	0	0	53	32	0
05:15 PM	0	0	0	0	11	45	0	0	52	0	116	0	0	58	37	0
05:30 PM	0	0	0	0	9	61	0	0	47	0	126	0	0	46	24	0
05:45 PM	0	0	0	0	8	51	0	0	43	0	129	0	0	35	33	0
Peak Hour	0	0	0	0	36	212	0	0	202	0	486	0	0	192	126	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				BROMLEY LN Westbound				EAST FRONTAGE RD Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	1	0	2	0	4	85	0	0	0	0	0	0	0	22	8	0
07:15 AM	4	0	4	0	8	63	0	0	0	0	0	0	0	29	16	0
07:30 AM	6	0	5	0	5	75	0	0	0	0	0	0	0	41	3	0
07:45 AM	4	0	7	0	1	83	0	0	0	0	0	0	0	35	9	0
Peak Hour	15	0	18	0	18	306	0	0	0	0	0	0	0	127	36	0

Start Date: 4/24/2013
 Start Time: 5:00:00 PM
 Site Code: 00000000

Comment 1:
 Comment 2:
 Comment 3:
 Comment 4:

Start Time	EAST FRONTAGE RD Southbound				BROMLEY LN Westbound				EAST FRONTAGE RD Northbound				BROMLEY LN Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	6	0	6	0	0	56	0	0	0	0	0	0	0	93	13	0
05:15 PM	1	0	2	0	4	54	0	0	0	0	0	0	0	104	14	0
05:30 PM	13	0	1	0	3	57	0	0	0	0	0	0	0	80	12	0
05:45 PM	5	0	3	0	5	49	0	0	0	0	0	0	0	62	15	0
Peak Hour	25	0	12	0	12	216	0	0	0	0	0	0	0	339	54	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	PICADILLY RD Southbound				BROMLEY LN - 152ND AVE Westbound				PICADILLY RD Northbound				BROMLEY LN - 152ND AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	0	67	5	0	1	0	18	0	7	13	0	0
07:15 AM	0	0	0	0	0	54	8	0	2	0	14	0	16	16	0	1
07:30 AM	0	0	0	0	0	83	7	0	1	0	14	0	29	16	0	0
07:45 AM	0	0	0	0	0	47	11	0	1	0	12	0	16	20	0	0
Peak Hour	0	0	0	0	0	251	31	0	5	0	58	0	68	65	0	1

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	PICADILLY RD Southbound				BROMLEY LN - 152ND AVE Westbound				PICADILLY RD Northbound				BROMLEY LN - 152ND AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	26	6	0	2	0	22	0	9	76	0	0
05:15 PM	0	0	0	0	0	29	2	0	3	0	21	0	14	69	0	0
05:30 PM	0	0	0	0	0	37	1	0	5	0	15	0	9	68	0	0
05:45 PM	0	0	0	0	0	40	3	0	4	0	17	0	9	49	0	0
Peak Hour	0	0	0	0	0	132	12	0	14	0	75	0	41	262	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	50TH ST Southbound				WEST FRONTAGE RD Westbound				50TH ST Northbound				WEST FRONTAGE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	115	0	0	0	0	35	0	0	0	0	0	0	0	11	22	0
07:15 AM	88	0	0	0	1	39	0	0	0	0	0	0	0	17	30	0
07:30 AM	123	0	0	0	0	30	0	0	0	0	0	0	0	21	64	0
07:45 AM	141	0	0	0	0	39	0	0	0	0	0	0	0	26	65	0
Peak Hour	467	0	0	0	1	143	0	0	0	0	0	0	0	75	181	0

File Name: W:\NATHAN TMCS\2013\BRIGHTON TMCS 4-2013\1 HOUR\#10 50TH&WESTFRONTAGEPM.ppd

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	50TH ST Southbound				WEST FRONTAGE RD Westbound				50TH ST Northbound				WEST FRONTAGE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	65	0	0	0	2	31	0	0	0	0	0	0	0	57	137	0
05:15 PM	71	0	0	1	0	23	0	0	0	0	0	0	0	38	124	0
05:30 PM	68	0	0	0	1	30	0	0	0	0	0	0	0	46	117	0
05:45 PM	75	0	0	0	1	26	0	0	0	0	0	0	0	49	140	0
Peak Hour	279	0	0	1	4	110	0	0	0	0	0	0	0	190	518	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	SOUTH LONSPUR DR Southbound				WEST FRONTAGE RD Westbound				SOUTH LONSPUR DR Northbound				WEST FRONTAGE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	35	0	0	0	0	0	0	0	7	5	0	13	0	1	0
07:15 AM	0	19	0	0	0	0	0	0	0	8	5	0	7	0	3	0
07:30 AM	4	13	0	0	0	0	0	0	0	15	9	0	16	0	3	0
07:45 AM	4	19	0	0	0	0	0	0	0	13	8	0	23	0	9	0
Peak Hour	8	86	0	0	0	0	0	0	0	43	27	0	59	0	16	0

Start Date: 4/24/2013
 Start Time: 5:00:00 PM
 Site Code: 00000000

Comment 1:
 Comment 2:
 Comment 3:
 Comment 4:

Start Time	WEST FRONTAGE RD Southbound				SOUTH LONSPUR DR Westbound				WEST FRONTAGE RD Northbound				SOUTH LONSPUR DR Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	13	0	0	0	0	0	0	0	34	13	0	8	0	13	1
05:15 PM	2	15	0	1	0	0	0	0	0	24	21	0	17	0	10	1
05:30 PM	1	19	0	1	0	0	0	0	0	31	18	0	14	0	8	0
05:45 PM	4	14	0	2	0	0	0	0	0	18	8	0	13	0	6	2
Peak Hour	7	61	0	4	0	0	0	0	0	107	60	0	52	0	37	4

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	NORTH LONSPUR DR Southbound				WEST FRONTAGE RD Westbound				NORTH LONSPUR DR Northbound				WEST FRONTAGE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	2	16	0	0	0	0	0	0	0	2	7	0	14	0	1	0
07:15 AM	0	14	0	0	0	0	0	0	0	8	3	0	7	0	1	0
07:30 AM	4	17	0	0	0	0	0	0	0	6	13	0	2	0	0	0
07:45 AM	17	14	0	0	0	0	0	0	0	17	6	0	8	0	4	0
Peak Hour	23	61	0	0	0	0	0	0	0	33	29	0	31	0	6	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	NORTH LONSPUR DR Southbound				WEST FRONTAGE RD Westbound				NORTH LONSPUR DR Northbound				WEST FRONTAGE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	2	10	0	0	0	0	0	0	0	25	20	0	2	0	0	0
05:15 PM	2	17	0	0	0	0	0	0	0	25	15	0	2	0	1	0
05:30 PM	1	11	0	0	0	0	0	0	0	23	15	0	6	0	0	0
05:45 PM	3	13	0	0	0	0	0	0	0	17	6	0	5	0	0	0
Peak Hour	8	51	0	0	0	0	0	0	0	90	56	0	15	0	1	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	50TH ST Southbound				160TH AVE Westbound				50TH ST Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	17	22	2	0	4	70	6	0	4	19	27	1	37	32	6	0
07:15 AM	20	32	9	0	4	46	4	0	2	16	26	0	30	45	13	0
07:30 AM	25	39	3	0	2	72	6	0	4	20	23	0	41	35	13	0
07:45 AM	21	26	3	0	1	83	4	0	2	25	33	0	27	54	18	0
Peak Hour	83	119	17	0	11	271	20	0	12	80	109	1	135	166	50	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	50TH ST Southbound				160TH AVE Westbound				50TH ST Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	20	26	3	0	4	57	7	0	3	25	41	0	27	57	26	0
05:15 PM	14	22	2	0	6	65	7	0	3	27	42	0	31	72	26	0
05:30 PM	17	11	0	1	4	62	5	0	2	29	46	0	35	66	28	0
05:45 PM	20	20	5	0	2	52	1	0	4	36	44	0	35	45	25	0
Peak Hour	71	79	10	1	16	236	20	0	12	117	173	0	128	240	105	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	PRARIE FALCON PKWY Southbound				160TH AVE Westbound				PRARIE FALCON PKWY Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	12	2	15	1	0	38	0	0	2	3	13	0	5	30	4	0
07:15 AM	5	4	12	1	3	31	0	0	0	0	13	0	15	38	5	0
07:30 AM	5	0	9	0	7	49	0	0	1	0	13	0	6	29	8	0
07:45 AM	13	8	3	0	1	55	1	0	2	2	13	1	28	32	6	0
Peak Hour	35	14	39	2	11	173	1	0	5	5	52	1	54	129	23	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	PRARIE FALCON PKWY Southbound				160TH AVE Westbound				PRARIE FALCON PKWY Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	5	1	4	0	10	51	2	0	2	1	15	0	10	40	12	0
05:15 PM	11	0	5	0	12	48	1	0	0	1	10	0	13	54	11	0
05:30 PM	5	3	4	0	15	67	3	0	0	2	4	1	10	43	8	0
05:45 PM	3	0	8	0	5	46	3	1	0	0	4	0	7	45	10	0
Peak Hour	24	4	21	0	42	212	9	1	2	4	33	1	40	182	41	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	GOLDEN EAGLE PKWY Southbound				160TH AVE Westbound				GOLDEN EAGLE PKWY Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	0	0	0	0	1	0	3	0	3	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	1	0	4	0	1	0	1	0	0	0
Peak Hour	0	0	0	0	0	0	1	0	7	0	6	0	5	0	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	GOLDEN EAGLE PKWY Southbound				160TH AVE Westbound				GOLDEN EAGLE PKWY Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	0	0	0	1	0	1	0	3	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
05:30 PM	0	0	0	0	0	0	1	0	2	0	2	0	6	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Peak Hour	0	0	0	0	0	0	1	0	4	0	4	0	10	0	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WEST FRONTAGE RD Southbound				160TH AVE Westbound				WEST FRONTAGE RD Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	15	2	0	0	0	22	0	0	2	0	2	0	16	12	11	0
07:15 AM	20	4	1	0	1	9	0	0	3	1	3	0	12	31	8	0
07:30 AM	20	1	1	0	0	30	3	0	0	2	3	0	10	22	8	0
07:45 AM	23	10	0	0	0	25	10	0	0	5	11	0	10	23	9	0
Peak Hour	78	17	2	0	1	86	13	0	5	8	19	0	48	88	36	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WEST FRONTAGE RD Southbound				160TH AVE Westbound				WEST FRONTAGE RD Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	20	4	0	0	0	27	1	0	1	2	15	0	10	18	15	0
05:15 PM	22	6	0	0	1	18	2	0	2	7	18	0	9	30	12	0
05:30 PM	30	4	0	0	0	36	2	0	2	9	17	0	6	28	17	0
05:45 PM	25	2	1	0	0	23	2	0	1	8	7	0	11	25	16	0
Peak Hour	97	16	1	0	1	104	7	0	6	26	57	0	36	101	60	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				160TH AVE Westbound				EAST FRONTAGE RD Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	5	3	0	0	0	11	1	0	0	0	1	0	12	2	5	0
07:15 AM	2	5	0	0	1	8	1	0	0	1	3	0	24	6	5	0
07:30 AM	10	0	0	0	0	17	1	0	0	0	8	0	6	6	7	0
07:45 AM	9	3	1	0	1	17	0	0	1	1	5	0	14	5	4	0
Peak Hour	26	11	1	0	2	53	3	0	1	2	17	0	56	19	21	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				160TH AVE Westbound				EAST FRONTAGE RD Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	1	1	1	0	0	6	0	0	1	2	19	0	3	10	5	0
05:15 PM	1	0	0	0	0	9	0	0	3	2	14	0	5	21	8	0
05:30 PM	1	2	0	0	0	10	0	0	1	2	27	0	3	17	8	0
05:45 PM	0	1	1	0	0	10	0	0	0	2	10	0	2	16	8	0
Peak Hour	3	4	2	0	0	35	0	0	5	8	70	0	13	64	29	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				BROMLEY BUSINESS PKWY Westbound				EAST FRONTAGE RD Northbound				BROMLEY BUSINESS PKWY Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	15	1	0	0	0	0	0	1	1	0	0	0	0	0	0
07:15 AM	0	27	1	0	2	0	0	0	1	2	0	0	0	0	0	0
07:30 AM	0	6	2	0	0	0	2	0	1	10	0	0	0	0	0	0
07:45 AM	0	16	1	0	1	0	2	0	0	4	0	0	0	0	0	0
Peak Hour	0	64	5	0	3	0	4	0	3	17	0	0	0	0	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				BROMLEY BUSINESS PKWY Westbound				EAST FRONTAGE RD Northbound				BROMLEY BUSINESS PKWY Eastbound			
	Right	Thru	Left	Other	Right	Thru	Left	Other	Right	Thru	Left	Other	Right	Thru	Left	Other
05:00 PM	0	5	0	0	2	0	2	0	1	21	0	0	0	0	0	0
05:15 PM	0	5	0	0	0	0	0	0	0	18	0	0	0	0	0	0
05:30 PM	0	5	0	0	0	0	0	0	0	30	0	0	0	0	0	0
05:45 PM	0	3	1	0	0	0	2	0	0	12	0	0	0	0	0	0
Peak Hour	0	18	1	0	2	0	4	0	1	81	0	0	0	0	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	GUN CLUB RD Southbound				160TH AVE Westbound				GUN CLUB RD Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	1	0	0	0	9	1	0	0	0	4	0	1	1	0	0
07:15 AM	0	0	0	0	0	7	1	0	0	0	2	0	2	3	0	0
07:30 AM	0	0	0	0	0	13	0	0	0	0	4	0	1	5	0	0
07:45 AM	0	0	0	0	0	18	1	0	2	0	3	0	0	6	0	0
Peak Hour	0	1	0	0	0	47	3	0	2	0	13	0	4	15	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	GUN CLUB RD Southbound				160TH AVE Westbound				GUN CLUB RD Northbound				160TH AVE Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	5	0	0	0	0	1	0	3	11	1	0
05:15 PM	0	0	0	0	0	5	0	0	1	0	6	0	8	13	0	0
05:30 PM	0	0	0	0	0	7	0	0	2	0	1	0	5	13	1	0
05:45 PM	0	0	0	0	0	7	1	0	1	0	2	0	7	14	0	0
Peak Hour	0	0	0	0	0	24	1	0	4	0	10	0	23	51	2	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	HARVEST RD Southbound				BASELINE RD Westbound				HARVEST RD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other												
07:00 AM	6	0	1	0	0	25	1	0	0	1	1	0	2	11	3	0
07:15 AM	2	0	0	0	0	26	0	0	0	1	0	0	0	15	5	0
07:30 AM	10	1	0	0	0	52	0	0	0	2	1	0	0	3	0	0
07:45 AM	7	0	1	0	1	22	0	0	1	0	0	0	0	4	2	0
Peak Hour	25	1	2	0	1	125	1	0	1	4	2	0	2	33	10	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	HARVEST RD Southbound				BASELINE RD Westbound				HARVEST RD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other												
05:00 PM	1	0	1	0	0	16	0	0	2	3	3	0	0	41	8	0
05:15 PM	3	1	0	0	1	14	0	1	0	3	3	0	3	40	6	0
05:30 PM	5	1	0	0	0	15	0	0	0	0	1	0	3	40	6	0
05:45 PM	2	0	1	0	0	14	0	0	3	1	3	0	1	24	8	0
Peak Hour	11	2	2	0	1	59	0	1	5	7	10	0	7	145	28	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				BASELINE RD Westbound				EAST FRONTAGE RD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	0	27	5	0	1	0	3	0	3	15	0	0
07:15 AM	0	0	0	0	0	28	3	0	5	0	3	0	3	15	0	0
07:30 AM	0	0	0	0	0	48	11	0	1	0	6	0	0	2	0	0
07:45 AM	0	0	0	0	0	30	8	0	1	0	4	0	4	6	0	0
Peak Hour	0	0	0	0	0	133	27	0	8	0	16	0	10	38	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	EAST FRONTAGE RD Southbound				BASELINE RD Westbound				EAST FRONTAGE RD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	15	1	0	2	0	5	0	2	45	0	0
05:15 PM	0	0	0	0	0	22	0	0	1	0	9	0	1	49	0	0
05:30 PM	0	0	0	0	0	18	2	0	3	0	6	0	1	46	0	0
05:45 PM	0	0	0	0	0	22	0	0	3	0	5	0	2	30	0	0
Peak Hour	0	0	0	0	0	77	3	0	9	0	25	0	6	170	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 NB RAMPS Southbound				BASELINE RD Westbound				I-76 NB RAMPS Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	3	30	0	0	4	0	16	0	0	14	12	0
07:15 AM	0	0	0	0	1	30	0	0	4	1	29	0	0	15	27	0
07:30 AM	0	0	0	0	6	45	0	0	1	0	29	0	0	1	32	0
07:45 AM	0	0	0	0	2	27	0	0	3	0	21	0	0	8	27	0
Peak Hour	0	0	0	0	12	132	0	0	12	1	95	0	0	38	98	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 NB RAMPS Southbound				BASELINE RD Westbound				I-76 NB RAMPS Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	2	16	0	0	36	0	81	0	0	16	26	0
05:15 PM	0	0	0	0	5	22	0	1	32	1	104	0	0	14	28	0
05:30 PM	0	0	0	0	7	18	0	0	27	0	90	0	0	17	28	0
05:45 PM	0	0	0	0	5	23	0	0	21	1	102	0	0	14	15	0
Peak Hour	0	0	0	0	19	79	0	1	116	2	377	0	0	61	97	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 SB RAMPS Southbound				BASELINE RD Westbound				I-76 SB RAMPS Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	14	0	1	0	0	33	20	0	0	0	0	0	102	29	0	0
07:15 AM	21	0	2	0	0	37	15	0	0	0	0	0	96	44	0	0
07:30 AM	28	0	1	0	0	48	27	0	0	0	0	0	83	35	0	0
07:45 AM	28	0	4	0	0	31	19	0	0	0	0	0	75	25	0	0
Peak Hour	91	0	8	0	0	149	81	0	0	0	0	0	356	133	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	I-76 SB RAMPS Southbound				BASELINE RD Westbound				I-76 SB RAMPS Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	29	0	2	0	0	94	10	0	0	0	0	0	40	41	0	0
05:15 PM	36	2	1	0	0	113	5	0	0	0	0	0	30	42	0	0
05:30 PM	42	0	2	0	0	108	8	0	0	0	0	0	40	36	0	0
05:45 PM	29	0	2	0	0	116	5	0	0	0	0	0	25	33	0	0
Peak Hour	136	2	7	0	0	431	28	0	0	0	0	0	135	152	0	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WEST FRONTAGE RD Southbound				BASELINE RD Westbound				WEST FRONTAGE RD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	7	11	47	0	10	27	7	0	3	5	1	0	0	84	8	0
07:15 AM	13	11	41	0	17	33	9	0	6	3	2	0	2	88	7	0
07:30 AM	4	8	42	0	23	36	15	0	3	6	1	0	0	78	7	0
07:45 AM	13	15	30	0	17	27	15	0	7	4	3	0	9	68	6	0
Peak Hour	37	45	160	0	67	123	46	0	19	18	7	0	11	318	28	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WEST FRONTAGE RD Southbound				BASELINE RD Westbound				WEST FRONTAGE RD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	12	14	20	0	39	74	5	0	9	12	1	0	4	52	15	0
05:15 PM	7	18	17	1	54	86	10	0	6	11	3	0	4	45	9	0
05:30 PM	13	9	26	0	35	90	11	0	9	11	5	0	0	44	11	0
05:45 PM	16	7	20	0	67	76	16	0	6	11	2	0	1	39	6	0
Peak Hour	48	48	83	1	195	326	42	0	30	45	11	0	9	180	41	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	BONANZA BLVD Southbound				BASELINE RD Westbound				BONANZA BLVD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	12	0	21	0	13	24	0	0	0	0	0	0	0	68	8	0
07:15 AM	13	0	43	0	14	32	0	0	0	0	0	0	0	58	11	0
07:30 AM	17	0	22	0	8	32	0	0	0	0	0	0	0	58	8	0
07:45 AM	10	0	25	0	11	30	0	0	0	0	0	0	0	58	17	0
Peak Hour	52	0	111	0	46	118	0	0	0	0	0	0	0	242	44	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	BONANZA BLVD Southbound				BASELINE RD Westbound				BONANZA BLVD Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	17	0	14	0	14	68	0	0	0	0	0	0	0	53	13	0
05:15 PM	13	0	9	0	23	72	0	0	0	0	0	0	0	51	22	0
05:30 PM	14	0	7	0	25	82	0	0	0	0	0	0	0	50	11	0
05:45 PM	12	0	9	0	22	72	0	0	0	0	0	0	0	34	24	0
Peak Hour	56	0	39	0	84	294	0	0	0	0	0	0	0	188	70	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WAGON TRAIL AVE Southbound				BASELINE RD Westbound				WAGON TRAIL AVE Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	2	0	23	0	2	35	0	0	0	0	0	0	0	53	3	0
07:15 AM	4	0	14	0	2	44	0	0	0	0	0	0	0	57	2	0
07:30 AM	6	0	9	0	2	43	0	0	0	0	0	0	0	56	0	0
07:45 AM	2	0	21	0	2	41	0	0	0	0	0	0	0	54	3	0
Peak Hour	14	0	67	0	8	163	0	0	0	0	0	0	0	220	8	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	WAGON TRAIL AVE Southbound				BASELINE RD Westbound				WAGON TRAIL AVE Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	5	0	16	72	0	0	0	0	0	0	0	63	2	0
05:15 PM	3	0	7	0	15	72	0	0	0	0	0	0	0	64	6	0
05:30 PM	1	0	9	0	15	83	0	0	0	0	0	0	0	52	8	0
05:45 PM	2	0	7	0	11	73	0	0	0	0	0	0	0	52	7	0
Peak Hour	6	0	28	0	57	300	0	0	0	0	0	0	0	231	23	0

Start Date: 4/24/2013

Start Time: 7:00:00 AM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	50TH AVE Southbound				BASELINE RD Westbound				50TH AVE Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
07:00 AM	0	0	0	0	0	48	18	0	6	0	16	0	9	39	0	0
07:15 AM	0	0	0	0	0	48	23	0	10	0	17	0	15	35	0	0
07:30 AM	0	0	0	0	0	56	23	0	9	0	10	0	7	33	0	0
07:45 AM	0	0	0	0	0	50	15	0	13	0	11	0	7	25	0	0
Peak Hour	0	0	0	0	0	202	79	0	38	0	54	0	38	132	0	0

Start Date: 4/24/2013

Start Time: 5:00:00 PM

Site Code: 00000000

Comment 1: Default Comments

Comment 2: Change These in The Preferences Window

Comment 3: Select File/Preference in the Main Scree

Comment 4: Then Click the Comments Tab

Start Time	50TH AVE Southbound				BASELINE RD Westbound				50TH AVE Northbound				BASELINE RD Eastbound			
	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
05:00 PM	0	0	0	0	0	60	16	0	26	0	8	0	18	73	0	0
05:15 PM	0	0	0	0	0	59	15	0	21	0	7	0	18	77	0	0
05:30 PM	0	0	0	0	0	68	14	0	27	0	8	0	11	57	0	0
05:45 PM	0	0	0	0	0	62	21	0	33	0	10	0	16	69	0	0
Peak Hour	0	0	0	0	0	249	66	0	107	0	33	0	63	276	0	0

I-76 & Bridge Street INTERCHANGE



C.3 – Signal Timings

9 + Key			C + F + Key		
FUNCTION	KEY	VALUE	FUNCTION	KEY	VALUE
Short Power Down	0	4	Page ID	0	0
Long Power Down	1	4	Reserved	1	0
EVA Delay Type	2	0	Reserved	2	0
EVB Delay Type	3	0	Reserved	3	0
EVC Delay Type	4	0	OLA Red	4	0.0
EVD Delay Type	5	0	OLB Red	5	0.0
RR Delay Type	6	0	OLC Red	6	0.0
Ped Inhibit	7	0	OLD Red	7	0.0
OLA Green	8	0.0			12345678
OLA Yellow	9	0.0	Overlap E	8	
OLB Green	A	0.0	Overlap F	9	
OLB Yellow	B	0.0	Red Rest	A	
OLC Green	C	0.0	Max Recall	B	
OLC Yellow	D	0.0	Flash Green	C	
OLD Green	E	0.0	Flash Walk	D	
OLD Yellow	F	0.0	Advance Walk	E	
			Restrictive Phase	F	

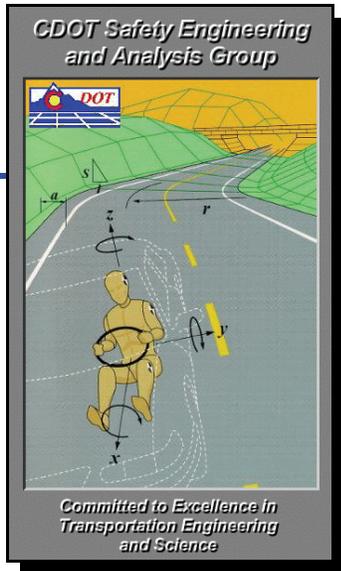
61 - Bridge @ 50th Ave
 Table 3 - Preempts
 3/28/2012
 4:40 PM

C + Key			E + Key					
FUNCTION	KEY	VALUE	FUNCTION	KEY	VALUE	FUNCTION	KEY	VALUE
Year	0		EVA Delay	0		EVE Delay		0
Month	1		EVA Minimum	1		EVE Minimum		0
Day of Month	2		EVB Delay	2		EVF Delay		0
		1234567	EVB Minimum	3		EVF Minimum		0
Day of Week	3		EVC Delay	4		EVG Delay		0
		VALUE	EVC Minimum	5		EVG Minimum		0
Hour	4		EVD Delay	6		EVH Delay		0
Minute	5		EVD Minimum	7		EVH Minimum		0
Second	6		OL Red Revert	8	5.0			
Reserved	7		RR Delay	9	0			
Triggers On In Flash	8		RR Clear	A	0			
		123456789ABCDEFG			123456789ABCDEFG			123456789ABCDEFG
Startup Yellow	9		RR Clear Phases	B		EVE Phases		
EVA Phases	A	2 5 2 6	RR Permit	C		EVF Phases		
EVB Phases	B	8	RR OL Permit	D		EVG Phases		
EVC Phases	C	4 6 4 8	NEMA Hold Phases	E		EVH Phases		
EVD Phases	D	4	Reserved	F		Reserved		
Handicap Ped	E							
Reserved	F							

61 - Bridge @ 50th Ave
 Table 6 - Coordination Functions
 3/28/2012 4:40 PM

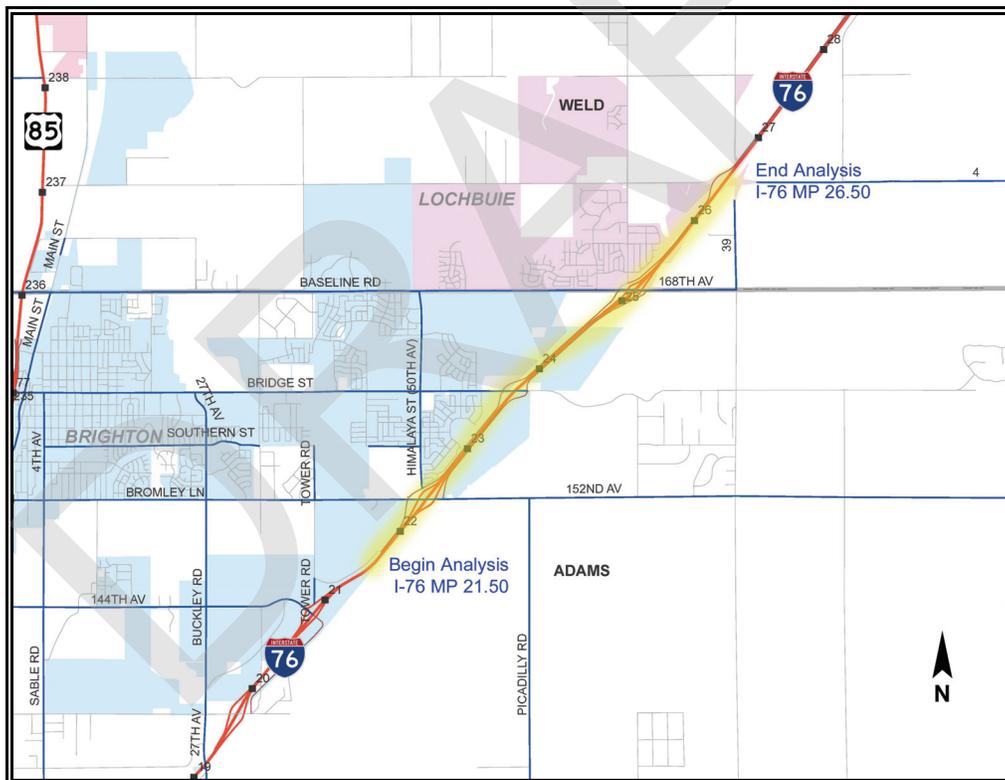
B + 0 + Key			D + Key		
FUNCTION	KEY	VALUE	FUNCTION	KEY	VALUE
Present Plan	0		0 Floating Ped	2E	0
TOD/DOW Plan	1		0 ID Number	2F	61
Hardwire Plan	2		0 No Coord Ped Recall	3E	0
Modem Plan	3		0 Rest In Walk	3F	0
Mode (0-4)	4		0 Adv Warning EOG	4E	0
Master (0 = Off)	5		0 Adv Warning SOG	4F	0
Master Clock	6		0 RR Red Clear	5E	0
Local Clock	7		0 RR Clear Color	5F	0
Dwell Clock	8		0 Bus Delay	6D	0.0
Reserved	9		0 Bus Free T1	6E	0
Reserved	A		0 Bus Free T3	6F	0
Reserved	B		0 EV Min After Clear	7E	0
		123456789ABCDEFG	EV Indicators	7F	0
Reserved	C		NEMA Inputs	66	0
NEMA CNA Phase	D		Reserved		0
Adv Warning Phase	E		Reserved		0
MRI Phase	F				

SAFETY ASSESSMENT REPORT



I-76: MP 21.50 to MP 26.50
Environmental Assessment (EA)

Bridge St Interchange
August 2013



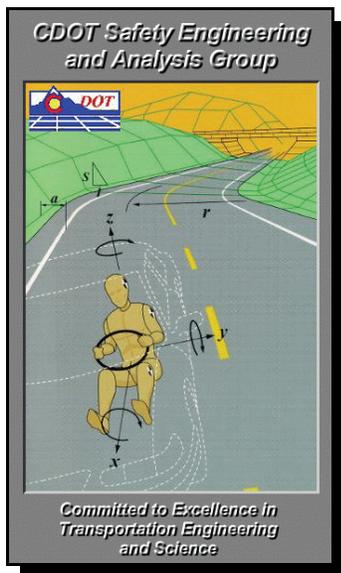
Prepared by: **The Colorado Department of Transportation**
Safety and Traffic Engineering Branch
Safety Engineering and Analysis Group
4201 E. Arkansas Ave.
Denver, CO 80222

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A Statement of Philosophy

The efficient and responsible investment of resources in addressing safety problems is a difficult task. Since crashes occur on all highways in use, it is inappropriate to say of any highway that it is safe. However, it is correct to say that highways can be built to be safer or less safe. Road safety is a matter of degree. When making decisions effecting road safety it is critical to understand that expenditure of limited available funds on improvements in places where it prevents few injuries and saves few lives can mean that injuries will occur and lives will be lost by not spending them in places where more accidents could have been prevented¹. It is CDOT's objective to maximize accident reduction within the limitations of available budgets by making road safety improvements at locations where it does the most good or prevents the most accidents.

Introduction

The Transportation Equity Act for the 21st Century (TEA-21) of 1998 requires explicit consideration of safety in the transportation planning process. While this government mandate is well intentioned, little is known about how to accomplish it. In order to meet this requirement, we have employed a recently developed concept of the Level of Service of Safety² (LOSS). The LOSS concept makes it possible to accomplish the following:

- Qualitatively describe the degree of safety or un-safety of a roadway segment.
- Effectively communicate the magnitude of the safety problem to other professionals or elected officials.
- Bring perception of roadway safety in line with reality of safety performance reflecting a specific facility.
- Provide a frame of reference from a safety perspective for planning major corridor improvements.

The scope of the safety chapter of the Environmental Assessment (EA) is as follows:

- Assess the magnitude and nature of the safety problem within the project limits.
- Relate accident causality to roadway geometrics, roadside features, traffic control devices, traffic operations, driver behavior and vehicle type.
- Suggest counter measures to address identified problems.
- Provide guidance on how to identify the preferred alternative from a safety standpoint.

The safety chapter of the EA will prepare a framework for the evaluation of alternatives from a safety standpoint.

¹ Hauer, E. (1999) *Safety Review of Highway 407: Confronting Two Myths*. TRB

² Kononov, J. & Allery, B. (2003) *Level of Service of Safety-Conceptual Blueprint and Analytical Framework*. Presented at the TRB Annual Meeting, Washington D.C. (January 2003)

Site Location and Conditions

This study addresses I-76 in both Adams and Weld counties including the city of Brighton and the town of Lochbuie. The I-76 study segment starts at milepoint (MP) 21.50 and ends at MP 26.50. The included distance is approximately 5 miles. This segment includes an interchange with Bromley Lane at MP 22.41 and with Baseline Rd / 168th Ave at MP 25.15. Bridge St / 160th Ave crosses I-76 at MP 23.71.

I-76 is classified as an “Urban Interstate” in a flat and rolling environment from the beginning of the study segment to the Baseline Rd interchange. The section of I-76 northeast of the Baseline interchange is considered “Rural Interstate”. The interstate is a four lane divided facility with a depressed median. There are frontage roads along both sides of I-76. The average annual daily traffic (AADT) for 2011 starts at 31,000 ADT at MP 21.50 and steadily decreases to 17,000 ADT by MP 26.50 (see CORIS Listing in **Appendix**). Truck traffic ranges from 15 to 17 percent of total traffic throughout the study segment. The posted speed limit along mainline I-76 is 75 miles per hour (mph).

Accident History and Problem Analysis

The accident history for the period of January 1, 2008 through December 31, 2012 (a total of five years) was examined to locate accident clusters and identify accident causes. In the study period, 198 crashes were reported along I-76 between MP 21.50 and MP 26.50. This total includes all the crashes that occurred within the interchange area as well as the frontage roads. There were 24 collisions that caused injuries and two that resulted in fatalities. **Table 1A** summarizes the accident totals for I-76 over the five year period while **Table 1B** breaks down the I-76 accident totals by section. Totals attributed to the interchanges include all crashes occurring on the ramps and the cross street but do not include crashes occurring along mainline I-76.

Table 1A: Accident Totals for I-76 (MP 21.50 to MP 26.50)

Year	Number of Accidents			
	Property Damage Only	Evident Injury	Fatal	Total
2008	38	5	0	43
2009	38	4	0	42
2010	39	4	2	45
2011	31	3	0	34
2012	26	8	0	34
Total	172	24	2	198
Average/Year	34.4	4.8	0.4	39.6

Table 1B: I-76 Accident Totals by Section (MP 21.50 to MP 26.50)

Section	Number of Accidents			
	Property Damage Only	Evident Injury	Fatal	Total
I-76 Mainline Only	67	14	2	83
Bromley Lane Interchange	49	4	0	53
Baseline Rd / 168th Ave Interchange	3	1	0	4
I-76 North Frontage Rd	50	4	0	54
I-76 South Frontage Rd	3	1	0	4
Total	172	24	2	198

Fatal Crash History

There were two fatal crashes within the study segment over the five year study period. The first crash occurred at 8:40 AM on January 11, 2010 at MP 25.53 along westbound I-76 where a large truck (tractor and semi-trailer) rear ended a sedan which locked the two vehicles, forcing them both off the road to the right into a fence. Although not killed initially, the driver of the second people did die nine days later as a result of this crash. There were no apparent roadway conditions or driver impairments factoring in this crash.

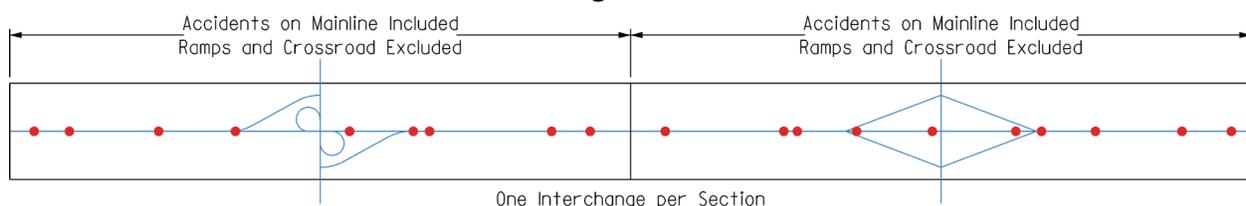
The second and most recent fatal crash occurred at 5:08 PM on December 14, 2010 at MP 22.80 along I-76 where an eastbound pickup truck lost control and crossed over the median into the opposing lanes and colliding head on with a westbound truck with trailer. After the collision the pickup truck overturned in the median. The driver of the pickup was airlifted to a hospital but was pronounced dead soon thereafter. There were no apparent roadway conditions or driver impairments factoring in this crash.

I-76 Highway Segment Analysis

We have refined the assessment of the magnitude of safety problems on highway segments through the use of Safety Performance Functions (SPF). The SPF reflects the complex relationship between traffic exposure measured in ADT, and accident count for a unit of road section measured in accidents per mile per year. The SPF models provide an estimate of the normal or expected accident frequency for a range of ADT among similar facilities.

All of the dataset preparation was performed using the Colorado Department of Transportation (CDOT) accident databases. Accident history for each facility was prepared using the most recent 10 years of available accident data. Average Daily Traffic (ADT) for each roadway segment for each of the 10 years was entered into the same dataset. **Figure 1A** illustrates how the dataset was prepared for urban and rural freeway facilities.

Figure 1A



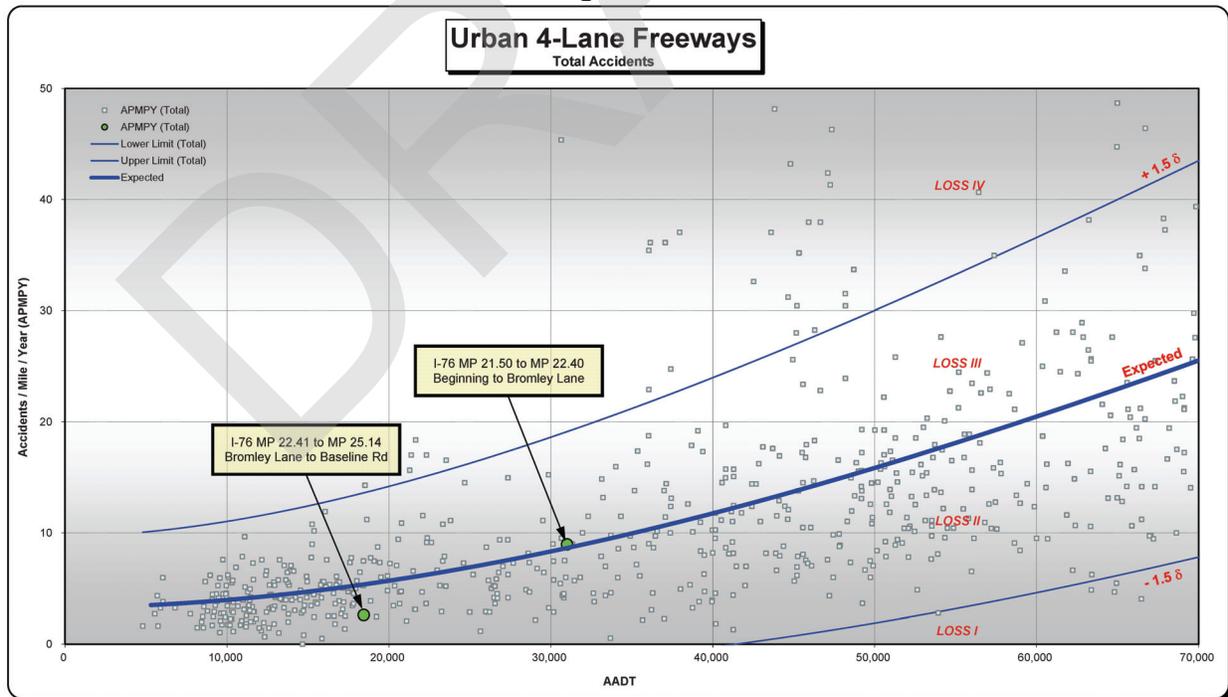
Development of the SPF lends itself well to the conceptual formulation of the Level of Service of Safety (LOSS). The concept of level of service uses qualitative measures that characterize safety of a roadway segment in reference to its expected performance and severity. If the level of safety predicted by the SPF will represent a normal or expected number of accidents at a specific level of ADT, then the degree of deviation from the norm can be stratified to represent specific levels of safety.

- LOSS I - Indicates a Low Potential for Accident Reduction
- LOSS II - Indicates a Better than Expected Safety Performance
- LOSS III - Indicates a Less than Expected Safety Performance
- LOSS IV - Indicates a High Potential for Accident Reduction

Gradual change in the degree of deviation of the LOSS boundary line from the fitted model mean reflects the observed increase of variability in accidents/mile as ADT increases. LOSS reflects how the roadway segment is performing in regard to its expected accident frequency at a specific level of ADT. It only provides an accident frequency comparison with the expected norm. It does not, however, provide any information related to the nature of the safety problem itself. If a safety problem is present, LOSS will only describe its magnitude from a frequency standpoint. The nature of the problem is determined through diagnostic analysis using direct diagnostics and pattern recognition techniques.

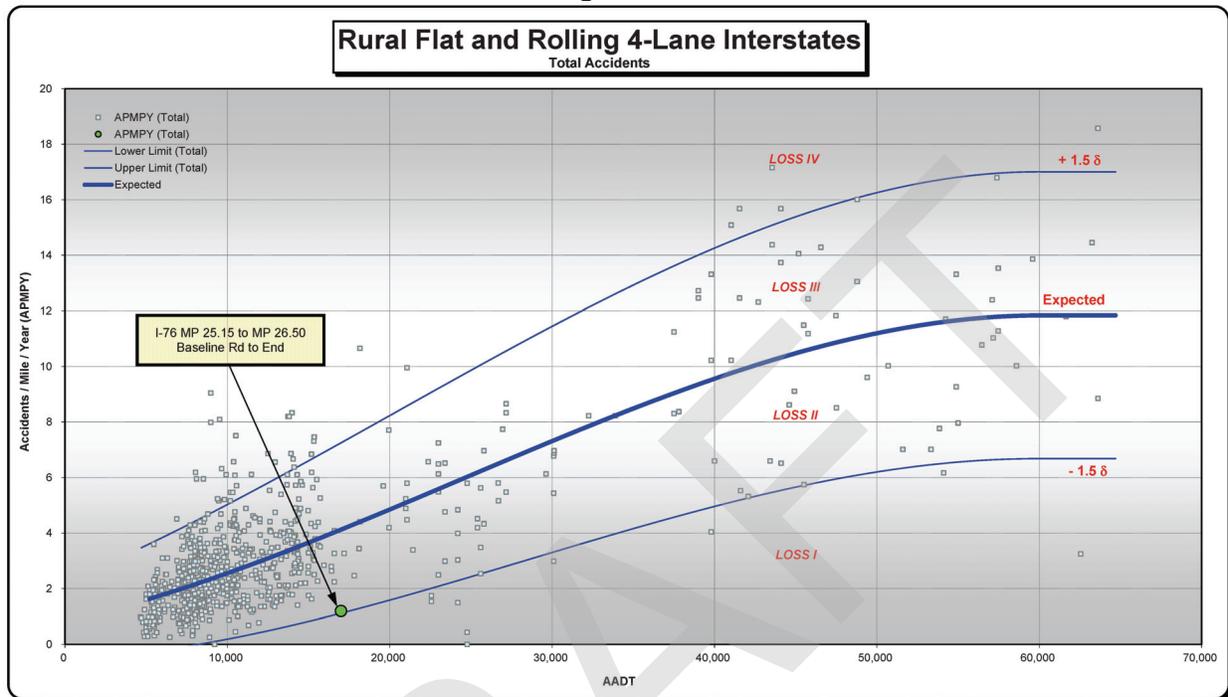
Accident history within the study period for I-76 covering the study segment has been plotted for evaluation. Accidents occurring on the cross streets and ramps at the interchanges have been omitted from this SPF analysis and will be addressed later in the interchange analysis section of this report. **Figure 1B** addresses the total number of accidents for the urban sections of I-76 while **Figure 1C** looks at the section that is considered rural.

Figure 1B



The SPF analysis for total accidents shown in **Figure 1B** shows that the I-76 segment between MP 21.50 and Bromley Lane had an accident frequency that was near expected safety performance (LOSS II / LOSS III) when compared to other 4-lane urban freeways within Colorado. The I-76 segment between Bromley Lane and Baseline Rd had an accident frequency that was better than expected (LOSS II).

Figure 1C



The SPF analysis for total accidents shown in **Figure 1C** shows that the I-76 segment between Baseline Rd and MP 26.50 had a better than expected safety performance and a low potential for accident reduction (LOSS I / LOSS II) when compared to other 4-lane rural interstates within Colorado.

Pattern Recognition Analysis

The roadways within the project limits were tested for the presence of patterns related to accident type, severity, direction of travel, road conditions, spatial distribution of accidents, time of day and behavioral attributes. Pattern recognition analysis for mainline I-76 was performed using normative percentages for diagnostics of safety problems for a 4-lane rural freeway. These diagnostic norms are developed using the same data points as those graphed in the SPF analysis. This section covers notable accident types and conditions over the study period for mainline I-76 from MP 21.50 to MP 26.50.

Figure 2A shows the accident distribution by accident type for mainline I-76. Collisions with fixed object was the most common accident type (33 percent). Other common accident types along this corridor include overturning vehicles (21 percent) and same direction sideswipes (18 percent).

Figure 2A

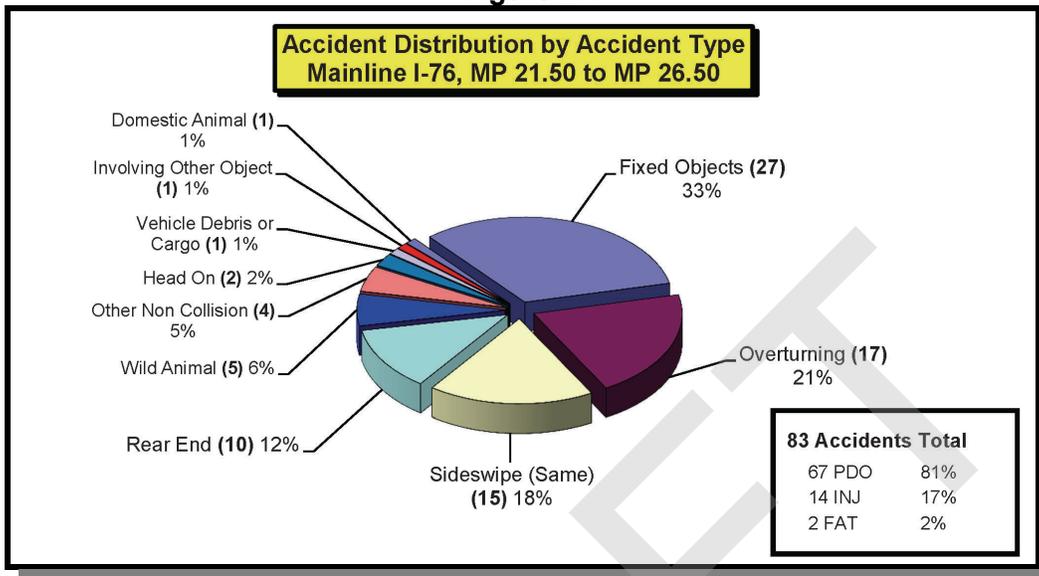
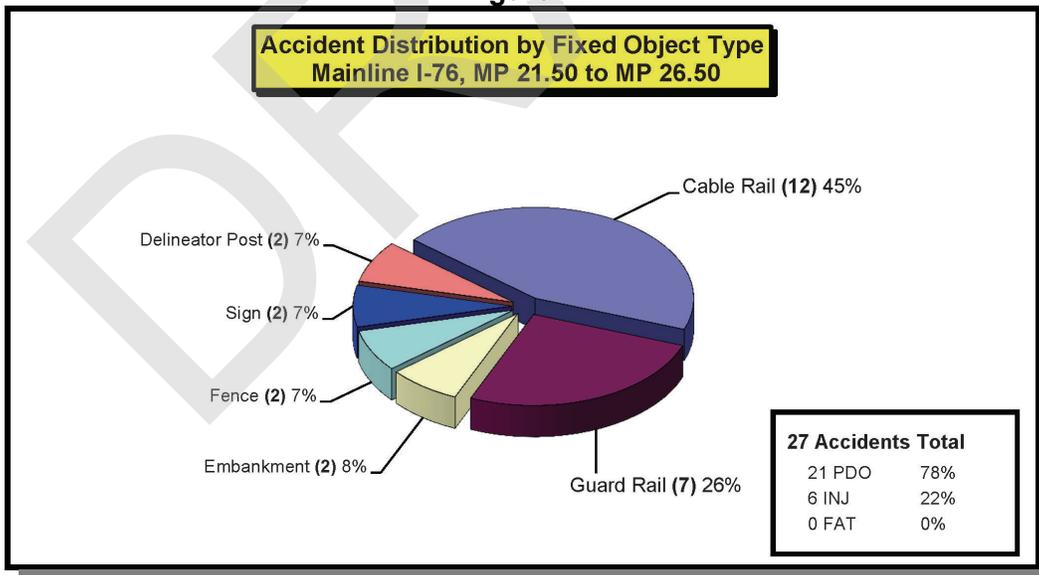


Figure 2B shows the breakdown of the fixed object accidents. Cable rail collisions accounted for the highest amount of fixed object accidents (45 percent). Another common fixed object collision type was guardrail (26 percent).

Figure 2B



There were 19 collisions with either cable rail or guard rail with four of these causing injuries (21 percent). All but two collisions were off the left side of the traveled way (89 percent) and seven collisions had taken place during nighttime hours (32 percent). The most notable contributing factor was icy or snowy road conditions which were present in eight of the crashes (42 percent). There were also three instances where the crash was caused by a driver asleep at the wheel (16 percent). Although there were a few injuries caused by these crashes, there was only one person who was considered seriously injured (incapacitated).

It is likely that the presence of cable rail and guard rail along this corridor are preventing vehicles from crossing the median which would result in a more serious crash like a head-on or sideswipe opposite direction. Additional cable rail was installed between Bromley Ln and Baseline Rd in early 2013 for a safety improvement project. This area covers where the fatal head-on crossover collision occurred in 2010. The entire stretch of I-76 within the study segment now has median cable rail. Similarly, rumble strips were installed between Bromley Ln and Baseline Rd in early 2013. Shoulder strips (inside/outside) are now present along I-76 north of Bromley Ln. This should help reduce crashes caused by drivers asleep at the wheel as well as any potential drivers that are fatigued or driving under the influence of alcohol or drugs.

Overtaking vehicles accounted for 17 crashes with five of these causing injuries (29 percent). There were not any notable patterns attached to this crash type other than seven of these occurring during nighttime hours (41 percent). The additional cable rail and rumble strips from the recent safety improvement project may serve to prevent or mitigate these crashes as well.

Although there were 15 sideswipe same direction collisions over the five year study period, no definitive patterns were detected among these crashes. Only one of these crashes resulted in an injury (7 percent). There are no suggestions for improvement at this time for this crash type.

I-76 and Bromley Lane Interchange Analysis

As seen in **Figure 3A**, the I-76 and Bromley Lane interchange is a standard diamond interchange. There were 53 accidents along the ramps and cross streets within this interchange area over the five year study period. **Table 2** breaks it down by section. The largest concentrations of crashes at the interchange occurred at each ramp termini, there were no accident patterns identified along the ramps or at the Bromley lane overpass.

Figure 3A
I-76 and Bromley Lane Interchange

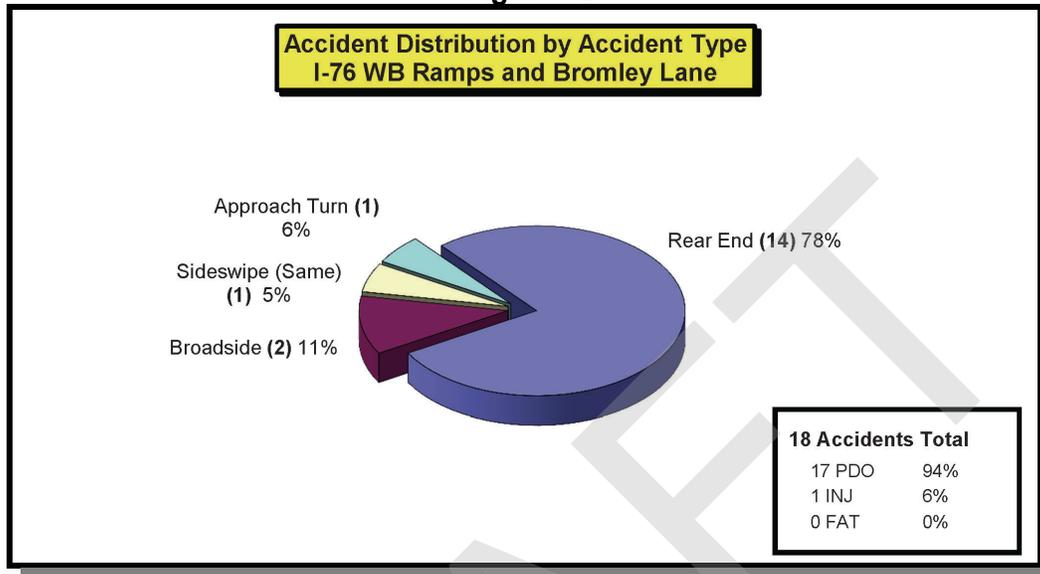


Table 2: I-76 and Bromley Lane Interchange Accident Totals by Section

Section	Number of Accidents			
	Property Damage Only	Evident Injury	Fatal	Total
I-76 WB Ramps / Bromley Lane	17	1	0	18
I-76 EB Ramps / Bromley Lane	20	2	0	22
I-76 EB Off Ramp	1	1	0	2
I-76 EB On Ramp	1	0	0	1
I-76 WB Off Ramp	2	0	0	2
I-76 WB On Ramp	4	0	0	4
Bromley Lane Crossing	4	0	0	4
Total	49	4	0	53

The I-76 westbound ramp termini with Bromley Lane is four leg intersection which is stop controlled for the off ramp traffic only. There were 18 crashes over the five year study period which is higher than expected for this type of ramp intersection (unsignalized 2-lane mainline, LOSS IV). **Figure 3B** shows the accident distribution by accident type for the I-76 westbound ramp termini with Bromley Lane. The majority of crashes were rear end collisions (78 percent).

Figure 3B



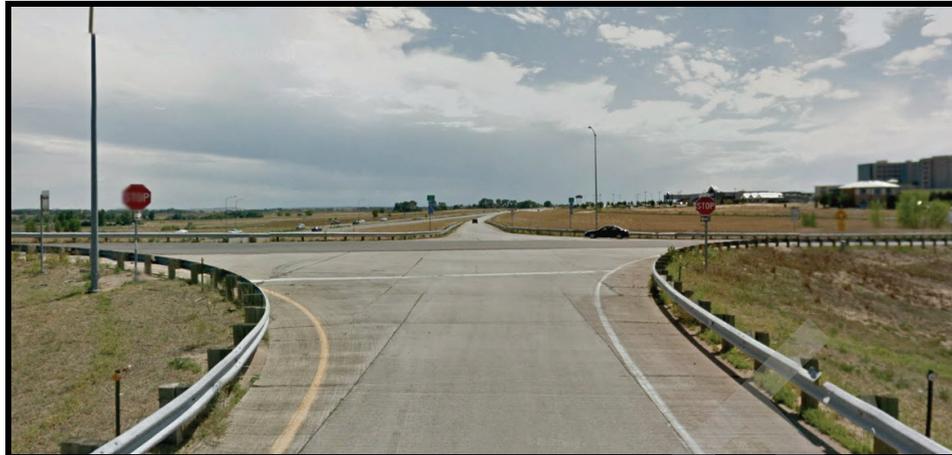
The most common type of rear end collisions were from I-76 westbound off ramp vehicles attempting to make a right turn onto Bromley Lane (six occurrences). The intersection area is very wide to allow for large truck turning movements and also surrounded by guardrail on all sides which may pose a slight sight distance hindrance (**Figures 3C** and **3D**). The ramp intersection is also slightly skewed in a way that makes it more difficult to right turning drivers from the off ramp to see westbound oncoming traffic on Bromley Lane and the vehicle in front of them at the same time.

Figure 3C

I-76 WB Off Ramp at Bromley Lane (Aerial View)



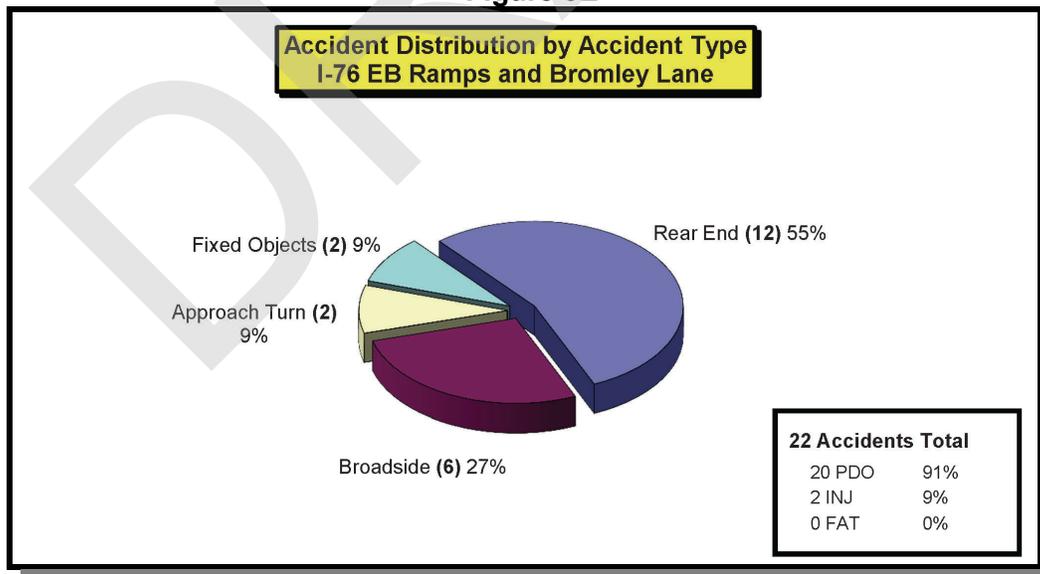
Figure 3D
I-76 WB Off Ramp at Bromley Lane (Street View)



Altering the geometric configuration of the ramp termini into a right angle or construction of a roundabout may help reduce these types of crashes. However, intersection reconfiguration may be outside the scope of a new interchange project at Bridge St and could be considered as part of a separate safety improvement project.

The I-76 eastbound ramp termini with Bromley Lane is four leg intersection which is all way stop controlled. There were 22 crashes over the five year study period which is higher than expected for this type of ramp intersection (unsignalized 2-lane mainline, LOSS IV). **Figure 3E** shows the accident distribution by accident type for the I-76 eastbound ramp termini with Bromley Lane. The majority of crashes were rear end collisions (55 percent). Another common crash at this location were broadside collisions (27 percent).

Figure 3E



Most of the rear end crashes were caused by vehicles traveling along the eastbound off-ramp (8 of 12 crashes). Many of vehicles were attempting to turn left onto westbound Bromley. There a channelized left turn lane for the eastbound off ramp traffic at this intersection (**Figures 3F and 3G**) which may be confusing to some drivers. There were two instances where vehicles backed into the vehicles behind them as a result of not initially recognizing the dedicated channelized left turn lane as they entered the intersection. Placing additional delineation or signing on the median island separating the I-76 eastbound off ramp movements may help guide drivers as they approach the intersection.

Figure 3F

I-76 EB Off Ramp at Bromley Lane (Aerial View)



Figure 3G

I-76 EB Off Ramp at Bromley Lane (Street View)



Broadside crashes were split equally between I-76 eastbound off ramp and eastbound Bromley Lane traffic failing to yield right of way at a stop sign. Similar to the westbound ramp termini, the ramp intersection is slightly skewed. With the channelized left turn from the ramp, the stop sign placement to be further back for the eastbound I-76 off ramp and eastbound Bromley approaches.

Altering the geometric configuration of the ramp termini into a right angle or construction of a roundabout may help reduce these types of crashes. However, intersection reconfiguration may be outside the scope of a new interchange project at Bridge St and could be considered as part of a separate safety improvement project.

I-76 and Baseline Rd / 168th Ave Interchange Analysis

As seen in **Figure 4**, the I-76 and Bromley Lane interchange is a standard diamond interchange. There were four accidents along the ramps and cross streets within this interchange area over the five year study period. **Table 3** breaks it down by section. No crash patterns were detected. There are no suggestions for improvement at this time.

Figure 4
I-76 and Baseline Rd Interchange



Table 3: I-76 and Baseline Rd / 168th Ave Interchange Accident Totals by Section

Section	Number of Accidents			Total
	Property Damage Only	Evident Injury	Fatal	
I-76 WB Ramps / Baseline Rd	1	1	0	2
I-76 WB Off Ramp	1	0	0	1
I-76 WB On Ramp	1	0	0	1
Total	3	1	0	4

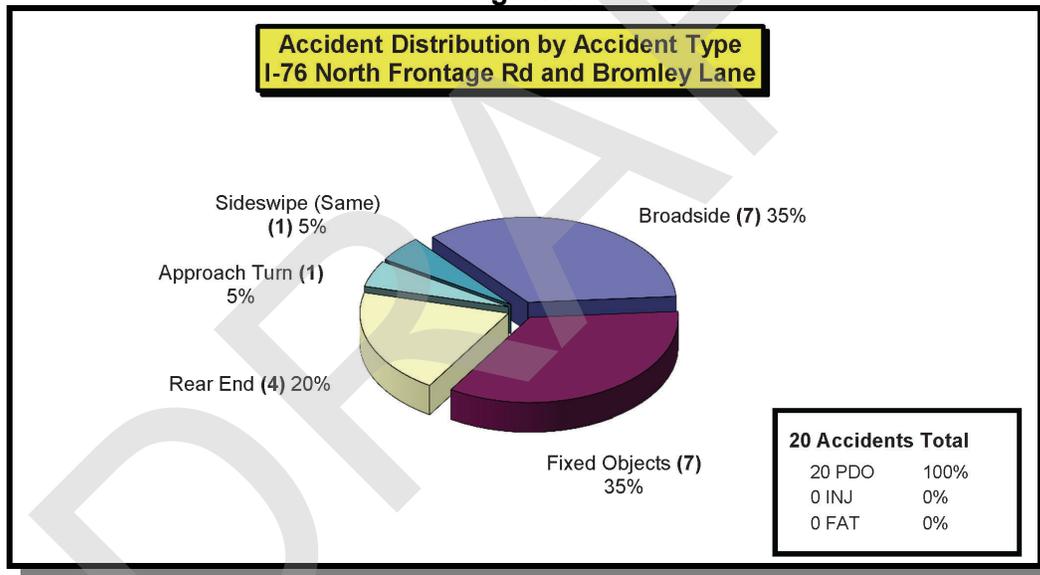
I-76 North Frontage Rd Analysis

Table 4: I-76 North Frontage Rd Accident Totals by Section

Intersection	Number of Accidents			
	Property Damage Only	Evident Injury	Fatal	Total
Bromley Lane	20	0	0	20
50th Ave	9	1	0	10
Longspur Dr	0	1	0	1
Bridge St	1	0	0	1
Baseline Rd	11	0	0	11
Non-Intersection Related	9	2	0	11
Total	50	4	0	54

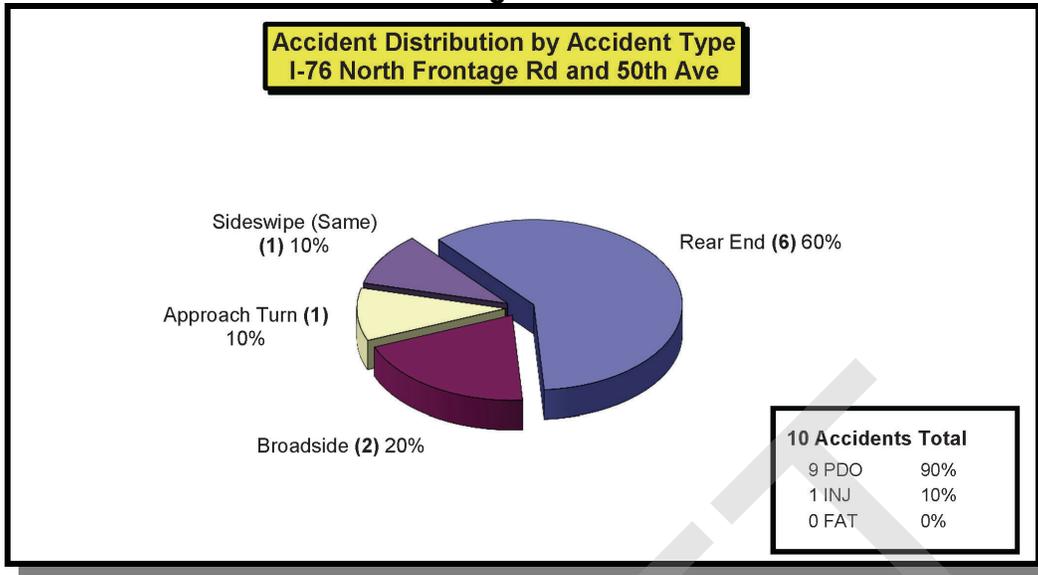
- Accident frequency at Bromley Lane higher than expected (LOSS III).
- Accident frequency at 50th Ave higher than expected (LOSS IV).
- Accident frequency at Baseline Rd higher than expected (LOSS III / LOSS IV).

Figure 5A



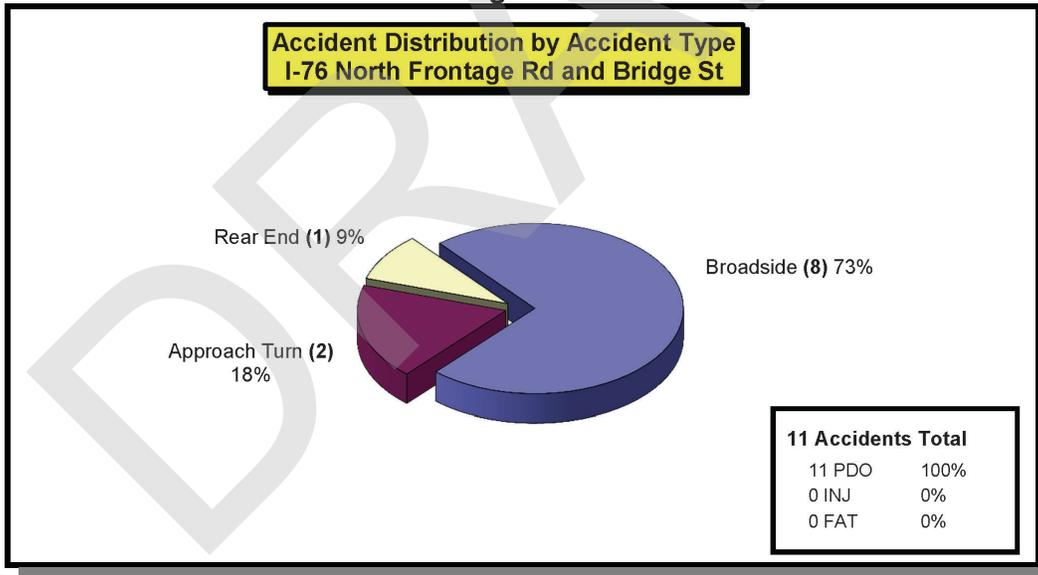
- Roundabout completed by late 2009 (8 crashes before, 12 crashes after).
- 6 of 7 Fixed Object collisions were with signs.
- Most broadsides occurred before roundabout, all fixed object collisions happened after roundabout was built.
- May need more years of crash data to assess effectiveness of roundabout.

Figure 5B



- All rear ends and broadsides initiated by vehicles from southbound 50th Ave approach.
- Southbound acceleration lane on frontage rd may help reduce rear end crashes.

Figure 5C



- Broadside pattern, mostly from southbound frontage rd approach (6 of 8) failing to yield right of way at stop sign.
- Intersection slightly skewed.

Altering the geometric configuration of the ramp termini into a right angle or construction of a roundabout may help reduce these types of crashes. However, intersection reconfiguration may be outside the scope of a new interchange project at Bridge St and could be considered as part of a separate safety improvement project.

I-76 South Frontage Rd Analysis

There were four accidents along the I-76 south frontage rd over the five year study period. No patterns were detected. There are no suggestions for improvement at this time.

Table 5: I-76 South Frontage Rd Accident Totals by Section

Intersection	Number of Accidents			Total
	Property Damage Only	Evident Injury	Fatal	
152nd Ave (Bromley Lane)	1	0	0	1
Bridge St	1	0	0	1
Non-Intersection Related	1	1	0	2
Total	3	1	0	4

Conclusions and Recommendations

These conclusions and recommendations are based on the analysis of five years of accident history, review of video log, and a field visit. The Region is advised to verify through field survey, the observations made in this report regarding physical features, roadside characteristics and traffic control devices.

There were 198 accidents reported along I-76 from MP 21.50 to 26.50 from January 1, 2008 to December 31, 2012, including the interchanges and frontage roads. There were 24 collisions that caused injuries and two that caused fatalities.

I-76 Mainline

The I-76 segment between MP 21.50 and Bromley Lane (MP 22.41) had an accident frequency that was near expected safety performance (LOSS II / LOSS III) when compared to other 4-lane urban freeways within Colorado. The segment between Bromley Lane and Baseline Rd (MP 25.15) had an accident frequency that was better than expected (LOSS II).

The segment between Baseline Rd and MP 26.50 had a better than expected safety performance and a low potential for accident reduction (LOSS I / LOSS II) when compared to other 4-lane rural interstates within Colorado.

Fixed object crashes (mostly cable rail and guard rail) and overturning vehicles were the most common accident type along mainline I-76 over the five year study period. Cable rail and guard rail along this corridor can prevent vehicles from crossing the median which would result in a more serious crash like a head-on or sideswipe opposite direction. Additional cable rail was installed between Bromley Ln and Baseline Rd in early 2013 for a safety improvement project. This area covers where a fatal head-on crossover collision occurred in 2010. The entire stretch of I-76 within the study segment now has median cable rail. Similarly, rumble strips were installed between Bromley Ln and Baseline Rd in early 2013. Shoulder strips (inside/outside) are now present along I-76 north of Bromley Ln. This should help reduce crashes caused by drivers asleep at the wheel as well as any potential drivers that are fatigued or driving under the influence of alcohol or drugs. The additional cable rail and rumble strips from the recent safety improvement project may serve to prevent or mitigate overturning vehicle crashes as well.

I-76 and Bromley Lane Interchange

The I-76 westbound ramp termini with Bromley Lane had 18 crashes over the five year study period which is higher than expected for this type of ramp intersection (LOSS IV). The I-76 eastbound ramp termini with Bromley Lane had 22 crashes over the five year study period which is also higher than expected (LOSS IV).

For both these locations, altering the geometric configuration of the ramp termini into a right angle or construction of a roundabout may help reduce these types of crashes. However, intersection reconfiguration may be outside the scope of a new interchange project at Bridge St and could be considered as part of a separate safety improvement project.

I-76 and Baseline Rd Interchange

No crash patterns were detected. There are no suggestions for improvement at this time.

I-76 North Frontage Rd

Accident frequency at Bromley Lane higher than expected (LOSS III).

- Roundabout completed by late 2009 (8 crashes before, 12 crashes after).
- 6 of 7 Fixed Object collisions were with signs.
- Most broadsides occurred before roundabout, all fixed object collisions happened after roundabout was built.
- May need more years of crash data to assess effectiveness of roundabout.

Accident frequency at 50th Ave higher than expected (LOSS IV).

- All rear ends and broadsides initiated by vehicles from southbound 50th Ave approach.
- Southbound acceleration lane on frontage rd may help reduce rear end crashes.

Accident frequency at Baseline Rd higher than expected (LOSS III / LOSS IV).

- Broadside pattern, mostly from southbound frontage rd approach (6 of 8) failing to yield right of way at stop sign.
- Intersection slightly skewed.
- Altering the geometric configuration of the ramp termini into a right angle or construction of a roundabout may help reduce these types of crashes. However, intersection reconfiguration may be outside the scope of a new interchange project at Bridge St and could be considered as part of a separate safety improvement project.

I-76 South Frontage Rd

No crash patterns were detected. There are no suggestions for improvement at this time.

Recommendations for the entire study section

- Good skid resistance and drainage of the roadway surface.
- Adjustment, repair, and upgrade of existing guardrail to meet current standards.
- Elimination of pavement edge drop-offs (Safety Edge Application).
- Superelevation and crown correction where required.
- Appropriate pavement markings, signing, and delineation.
- Appropriate advance warning signing of curves.
- Replace all button reflectors and guardrail reflectors to insure good nighttime and inclement weather (fog, snow, rain, etc.) delineation.



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Job #: 20130605164243

Highway: 76A **Begin:** 21.50 **End:** 26.50 **From:**01/01/2008 **To:**12/31/2012

Severity	Multi-Vehicle	Location
PDO: 172	One Vehicle: 70	On Road: 127 Off in Median: 2
INJ: 24 29 :Injured	Two Vehicles: 123	Off Road Left: 32 Private Property: 0
FAT: 2 2 :Killed	Three or More: 5	Off Road Right: 37 Unknown: 0
Total: 198	Unknown: 0	Off Road at Tee: 0
	Total: 198	Total: 198

Accident Type			
Overturning: 21	Road Maintenance Equipment: 0	Fence: 2	
Other Non Collision: 5	Domestic Animal: 1	Tree: 0	
School Age Peds: 0	Wild Animal: 5	Large Rocks or Boulder: 0	
Ped on Toy Motorized Vehicle: 0	Light/Utility Pole: 0	Railroad Crossing Equipment: 0	
Other Pedestrians: 0	Traffic Signal Pole: 0	Barricade: 0	
Head On: 2	Sign: 9	Wall/Building: 0	
Rear End: 55	Guard Rail: 14	Crash Cushion/Traffic Barrel: 0	
Broadside: 27	Cable Rail: 12	Mailbox: 0	
Approach Turn: 8	Concrete Highway Barrier: 0	Other Fixed Object: 0	
Overtaking Turn: 1	Bridge Structure: 0	Involving Other Object: 1	
Sideswipe (Same): 20	Vehicle Debris/Cargo: 2	Unknown: 0	
Sideswipe (Opposite): 2	Culvert/Headwall: 0	Total: 198	
Parked Motor Vehicle: 1	Embankment: 6	Total Fixed Objects: 47	
Railway Vehicle: 0	Curb: 0	Total Other Objects: 3	
Bicycle: 0	Delineator Post: 4		

Lighting Conditions	
Daylight: 136	
Dawn or Dusk: 10	
Dark - Lighted: 32	
Dark - Unlighted: 20	
Unknown: 0	
Total: 198	

Weather Conditions		
None: 168	Dust: 0	
Rain: 6	Wind: 3	
Snow/Sleet/Hail: 19	Unknown: 0	
Fog: 2		
Total: 198		

Road Description	
At Intersection: 73	
At Driveway Access: 0	
Intersection Related: 3	
Non Intersection: 100	
Alley Related: 0	
Roundabout: 11	
Ramp: 11	
Parking Lot: 0	
Unknown: 0	
Total: 198	

Road Conditions	
Dry: 161	
Wet: 9	
Muddy: 0	
Snowy: 3	
Icy: 16	
Slushy: 5	
Foreign Material: 0	
Dry w/Icy Road Treatment: 1	
Wet w/Icy Road Treatment: 0	
Snowy w/Icy Road Treatment: 0	
Icy w/Icy Road Treatment: 3	
Slushy w/Icy Road Treatment: 0	
Unknown: 0	
Total: 198	

Mainline/Ramps/Frontage Rds		
Mainline: 83		
Crossroad (Ramp A): 4		
Frontage Rd: 25		
Ramps		
B: 2	H: 0	
C: 2	I: 0	
D: 3	J: 0	
E: 4	K: 0	
F: 0	T: 0	
G: 0		
Intsrx Frontage/Ramps		
M: 31	N: 20	
O: 22	P: 2	
HOV Lanes: 0		
Uknwn: 0		
Total: 198		

Accident Rates	
PDO: 0.94	MVMT Total: 1.08
Injury: 0.13	MVMT
Fatal: 1.09	100 MVMT



**Colorado Department of Transportation
Safety and Traffic Engineering
Detailed Accident Summary Report**

Job #: 20130605164243

Highway: 76A **Begin:** 21.50 **End:** 26.50 **From:** 01/01/2008 **To:** 12/31/2012

Vehicle Types	Veh 1	Veh 2	Veh 3	Direction	Veh 1	Veh 2	Veh 3
Vehicle/Vehicle Combo (> 10k Lbs):	14	5	0	North:	20	13	0
School Bus (All School Busses):	0	0	0	Northeast:	9	4	0
Non-School Bus (> 8) in Commerce:	0	0	0	East:	69	40	2
Transit Bus:	0	0	0	Southeast:	0	0	0
Passenger Car/Van:	94	68	2	South:	36	20	0
Passenger Car/Van w/Trailer:	1	0	0	Southwest:	9	6	0
Pickup Truck/Utility Van:	41	21	1	West:	55	45	3
Pickup Truck/Utility Van w/Trailer:	3	4	0	Northwest:	0	0	0
SUV:	34	25	2	Unknown:	0	0	0
SUV w/Trailer:	2	1	0	Total:	198	128	5
Motor Home:	0	0	0				
Motorcycle:	3	2	0				
Bicycle:	0	0	0				
Motorized Bicycle:	0	0	0				
Farm Equipment:	0	0	0				
Hit and Run - Unknown:	5	0	0				
Light Rail:	0	0	0				
Other:	1	2	0				
Unknown:	0	0	0				
Commercial Vehicle	Total:	198	128	5			

Contributing Factor	Veh 1	Veh 2	Veh 3	Vehicle Movement	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	65	122	5	Going Straight:	103	65	2
Asleep at the Wheel:	7	1	0	Slowing:	8	4	1
Driver Fatigue:	2	0	0	Stopped in Traffic:	2	44	0
Illness/Medical:	2	0	0	Making Right Turn:	10	1	0
Driver Inexperience:	17	1	0	Making Left Turn:	21	6	0
Agressive Driving:	6	0	0	Making U-Turn:	1	0	0
Driver Unfamiliar with Area:	10	0	0	Passing:	1	0	0
Driver Emotionally Upset:	2	0	0	Backing:	4	0	0
Evading Law Enforcement Officer:	0	0	0	Enter/Leave Parked Pos:	0	0	0
Physical Disability:	0	0	0	Parked:	0	1	1
DUI, DWAI, DUID:	12	1	0	Changing Lanes:	10	0	0
Distracted/Passenger:	3	0	0	Avoiding Object in Road:	5	3	1
Distracted/Cell Phone:	5	0	0	Weaving:	4	0	0
Distracted/Radio:	0	0	0	Spun Out of Control:	20	2	0
Distracted/Other:	11	0	0	Drove Wrong Way:	2	0	0
Other Factor:	56	3	0	Other:	7	2	0
Unknown:	0	0	0	Unknown:	0	0	0
Total:	198	128	5	Total:	198	128	5

Driver Condition (Alcohol)	Veh 1	Veh 2	Veh 3	Driver Condition (Drugs)	Veh 1	Veh 2	Veh 3
No Alcohol Suspected:	164	126	5	No Drugs Suspected:	168	127	5
Alcohol Suspected:	12	1	0	Drugs Suspected:	4	0	0
Unknown Alcohol:	22	1	0	Unknown Drugs:	26	1	0
Alcohol Sub-Total:	198	128	5	Drugs Sub-Total:	198	128	5

ADT: 20,256 **Length:** 4.96 **Coris File:** tcoris2011.dbf

Hwy	MP	Description	R/U code	Functional Class	% Trucks	Adt	Adt year	County	Terrain	Lanes	Signalized	Divided
076A	21.59	CHANGE ROADWAY WIDTH	Urban	Interstate	15.3	31000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.00	MILEPOST 22 - SPEED LIMIT (45) - RAMP ON (FROM BROMLEY LN EB RAMP E) EXIT 22	Urban	Interstate	15.3	31000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.15	EXIT 22 - SIGN BRIDGE STR (E-17-ZH) EB (TEXT - BROMLEY LN)	Urban	Interstate	15.3	31000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.16	RAMP OFF - (TO BROMLEY LN EB RAMP B) EXIT 22	Urban	Interstate	15.3	31000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.41	BROMLEY LANE INTERCHANGE STR (E-17-MI) - RD E AND W UNDERPASS SEPARATION	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.62	RAMP OFF PAVEMENT GORE	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.74	RAMP OFF - (TO BROMLEY LN WB RAMP D) EXIT 22	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	22.80	RAMP ON - (FROM BROMLEY LN WB RAMP C) EXIT 22	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	23.00	MILEPOST 23	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	23.15	MAJOR STR (E-18-A) NB	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	23.42	MAJOR STR (E-18-B) W BURLINGTON DITCH	Urban	Interstate	15.3	20000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	23.71	INTERCHANGE STR (E-18-AO) SH 007D (BRIDGE ST - 160TH AVE) -- OVERPASS SEPARATION	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	24.00	MILEPOST 24	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	24.58	LEAVE BRIGHTON	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	24.87	RAMP ON - (EXIT 25 - FROM BASELINE RD RAMP E)	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	24.93	RAMP OFF - (TO 168TH AVE EB RAMP B) EXIT 25	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	25.00	MILEPOST 25	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	25.14	ADAMS/WELD COUNTY LINE - ENTER DISTRICT (1) - ENTER MAINTSECT (1) - ENTER LOCHBUJE CITY LIMITS - ENTER REGION (4)	Urban	Interstate	15.3	17000	2011	ADAMS	Rolling	4	FALSE	TRUE
076A	25.15	LOCHBUJE INTERCHANGE STR (E-18-AM) - RD E (BASELINE RD) - RD W (168TH AVE)	Rural	Interstate	17.2	17000	2011	WELD	Rolling	4	FALSE	TRUE
076A	25.38	RAMP OFF - (TO BASELINE RD WB RAMP D) EXIT 25	Rural	Interstate	17.2	17000	2011	WELD	Rolling	4	FALSE	TRUE
076A	25.49	RAMP ON - (FROM 168TH AVE WB RAMP C) EXIT 25	Rural	Interstate	17.2	17000	2011	WELD	Rolling	4	FALSE	TRUE
076A	25.50	RAMP ON NB - MAJOR STR (D-18-K) SEEP CANAL	Rural	Interstate	17.2	17000	2011	WELD	Rolling	4	FALSE	TRUE
076A	26.00	MILEPOST 26 - SPEED LIMIT (75)	Rural	Interstate	17.2	17000	2011	WELD	Rolling	4	FALSE	TRUE
076A	26.46	MAJOR STR (D-18-BN) - RD E AND W (CO RD 4) UNDERPASS SEPARATION	Rural	Interstate	17.2	17000	2011	WELD	Rolling	4	FALSE	TRUE

#	Hwy	MP	Date	Time	Sever-ity	Location	Road Description	# of Veh	Road Contour	Road Condition	Lighting	Weather	Ramp	Accident Type	Dir	Vehicle Type	Alcohol	Drugs	Human Factor	Speed	Vehicle Movement
1	076A	21.50	10/19/2008	04:28	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	OVERTURNING	W	PICKUP TRUCK/UTILITY VAN	N	N	DISTRACTED/CELL PHONE	065	SPUN OUT OF CONTROL
2	076A	21.61	11/19/2012	01:19	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	WILD ANIMAL	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
3	076A	21.71	4/19/2010	14:27	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	CABLE RAIL	W	PICKUP TRUCK/UTILITY VAN/WTRAILER	N	N	NONE APPARENT	045	GOING STRAIGHT
4	076A	21.81	10/13/2010	14:31	PDO	ON	NON-INTERSECTION	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	N	REAR END	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	010	STOPPED IN TRAFFIC
5	076A	21.86	11/23/2011	07:21	PDO	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	INVOLVING OTHER OBJECT	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	CHANGING LANES
6	076A	21.91	2/22/2010	07:32	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	NONE	N	REAR END	N	PASSENGER CAR/VAN	N	N	NONE APPARENT	060	SPUN OUT OF CONTROL
7	076A	21.91	8/22/2010	11:45	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	W	VEH COMBO (10,000 LBS AND OVER)	N	N	NONE APPARENT	010	GOING STRAIGHT
8	076A	21.91	10/22/2011	23:06	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	WILD ANIMAL	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	065	GOING STRAIGHT
9	076A	21.91	2/8/2010	07:27	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET/HAIL	N	CABLE RAIL	W	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	065	SPUN OUT OF CONTROL
10	076A	21.91	2/3/2011	17:20	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET/HAIL	N	CABLE RAIL	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	050	GOING STRAIGHT
11	076A	21.91	5/28/2011	11:13	INU	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	N	CABLE RAIL	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
12	076A	21.91	5/20/2009	17:02	PDO	ON	NON-INTERSECTION	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	N	Y (L)	SW	PASSENGER CAR/VAN	N	N	AGRESSIVE DRIVING	060	SPUN OUT OF CONTROL
13	076A	21.92	10/26/2012	06:03	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	ICY	DARK-UNLIGHTED	SNOW/SLEET/HAIL	N	SIDESWIPE (SAME DIRECTION)	W	PICKUP TRUCK/UTILITY VAN	N	N	AGRESSIVE DRIVING	050	SPUN OUT OF CONTROL
14	076A	21.98	8/10/2011	14:46	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	N	OVERTURNING	W	PASSENGER CAR/VAN	N	N	AGRESSIVE DRIVING	075	GOING STRAIGHT
15	076A	22.00	3/19/2011	06:24	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	Y	Y	DUI, DWAI, DUID	070	WEAVING
16	076A	22.00	5/10/2012	16:59	INU	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	W	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER INEXPERIENCE	075	CHANGING LANES
17	076A	22.00	9/30/2011	06:03	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	GUARD RAIL	E	PICKUP TRUCK/UTILITY VAN	N	N	ILLNESS/MEDICAL	075	GOING STRAIGHT
18	076A	22.01	5/24/2008	10:51	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	W	VEH COMBO (10,000 LBS AND OVER)	N	N	NONE APPARENT	065	CHANGING LANES
19	076A	22.01	5/25/2011	12:00	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	CABLE RAIL	W	PASSENGER CAR/VAN	N	N	OTHER FACTOR	060	SLOWING
20	076A	22.02	4/1/2011	00:07	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	REAR END	W	SUV	N	N	ASLEEP AT THE WHEEL	075	GOING STRAIGHT
21	076A	22.07	8/19/2011	11:25	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	FENCE	E	PASSENGER CAR/VAN	N	N	DISTRACTED/OTHER	075	GOING STRAIGHT
22	076A	22.11	12/18/2008	12:21	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	NONE	N	OTHER NON-COLLISION	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	CHANGING LANES
23	076A	22.11	6/18/2009	01:32	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	WILD ANIMAL	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
24	076A	22.11	1/30/2009	19:15	PDO	OFF LEFT	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	CABLE RAIL	E	SUV	N	N	NONE APPARENT	080	OTHER
25	076A	22.11	3/12/2009	03:19	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	CABLE RAIL	E	SUV	N	N	ASLEEP AT THE WHEEL	075	GOING STRAIGHT
26	076A	22.11	10/4/2009	15:04	INU	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	WIND	N	CABLE RAIL	E	PASSENGER CAR/VAN	N	N	DRIVER EMOTIONALLY UPSET	040	OTHER
27	076A	22.11	12/31/2010	13:11	PDO	OFF LEFT	NON-INTERSECTION	4	STRAIGHT ON-LEVEL	SLUSHY	DAYLIGHT	NONE	N	CABLE RAIL	W	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	065	SPUN OUT OF CONTROL
28	076A	22.16	3/12/2012	14:08	INU	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OVERTURNING	W	SUV	N	N	DISTRACTED/OTHER	75	SPUN OUT OF CONTROL
29	076A	22.17	2/4/2008	16:14	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY/W/IS ICY ROAD TREATMENT	DAYLIGHT	SNOW/SLEET/HAIL	N	DELINATOR POST	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	050	GOING STRAIGHT
30	076A	22.21	6/11/2011	21:37	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	CABLE RAIL	W	PASSENGER CAR/VAN	N	N	DRIVER FATIGUE	075	GOING STRAIGHT
31	076A	22.21	3/14/2010	14:39	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	DELINATOR POST	W	SUV	N	N	ASLEEP AT THE WHEEL	075	GOING STRAIGHT
32	076A	22.25	6/25/2010	03:44	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN/WTRAILER	N	N	OTHER FACTOR	060	AVOIDING OBJECT IN ROAD
33	076A	22.25	12/12/2010	21:42	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DARK-LIGHTED	NONE	N	WILD ANIMAL	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	050	AVOIDING OBJECT IN ROAD
34	076A	22.29	5/22/2008	09:23	PDO	OFF RIGHT	RAMP	1	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (E)	GUARD RAIL	W	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	030	SLOWING
35	076A	22.30	3/5/2008	07:35	PDO	OFF RIGHT	RAMP	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	NONE	Y (E)	EMBANKMENT	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	040	SPUN OUT OF CONTROL
36	076A	22.31	9/11/2008	21:07	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DARK-LIGHTED	RAIN	N	SIDESWIPE (SAME DIRECTION)	E	VEH COMBO (10,000 LBS AND OVER)	N	N	NONE APPARENT	075	CHANGING LANES
37	076A	22.32	12/23/2009	16:30	PDO	OFF LEFT	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET/HAIL	N	CABLE RAIL	W	VEH COMBO (10,000 LBS AND OVER)	N	N	OTHER FACTOR	050	AVOIDING OBJECT IN ROAD
38	076A	22.32	8/16/2012	02:24	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	CABLE RAIL	E	PASSENGER CAR/VAN	N	N	ASLEEP AT THE WHEEL	060	GOING STRAIGHT
39	076A	22.33	2/14/2008	07:22	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL	N	REAR END	W	PASSENGER CAR/VAN	N	N	OTHER FACTOR	030	SLOWING
40	076A	22.33	4/10/2012	16:01	INU	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	REAR END	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
41	076A	22.37	2/25/2009	14:44	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	PASSING
42	076A	22.37	3/22/2011	21:52	INU	OFF LEFT	RAMP	1	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE	Y (B)	GUARD RAIL	E	PASSENGER CAR/VAN	Y	N	DUI, DWAI, DUID	065	GOING STRAIGHT
43	076A	22.39	3/6/2012	16:48	PDO	ON	NON-INTERSECTION	2	HILLCREST	DRY	DARK-UNLIGHTED	NONE	N	REAR END	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	035	GOING STRAIGHT
44	076A	22.39	1/31/2011	06:16	PDO	ON	RAMP	2	STRAIGHT ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL	N	REAR END	E	SUV	N	N	DRIVER UNFAMILIAR W/AREA	040	GOING STRAIGHT
45	076A	22.39	2/24/2011	07:21	PDO	ON	RAMP	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (E)	REAR END	SW	PASSENGER CAR/VAN	N	N	NONE APPARENT	005	GOING STRAIGHT
46	076A	22.39	4/19/2011	07:09	PDO	ON	RAMP	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (E)	SIDESWIPE (SAME DIRECTION)	SW	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER UNFAMILIAR W/AREA	010	GOING STRAIGHT
47	076A	22.40	2/4/2008	15:41	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY/W/IS ICY ROAD TREATMENT	DAYLIGHT	SNOW/SLEET/HAIL	N	GUARD RAIL	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	040	GOING STRAIGHT
48	076A	22.41	7/2/2008	05:33	INU	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	N	GUARD RAIL	W	PICKUP TRUCK/UTILITY VAN	N	N	DISTRACTED/OTHER	070	WEAVING
49	076A	22.41	10/28/2009	05:39	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL	N	GUARD RAIL	E	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	050	AVOIDING OBJECT IN ROAD
50	076A	22.41	7/2/2012	12:26	PDO	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	VEHICLE DEBRIS OR CARGO	W	OTHER - SEE REPORT	N	N	OTHER FACTOR	075	GOING STRAIGHT

#	Hwy	MP	Date	Time	Sever-ity	Location	Road Description	# of Veh	Road Contour	Road Condition	Lighting	Weather	Ramp	Accident Type	Dir	Vehicle Type	Alcohol	Drugs	Human Factor	Speed	Vehicle Movement
81	076A	22.41	4/18/2011	0721	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (A)	REAR END	W	SUV	N	N	DISTRACTED/PASSING	020	GOING STRAIGHT
82	076A	22.41	6/19/2009	1904	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (A)	SIDESWIPE (SAME DIRECTION)	E	SUV	N	N	DISTRACTED/CELL PHONE	035	CHANGING LANES
83	076A	22.41	4/28/2010	2116	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	WIND	Y (A)	VEHICLE DEBRIS OR CARGO	E	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	035	GOING STRAIGHT
84	076A	22.41	3/25/2011	1038	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (A)	REAR END	W	VEH COMBO (10,000 LBS AND OVER)	N	N	NONE APPARENT	025	OTHER
85	076A	22.41	11/13/2008	0756	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	REAR END	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	005	GOING STRAIGHT
86	076A	22.41	11/12/2009	0814	PDO	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	REAR END	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	030	GOING STRAIGHT
87	076A	22.41	1/8/2010	1304	PDO	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	SLUSHY	DAYLIGHT	NONE	Y (M)	REAR END	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	010	GOING STRAIGHT
88	076A	22.41	12/23/2010	1335	PDO	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	REAR END	E	VEH COMBO (10,000 LBS AND OVER)	N	N	OTHER FACTOR	005	GOING STRAIGHT
89	076A	22.41	1/10/2008	1544	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	OTHER FACTOR	020	GOING STRAIGHT
90	076A	22.41	1/13/2008	1650	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	005	MAKING LEFT TURN
91	076A	22.41	12/19/2008	1028	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	NONE	Y (M)	BROADSIDE	N	PASSENGER CAR/VAN	N	N	DRIVER UNFAMILIAR	020	GOING STRAIGHT
92	076A	22.41	4/19/2009	0822	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	APPROACH TURN	E	SUV	N	N	NONE APPARENT	035	MAKING LEFT TURN
93	076A	22.41	5/17/2009	0631	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	HT & RUN - UNKNOWN	N	N	NONE APPARENT	025	GOING STRAIGHT
94	076A	22.41	8/7/2009	1454	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	020	MAKING LEFT TURN
95	076A	22.41	10/2/2009	1701	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	N	PASSENGER CAR/VAN	N	N	NONE APPARENT	015	GOING STRAIGHT
96	076A	22.41	6/4/2012	0145	PDO	ON	ROUNDABOUT	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	BROADSIDE	W	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	025	GOING STRAIGHT
97	076A	22.41	2/14/2012	2055	PDO	OFF RIGHT	ROUNDABOUT	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	SIGN	W	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	040	OTHER
98	076A	22.41	6/3/2012	0959	PDO	OFF RIGHT	ROUNDABOUT	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	SIGN	W	HT & RUN - UNKNOWN	N	N	AGGRESSIVE DRIVING	020	MAKING LEFT TURN
99	076A	22.41	10/10/2012	0517	PDO	OFF LEFT	ROUNDABOUT	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	SIGN	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	030	OTHER
100	076A	22.41	11/14/2011	0004	PDO	OFF RIGHT	ROUNDABOUT	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	GUARD RAIL	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	035	GOING STRAIGHT
101	076A	22.41	5/15/2010	0622	PDO	OFF RIGHT	ROUNDABOUT	1	CURVE ON-LEVEL	WET	DARK-LIGHTED	RAIN	Y (M)	SIGN	E	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER UNFAMILIAR W/AREA	045	GOING STRAIGHT
102	076A	22.41	10/21/2010	1920	PDO	OFF LEFT	ROUNDABOUT	2	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	SIGN	E	PASSENGER CAR/VAN	N	N	ASLEEP AT THE WHEEL	040	OTHER
103	076A	22.41	10/20/2010	1932	PDO	OFF RIGHT	ROUNDABOUT	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	SIGN	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	025	GOING STRAIGHT
104	076A	22.41	5/19/2008	1147	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	OTHER FACTOR	005	GOING STRAIGHT
105	076A	22.41	7/11/2008	1405	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	005	SLOWING
106	076A	22.41	9/10/2008	0759	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	015	MAKING RIGHT TURN
107	076A	22.41	11/15/2008	1053	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	010	MAKING RIGHT TURN
108	076A	22.41	11/16/2008	1127	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	020	GOING STRAIGHT
109	076A	22.41	6/24/2009	1425	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	005	MAKING RIGHT TURN
110	076A	22.41	7/28/2009	1627	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	DISTRACTED/OTHER	035	GOING STRAIGHT
111	076A	22.41	3/22/2010	1746	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	W	PASSENGER CAR/VAN	N	N	DUI, DWAI, DUID	035	GOING STRAIGHT
112	076A	22.41	4/30/2010	1811	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	DUI, DWAI, DUID	010	GOING STRAIGHT
113	076A	22.41	5/5/2010	1635	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	005	SLOWING
114	076A	22.41	6/16/2011	0813	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	SUV	N	N	OTHER FACTOR	005	MAKING RIGHT TURN
115	076A	22.41	1/5/2012	0806	PDO	ON	AT INTERSECTION	2	HILLCREST	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PASSENGER CAR/VAN	N	N	OTHER FACTOR	15	MAKING RIGHT TURN
116	076A	22.41	2/16/2012	1045	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	SUV	N	N	OTHER FACTOR	006	GOING STRAIGHT
117	076A	22.41	6/17/2012	1756	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (N)	REAR END	S	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	010	MAKING RIGHT TURN
118	076A	22.41	10/7/2008	0718	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	OTHER FACTOR	015	MAKING LEFT TURN
119	076A	22.41	7/8/2009	0918	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	APPROACH TURN	W	VEH COMBO (10,000 LBS AND OVER)	N	N	NONE APPARENT	010	MAKING LEFT TURN
120	076A	22.41	2/7/2012	1618	INJ	ON	AT INTERSECTION	2	HILLCREST	DRY	DAYLIGHT	NONE	Y (N)	BROADSIDE	S	VEH COMBO (10,000 LBS AND OVER)	N	N	DRIVER UNFAMILIAR W/AREA	020	MAKING LEFT TURN
121	076A	22.41	10/6/2010	1622	PDO	ON	AT INTERSECTION	2	HILLCREST	DRY	DAYLIGHT	NONE	Y (N)	SIDESWIPE (SAME DIRECTION)	S	VEH COMBO (10,000 LBS AND OVER)	N	N	OTHER FACTOR	005	MAKING RIGHT TURN
122	076A	22.41	10/19/2012	1456	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (O)	APPROACH TURN	E	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	015	GOING STRAIGHT
123	076A	22.41	3/24/2008	1145	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (O)	REAR END	N	SUV	N	N	DISTRACTED/OTHER	003	GOING STRAIGHT
124	076A	22.41	6/9/2008	1922	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (O)	REAR END	N	PASSENGER CAR/VAN	N	N	DISTRACTED/OTHER	010	SLOWING
125	076A	22.41	11/25/2008	0808	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (O)	REAR END	N	PASSENGER CAR/VAN	N	N	OTHER FACTOR	005	GOING STRAIGHT
126	076A	22.41	10/21/2009	0800	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	Y (O)	REAR END	N	SUV	N	N	NONE APPARENT	005	GOING STRAIGHT
127	076A	22.41	11/25/2009	2023	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DARK-LIGHTED	NONE	Y (O)	REAR END	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	030	GOING STRAIGHT
128	076A	22.41	12/24/2009	0605	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DARK-LIGHTED	SNOW/SLEET/HAUL	Y (O)	REAR END	N	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	005	SPUN OUT OF CONTROL
129	076A	22.41	4/6/2010	1507	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	REAR END	E	PASSENGER CAR/VAN	N	N	DISTRACTED/CELL PHONE	005	GOING STRAIGHT
130	076A	22.41	4/21/2011	1219	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (O)	REAR END	N	PASSENGER CAR/VAN	N	N	OTHER FACTOR	015	BACKING
131	076A	22.41	9/13/2011	0768	PDO	ON	AT INTERSECTION	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	REAR END	N	SUV	N	N	OTHER FACTOR	010	GOING STRAIGHT
132	076A	22.41	4/4/2012	1310	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	REAR END	N	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	05	BACKING
133	076A	22.41	6/23/2012	2353	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (O)	REAR END	E	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	030	GOING STRAIGHT
134	076A	22.41	12/19/2012	0654	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET/HAUL	Y (O)	REAR END	N	SUV	N	N	NONE APPARENT	020	SLOWING
135	076A	22.41	1/31/2008	1541	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	BROADSIDE	N	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	010	MAKING LEFT TURN
136	076A	22.41	3/13/2008	1824	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAWN OR DUSK	NONE	Y (O)	BROADSIDE	E	VEH COMBO (10,000 LBS AND OVER)	N	N	OTHER FACTOR	020	GOING STRAIGHT
137	076A	22.41	5/9/2008	0756	PDO	ON	AT INTERSECTION	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	BROADSIDE	N	PASSENGER CAR/VAN	N	N	NONE APPARENT	010	MAKING LEFT TURN
138	076A	22.41	11/21/2008	1459	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	BROADSIDE	E	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	020	GOING STRAIGHT
139	076A	22.41	1/12/2010	1822	PDO	ON	AT INTERSECTION	2	HILLCREST	DRY	DARK-LIGHTED	NONE	Y (O)	BROADSIDE	N	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	015	MAKING LEFT TURN
140	076A	22.41	12/24/2010																		

#	Hwy	MP	Date	Time	Sever-ity	Location	Road Description	# of Veh	Road Contour	Road Condition	Lighting	Weather	Ramp	Accident Type	Dir	Vehicle Type	Alcohol	Drugs	Human Factor	Speed	Vehicle Movement
111	076A	22.41	2/25/2011	1607	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (O)	APPROACH TURN	E	PICKUP TRUCK/UTILITY	N	N	DISTRACTED/CELL PHONE	005	MAKING LEFT TURN
112	076A	22.41	12/9/2011	0606	PDO	OFF LEFT	AT INTERSECTION	1	STRAIGHT ON-LEVEL	WET	DARK-UNLIGHTED	FOG	Y (O)	GUARD RAIL	N	PASSENGER CAR/VAN	N	N	OTHER FACTOR	035	GOING LEFT TURN
113	076A	22.41	3/29/2012	1851	PDO	OFF LEFT	AT INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	Y (O)	GUARD RAIL	N	PASSENGER CAR/VAN VEH COMBO (10,000 LBS AND OVER)	N	N	OTHER FACTOR	10	MAKING LEFT TURN
114	076A	22.41	12/14/2010	1754	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE	Y (P)	REAR END	E	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	015	GOING STRAIGHT
115	076A	22.42	7/31/2008	2203	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DARK-LIGHTED	NONE	N	OTHER NON-COLLISION	E	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
116	076A	22.42	2/14/2010	1001	PDO	ON	RAMP	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	NONE	Y (D)	REAR END	W	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	020	GOING STRAIGHT
117	076A	22.43	3/20/2010	0203	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	ICY WAVERS ICY ROAD TREATMENT	DAWN OR DUSK	SNOW/SLEETHAIL	Y (L)	GUARD RAIL	SW	PASSENGER CAR/VAN	N	N	DRIVER UNFAMILIAR W/AREA	030	SPUN OUT OF CONTROL
118	076A	22.44	8/13/2010	0927	PDO	ON	RAMP	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (D)	REAR END	W	SUV	N	N	OTHER FACTOR	005	GOING STRAIGHT
119	076A	22.44	2/6/2008	1302	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	SIDESWIPE (SAME DIRECTION)	S	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	020	CHANGING LANES
120	076A	22.44	10/2/2011	1311	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	SLUSHY	DAYLIGHT	SNOW/SLEETHAIL	Y (L)	EMBAKMENT	SW	PASSENGER CAR/VAN	N	N	OTHER FACTOR	035	GOING STRAIGHT
121	076A	22.46	5/10/2010	1909	PDO	OFF RIGHT	NON-INTERSECTION	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	GUARD RAIL	NE	PASSENGER CAR/VAN	Y	N	DUI/DWAI DUID	030	GOING STRAIGHT
122	076A	22.49	9/22/2011	0649	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	OVERTAKING TURN	N	PASSENGER CAR/VAN	N	N	DRIVER EMOTIONALLY UPSET	015	MAKING L-TURN
123	076A	22.49	12/28/2012	1951	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	ICY	DARK-UNLIGHTED	NONE	Y (L)	SIGN	SW	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	045	GOING STRAIGHT
124	076A	22.52	7/11/2009	1042	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	REAR END	S	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	010	MAKING RIGHT TURN
125	076A	22.52	8/5/2009	0652	PDO	ON	AT INTERSECTION	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	Y (L)	REAR END	S	SUV	N	N	NONE APPARENT	010	MAKING RIGHT TURN
126	076A	22.52	5/31/2010	1349	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (L)	REAR END	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	010	GOING STRAIGHT
127	076A	22.52	11/10/2010	0815	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (L)	REAR END	S	SUV	N	N	OTHER FACTOR	005	GOING STRAIGHT
128	076A	22.52	10/27/2011	0716	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	REAR END	S	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	005	GOING STRAIGHT
129	076A	22.52	6/3/2012	0911	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (L)	REAR END	S	SUV	N	N	AGRESSIVE DRIVING	010	GOING STRAIGHT
130	076A	22.52	12/23/2008	1535	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (L)	BROADSIDE	S	SUV	N	N	NONE APPARENT	010	MAKING RIGHT TURN
131	076A	22.52	6/27/2012	1239	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	APPROACH TURN	NE	SUV	N	N	DRIVER INEXPERIENCE	010	MAKING LEFT TURN
132	076A	22.53	9/20/2012	1519	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	SIDESWIPE (SAME DIRECTION)	NE	PASSENGER CAR/VAN	N	N	NONE APPARENT	040	CHANGING LANES
133	076A	22.54	1/2/2009	1551	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	BROADSIDE	S	SUV	N	N	NONE APPARENT	020	MAKING LEFT TURN
134	076A	22.55	4/19/2010	1428	PDO	OFF RIGHT	RAMP	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (C)	PARKED MOTOR VEHICLE	E	PASSENGER CAR/VAN	N	N	DISTRACTED/OTHER	045	GOING STRAIGHT
135	076A	22.66	5/1/2008	1507	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	SLUSHY	DAYLIGHT	SNOW/SLEETHAIL	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	075	SPUN OUT OF CONTROL
136	076A	22.71	5/24/2010	1022	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	WIND	N	OVERTURNING	E	SUV	N	N	OTHER FACTOR	070	GOING STRAIGHT
137	076A	22.71	2/8/2010	2030	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	075	GOING STRAIGHT
138	076A	22.80	12/14/2010	1708	FAT	OFF DIVIDED HIGHWAY	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	N	HEAD ON	E	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	059	drove wrong way
139	076A	22.96	5/7/2009	1514	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	REAR END	NE	PASSENGER CAR/VAN	N	N	NONE APPARENT	045	GOING STRAIGHT
140	076A	23.00	5/21/2012	1313	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (L)	APPROACH TURN	NE	SUV	N	Y	NONE APPARENT	015	MAKING LEFT TURN
141	076A	23.00	4/16/2010	0613	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	N	SIGN	E	PASSENGER CAR/VAN	N	N	DRIVER UNFAMILIAR W/AREA	075	GOING STRAIGHT
142	076A	23.01	7/2/2009	0619	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	N	EMBAKMENT	W	SUV	N	N	OTHER FACTOR	070	WEAVING
143	076A	23.20	6/17/2010	2241	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER INEXPERIENCE	075	SPUN OUT OF CONTROL
144	076A	23.51	4/5/2010	1133	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OVERTURNING	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
145	076A	23.55	12/3/2011	1510	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	WET	DAYLIGHT	NONE	N	REAR END	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	065	GOING STRAIGHT
146	076A	23.56	10/2/2010	0131	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (L)	OVERTURNING	NE	PASSENGER CAR/VAN	Y	N	DUI/DWAI DUID	070	GOING STRAIGHT
147	076A	23.60	11/20/2010	0624	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	OVERTURNING	W	SUV W/TRAILER	N	N	DRIVER INEXPERIENCE	075	GOING STRAIGHT
148	076A	23.66	12/30/2010	2225	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	ICY	DARK-LIGHTED	SNOW/SLEETHAIL	N	OVERTURNING	W	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER UNFAMILIAR W/AREA	060	GOING STRAIGHT
149	076A	23.67	3/19/2009	1855	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAWN OR DUSK	NONE	Y (L)	OVERTURNING	NE	MOTORCYCLE	N	N	DRIVER UNFAMILIAR W/AREA	035	OTHER
150	076A	23.69	2/7/2012	0822	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEETHAIL	N	SIDESWIPE (SAME DIRECTION)	W	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	060	GOING STRAIGHT
151	076A	23.70	10/10/2009	0926	PDO	OFF DIVIDED HIGHWAY	NON-INTERSECTION	1	STRAIGHT ON-GRADE	ICY	DAYLIGHT	SNOW/SLEETHAIL	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	N	N	OTHER FACTOR	060	SPUN OUT OF CONTROL
152	076A	23.70	1/17/2010	1415	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	E	PASSENGER CAR/VAN	N	N	OTHER FACTOR	075	GOING STRAIGHT
153	076A	23.70	10/21/2012	0227	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	GUARD RAIL	E	PASSENGER CAR/VAN	N	N	ASLEEP AT THE WHEEL	075	GOING STRAIGHT
154	076A	23.71	9/15/2012	1507	PDO	ON	NON-INTERSECTION	3	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	N	REAR END	E	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER UNFAMILIAR W/AREA	045	GOING STRAIGHT
155	076A	23.71	12/7/2012	0035	INJ	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	GUARD RAIL	E	PASSENGER CAR/VAN	Y	N	DUI/DWAI DUID	075	SPUN OUT OF CONTROL
156	076A	23.71	9/12/2010	1647	PDO	ON	AT INTERSECTION	2	HILLCREST	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	040	STOPPED IN TRAFFIC
157	076A	23.71	5/18/2012	1819	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (P)	BROADSIDE	N	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	010	GOING STRAIGHT
158	076A	23.72	11/26/2010	2348	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DARK-LIGHTED	NONE	Y (L)	EMBAKMENT	SW	PICKUP TRUCK/UTILITY VAN	N	N	DUI/DWAI DUID	020	BACKING
159	076A	23.74	6/12/2011	2244	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (R)	OTHER NON-COLLISION	NE	SUV	N	N	NONE APPARENT	030	GOING STRAIGHT
160	076A	23.82	5/28/2010	1610	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OVERTURNING	W	SUV	N	N	OTHER FACTOR	076	GOING STRAIGHT

#	Hwy	MP	Date	Time	Sever-ity	Location	Road Description	# of Veh	Road Contour	Road Condition	Lighting	Weather	Ramp	Accident Type	Dir	Vehicle Type	Alcohol	Drugs	Human Factor	Speed	Vehicle Movement
161	076A	23.85	9/13/2012	0511	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	N	Y	DUI, DWAI, DUID	080	GOING STRAIGHT
162	076A	23.99	9/21/2010	1651	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (R)	OVERTURNING	SW	PICKUP TRUCK/UTILITY VAN	N	N	DRIVER INEXPERIENCE	065	GOING STRAIGHT
163	076A	24.00	5/21/2012	0615	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIDESWIPE (SAME DIRECTION)	W	VEH COMBO (10,001 LBS AND OVER)	N	N	OTHER FACTOR	070	CHANGING LANES
164	076A	24.00	7/22/2009	1717	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	N	REAR END	W	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	065	SPUN OUT OF CONTROL
165	076A	24.00	10/4/2012	0457	INJ	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	DOMESTIC ANIMAL	W	HIT & RUN - UNKNOWN	N	N	OTHER FACTOR	075	GOING STRAIGHT
166	076A	24.06	4/8/2008	0716	INJ	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	FOG	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	N	N	ILLNESS/MEDICAL	075	WEAVING
167	076A	24.09	11/8/2011	2043	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	WILD ANIMAL	W	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
168	076A	24.11	4/30/2011	0752	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OTHER NON-COLLISION	W	PASSENGER CAR/VAN	N	N	OTHER FACTOR	075	SPUN OUT OF CONTROL
169	076A	24.18	5/28/2008	1718	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OVERTURNING	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	075	GOING STRAIGHT
170	076A	24.32	8/30/2008	1900	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAWN OR DUSK	NONE	N	OVERTURNING	W	PASSENGER CAR/VAN	Y	N	NONE APPARENT	075	GOING STRAIGHT
171	076A	24.65	11/19/2010	1115	PDO	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	N	SIDESWIPE (SAME DIRECTION)	E	HIT & RUN - UNKNOWN	N	N	NONE APPARENT	075	AVOIDING OBJECT IN ROAD
172	076A	24.83	5/31/2009	1205	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	SIGN	W	SUV	N	N	DISTRACTED/PASSENGER	075	GOING STRAIGHT
173	076A	24.85	11/3/2011	0557	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	SIDESWIPE (SAME DIRECTION)	W	SUV	N	N	OTHER FACTOR	065	CHANGING LANES
174	076A	24.90	8/19/2011	1300	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OVERTURNING	E	PASSENGER CAR/VAN	N	N	ASLEEP AT THE WHEEL	075	GOING STRAIGHT
175	076A	25.15	1/15/2008	1635	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	N	PASSENGER CAR/VAN	N	N	DISTRACTED/PASSENGER	065	GOING STRAIGHT
176	076A	25.15	9/8/2009	0820	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	REAR END	S	SUV	N	N	DRIVER INEXPERIENCE	010	GOING STRAIGHT
177	076A	25.15	8/25/2008	0900	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	VEH COMBO (10,001 LBS AND OVER)	N	N	NONE APPARENT	UK	MAKING LEFT TURN
178	076A	25.15	9/4/2008	0735	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	OTHER FACTOR	005	MAKING LEFT TURN
179	076A	25.15	3/15/2009	1937	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	APPROACH TURN	W	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	030	MAKING LEFT TURN
180	076A	25.15	3/16/2009	1115	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	UK	MAKING LEFT TURN
181	076A	25.15	4/21/2009	1735	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PICKUP TRUCK/UTILITY VAN	N	N	NONE APPARENT	UK	GOING STRAIGHT
182	076A	25.15	5/4/2009	1615	PDO	ON	AT INTERSECTION	2	HILLCREST	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	NONE APPARENT	010	GOING STRAIGHT
183	076A	25.15	7/3/2009	2149	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DARK-LIGHTED	NONE	Y (M)	BROADSIDE	S	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	010	MAKING LEFT TURN
184	076A	25.15	8/27/2009	1435	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	Y (M)	BROADSIDE	N	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	UK	GOING STRAIGHT
185	076A	25.15	12/20/2008	2027	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	Y (M)	APPROACH TURN	W	HIT & RUN - UNKNOWN	N	N	DRIVER INEXPERIENCE	035	MAKING LEFT TURN
186	076A	25.15	2/20/2008	1425	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	REAR END	W	SUV	N	N	AGGRESSIVE DRIVING	045	GOING STRAIGHT
187	076A	25.15	6/24/2009	1910	INJ	OFF RIGHT	AT INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	Y (N)	DELINEATOR POST	S	MOTORCYCLE	N	N	DRIVER INEXPERIENCE	UK	SPUN OUT OF CONTROL
188	076A	25.20	4/20/2011	2252	PDO	OFF RIGHT	RAMP	1	STRAIGHT ON-GRADE	WET	DARK-LIGHTED	RAIN	Y (C)	DELINEATOR POST	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	005	BACKING
189	076A	25.20	1/1/2009	1622	PDO	OFF LEFT	RAMP	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	Y (D)	OVERTURNING	W	MOTORCYCLE	Y	N	DUI, DWAI, DUID	060	GOING STRAIGHT
190	076A	25.45	8/24/2008	2108	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	N	OVERTURNING	W	PASSENGER CAR/VAN	Y	Y	DUI, DWAI, DUID	075	SPUN OUT OF CONTROL
191	076A	25.50	3/20/2009	2015	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	N	HEAD ON	W	SUV	Y	N	DISTRACTED/CELL PHONE	075	GOING STRAIGHT
192	076A	25.50	4/17/2009	1756	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SLUSHY	DAYLIGHT	SNOW/SLEETHAIL	N	EMBANKMENT	E	PASSENGER CAR/VAN	N	N	NONE APPARENT	065	SPUN OUT OF CONTROL
193	076A	25.50	7/10/2009	1934	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	FENCE	E	PICKUP TRUCK/UTILITY VAN W/TRAILER	N	N	DISTRACTED/OTHER	065	GOING STRAIGHT
194	076A	25.53	1/11/2010	0840	FAT	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	REAR END	W	VEH COMBO (10,001 LBS AND OVER)	N	N	DISTRACTED/OTHER	070	GOING STRAIGHT
195	076A	25.60	11/30/2008	0650	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEETHAIL	N	GUARD RAIL	E	PASSENGER CAR/VAN	N	N	DISTRACTED/OTHER	065	GOING STRAIGHT
196	076A	26.00	6/29/2008	1650	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	N	OTHER NON-COLLISION	W	SUV W/TRAILER	N	N	OTHER FACTOR	065	GOING STRAIGHT
197	076A	26.00	7/24/2008	1802	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	N	SIDESWIPE (SAME DIRECTION)	W	PASSENGER CAR/VAN	N	N	DRIVER INEXPERIENCE	070	SPUN OUT OF CONTROL
198	076A	26.37	6/14/2008	0000	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DARK-UNLIGHTED	NONE	Y (L)	EMBANKMENT	NE	PASSENGER CAR/VAN	Y	N	DUI, DWAI, DUID	035	DROVE WRONG WAY



Appendix E
Part 1. HCS Reports

Due to volume constraints, available as a separate DVD.

Part 2.
Preliminary
Roundabout Operations
Analysis



Memorandum

August 27, 2013

To	David Sprague, PE – Atkins		
From	Troy Pankratz, PE – GHD, Inc. Amanda DeAmico – GHD, Inc.	Tel	(608) 216-2058
Subject	I-76 and Bridge Street Interchange Improvements Brighton, Colorado Preliminary Roundabout Operational Analysis	Job no.	28/10/128

OPERATIONAL ANALYSIS METHODOLOGY

A preliminary operational analysis was completed for the potential roundabouts to be located along Bridge Street at the proposed I-76 ramp terminals and the existing frontage road intersections in Brighton, Colorado. Three roundabout configuration alternatives were analyzed. Alternative 1 consists of four four-leg roundabouts, one at each of the proposed I-76 ramp terminals and one at each of the frontage road intersections. Alternative 2 consists of two six-leg roundabouts, one at each of the combined proposed I-76 ramp terminal and frontage road intersections. Alternative 3 consists of three roundabouts, one six-leg roundabout at the southbound ramp terminal, one four-leg roundabout at the northbound ramp terminal, and one four-leg roundabout at the East Frontage Road.

Build year 2019 and design year 2035 peak hour traffic volumes and truck percentages provided by Atkins were balanced between adjacent intersections and utilized to analyze the traffic operations for the potential roundabout alternatives. The balanced 2019 and 2035 peak hour traffic volumes and truck percentages for each alternative are shown in Figure 1 through Figure 5. A conceptual lane configuration for each alternative is shown in Figure 5 through Figure 8.

A preliminary analysis for each alternative was performed with the ARCADY model in Junctions 8 roundabout design and capacity analysis software. Preliminary geometric parameters were used with a 10% capacity reduction to correlate the results to recent U.S. observations and provide conservative results. In addition to the ARCADY analysis, a Highway Capacity Model (HCM) 2010 analysis was conducted in Junctions 8 to provide a comparison to the ARCADY results. The HCM roundabout capacity equations, which are dependent on critical and follow-up headways, are based on national averages; however, lower headways have been observed. Critical and follow-up headway values were adjusted in the HCM analyses to better reflect recent observations at U.S. roundabouts. Headway values used in the analysis are listed in Table 1.

Table 1. Adjusted Headway Values

# of Circulating (Conflicting) Lanes	Critical Headway (s)	Follow-up Headway (s)
One	4.2	2.8
Two	4.0	2.8

The results of the preliminary ARCADY and HCM analyses for each alternative are summarized in the following section and documented in Appendix A through Appendix F.

OPERATIONAL ANALYSIS RESULTS

Alternative 1: Four Roundabouts

2019 Build Year

The results of the ARCADY and HCM operational analyses for build year 2019 at the potential single-lane roundabouts to be located along Bridge Street are listed in Table 2 through Table 5. The results indicate that single-lane roundabouts at each of the four intersections will operate acceptably in the 2019 build year.

Table 2. West Frontage Road 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.4	A	N/A	6.7	A	N/A
	SB West Frontage Road	4.9	A	25	5.7	A	25
	EB Bridge Street	6.2	A	25	7.0	A	25
	NB West Frontage Road	4.4	A	25	4.5	A	25
	WB Bridge Street	6.7	A	25	6.8	A	25
HCM	Overall	7.7	A	N/A	8.1	A	N/A
	SB West Frontage Road	5.4	A	25	6.6	A	25
	EB Bridge Street	7.7	A	50	8.6	A	75
	NB West Frontage Road	4.8	A	25	4.9	A	25
	WB Bridge Street	8.1	A	75	8.2	A	75

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 3. I-76 Southbound Ramp Terminal 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	7.0	A	N/A	7.1	A	N/A
	SB I-76 Off Ramp	5.5	A	25	5.4	A	25
	EB Bridge Street	7.2	A	25	7.8	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	7.1	A	25	6.7	A	25
HCM	Overall	8.5	A	N/A	8.5	A	N/A
	SB I-76 Off Ramp	6.5	A	25	6.3	A	25
	EB Bridge Street	9.0	A	75	9.4	A	75
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	8.4	A	75	8.0	A	75

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 4. I-76 Northbound Ramp Terminal 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	5.9	A	N/A	6.6	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.6	A	25	3.9	A	25
	NB I-76 Off Ramp	6.4	A	25	7.7	A	25
	WB Bridge Street	6.1	A	25	6.2	A	25
HCM	Overall	7.4	A	N/A	8.3	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.7	A	25	4.3	A	25
	NB I-76 Off Ramp	8.1	A	75	9.9	A	75
	WB Bridge Street	7.7	A	25	7.9	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 5. East Frontage Road 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	4.2	A	N/A	3.9	A	N/A
	SB East Frontage Road	3.6	A	25	3.4	A	25
	EB Bridge Street	3.9	A	25	3.9	A	25
	NB East Frontage Road	3.8	A	25	3.6	A	25
	WB Bridge Street	4.6	A	25	4.2	A	25
HCM	Overall	4.6	A	N/A	4.3	A	N/A
	SB East Frontage Road	3.7	A	25	3.4	A	25
	EB Bridge Street	4.3	A	25	4.3	A	25
	NB East Frontage Road	3.8	A	25	3.9	A	25
	WB Bridge Street	5.2	A	25	4.5	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

2035 Design Year

The results of the ARCADY and HCM operational analyses for design year 2035 at the potential single-lane roundabouts to be located along Bridge Street are listed in Table 6 through Table 9. The results indicate that single-lane roundabouts at each of the four intersections will operate acceptably in the 2035 design year.

Table 6. West Frontage Road 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.6	A	N/A	8.6	A	N/A
	SB West Frontage Road	4.9	A	25	6.2	A	25
	EB Bridge Street	6.8	A	25	10.0	B	50
	NB West Frontage Road	4.6	A	25	5.1	A	25
	WB Bridge Street	6.7	A	25	7.7	A	25
HCM	Overall	8.0	A	N/A	10.1	B	N/A
	SB West Frontage Road	5.4	A	25	7.3	A	25
	EB Bridge Street	8.4	A	75	11.6	B	100
	NB West Frontage Road	5.0	A	25	5.7	A	25
	WB Bridge Street	8.1	A	75	9.3	A	100

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 7. I-76 Southbound Ramp Terminal 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	7.9	A	N/A	9.0	A	N/A
	SB I-76 Off Ramp	6.0	A	25	5.9	A	25
	EB Bridge Street	8.7	A	25	11.0	B	50
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	7.5	A	25	7.6	A	25
HCM	Overall	9.6	A	N/A	10.5	B	N/A
	SB I-76 Off Ramp	7.4	A	25	7.1	A	25
	EB Bridge Street	11.0	B	100	12.6	B	125
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	8.8	A	75	9.0	A	100

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 8. I-76 Northbound Ramp Terminal 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.4	A	N/A	7.8	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.6	A	25	3.9	A	25
	NB I-76 Off Ramp	6.9	A	25	9.4	A	25
	WB Bridge Street	6.4	A	25	6.8	A	25
HCM	Overall	8.0	A	N/A	9.8	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.8	A	25	4.4	A	25
	NB I-76 Off Ramp	8.7	A	75	11.9	B	125
	WB Bridge Street	8.3	A	50	8.8	A	50

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 9. East Frontage Road 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	4.2	A	N/A	4.0	A	N/A
	SB East Frontage Road	3.6	A	25	3.4	A	25
	EB Bridge Street	4.0	A	25	4.0	A	25
	NB East Frontage Road	3.8	A	25	3.7	A	25
	WB Bridge Street	4.6	A	25	4.2	A	25
HCM	Overall	4.7	A	N/A	4.4	A	N/A
	SB East Frontage Road	3.8	A	25	3.4	A	25
	EB Bridge Street	4.5	A	25	4.5	A	25
	NB East Frontage Road	3.8	A	25	4.0	A	25
	WB Bridge Street	5.2	A	25	4.5	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Alternative 2: Two Roundabouts

2019 Build Year

The results of the ARCADY and HCM operational analyses for build year 2019 at the potential single-lane roundabouts to be located along Bridge Street are listed in Table 10 and Table 11. The results indicate that single-lane roundabouts at both of the six-leg intersections will operate acceptably in the 2019 design year.

Table 10. I-76 Southbound Ramp Terminal 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.9	A	N/A	6.8	A	N/A
	SB I-76 Off Ramp	5.4	A	25	5.2	A	25
	SB West Frontage Road	5.2	A	25	5.8	A	25
	EB Bridge Street	7.1	A	25	7.5	A	25
	NB West Frontage Road	4.8	A	25	4.6	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	7.3	A	25	6.8	A	25
HCM	Overall	8.6	A	N/A	8.5	A	N/A
	SB I-76 Off Ramp	6.7	A	25	6.4	A	25
	SB West Frontage Road	6.2	A	25	7.2	A	25
	EB Bridge Street	9.4	A	75	9.6	A	75
	NB West Frontage Road	5.5	A	25	5.3	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	8.7	A	75	8.2	A	75

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 11. I-76 Northbound Ramp Terminal 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.0	A	N/A	6.5	A	N/A
	SB East Frontage Road	4.7	A	25	4.7	A	25
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.7	A	25	3.9	A	25
	NB I-76 Off Ramp	6.6	A	25	7.8	A	25
	NB East Frontage Road	4.8	A	25	5.1	A	25
	WB Bridge Street	6.1	A	25	6.0	A	25
HCM	Overall	7.6	A	N/A	8.3	A	N/A
	SB East Frontage Road	5.4	A	25	5.3	A	25
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.9	A	25	4.4	A	25
	NB I-76 Off Ramp	8.5	A	75	10.2	B	100
	NB East Frontage Road	5.4	A	25	6.3	A	25
	WB Bridge Street	8.0	A	25	7.5	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

2035 Design Year

The results of the ARCADY and HCM operational analyses for design year 2035 at the potential single-lane roundabouts to be located along Bridge Street are listed in Table 12 and Table 13. The results indicate that single-lane roundabouts at both of the six-leg intersections will operate acceptably in the 2035 design year.

Table 12. I-76 Southbound Ramp Terminal 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	7.6	A	N/A	9.3	A	N/A
	SB I-76 Off Ramp	5.8	A	25	5.9	A	25
	SB West Frontage Road	5.5	A	25	6.6	A	25
	EB Bridge Street	8.4	A	25	11.9	B	75
	NB West Frontage Road	5.1	A	25	5.4	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	7.6	A	25	8.1	A	25
HCM	Overall	9.5	A	N/A	11.4	B	N/A
	SB I-76 Off Ramp	7.5	A	25	7.4	A	25
	SB West Frontage Road	6.5	A	25	8.4	A	25
	EB Bridge Street	11.3	B	100	14.7	B	150
	NB West Frontage Road	6.0	A	25	6.4	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	9.0	A	75	9.7	A	100

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 13. I-76 Northbound Ramp Terminal 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.3	A	N/A	7.6	A	N/A
	SB East Frontage Road	4.7	A	25	4.9	A	25
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.7	A	25	4.0	A	25
	NB I-76 Off Ramp	7.1	A	25	9.5	A	25
	NB East Frontage Road	4.9	A	25	5.5	A	25
	WB Bridge Street	6.3	A	25	6.3	A	25
HCM	Overall	7.9	A	N/A	9.6	A	N/A
	SB East Frontage Road	5.5	A	25	5.6	A	25
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.9	A	25	4.5	A	25
	NB I-76 Off Ramp	9.0	A	75	12.1	B	125
	NB East Frontage Road	5.5	A	25	7.0	A	25
	WB Bridge Street	8.2	A	50	8.0	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Alternative 3: Three Roundabouts

2019 Build Year

The results of the ARCADY and HCM operational analyses for build year 2019 at the potential single-lane roundabouts to be located along Bridge Street are listed in Table 14 through Table 16. The results indicate that single-lane roundabouts at each of the four intersections will operate acceptably in the 2019 build year. The ARCADY and HCM operational analysis data for the I-76 southbound ramp terminal is documented in Appendix E. The ARCADY and HCM operational analysis data for the I-76 northbound ramp terminal and the East Frontage Road intersection is documented in Appendix C and Appendix D, respectively.

Table 14. I-76 Southbound Ramp Terminal 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.9	A	N/A	7.3	A	N/A
	SB I-76 Off Ramp	5.4	A	25	5.2	A	25
	SB West Frontage Road	5.2	A	25	7.1	A	25
	EB Bridge Street	7.1	A	25	8.6	A	25
	NB West Frontage Road	4.8	A	25	4.6	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	7.3	A	25	6.8	A	25
HCM	Overall	8.6	A	N/A	9.3	A	N/A
	SB I-76 Off Ramp	6.7	A	25	6.4	A	25
	SB West Frontage Road	6.2	A	25	9.6	A	50
	EB Bridge Street	9.4	A	75	11.4	B	75
	NB West Frontage Road	5.5	A	25	5.3	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	8.7	A	75	8.2	A	75

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 15. I-76 Northbound Ramp Terminal 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	5.9	A	N/A	6.6	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.6	A	25	3.9	A	25
	NB I-76 Off Ramp	6.4	A	25	7.7	A	25
	WB Bridge Street	6.1	A	25	6.2	A	25
HCM	Overall	7.4	A	N/A	8.3	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.7	A	25	4.3	A	25
	NB I-76 Off Ramp	8.1	A	75	9.9	A	75
	WB Bridge Street	7.7	A	25	7.9	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 16. East Frontage Road 2019 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	4.2	A	N/A	3.9	A	N/A
	SB East Frontage Road	3.6	A	25	3.4	A	25
	EB Bridge Street	3.9	A	25	3.9	A	25
	NB East Frontage Road	3.8	A	25	3.6	A	25
	WB Bridge Street	4.6	A	25	4.2	A	25
HCM	Overall	4.6	A	N/A	4.3	A	N/A
	SB East Frontage Road	3.7	A	25	3.4	A	25
	EB Bridge Street	4.3	A	25	4.3	A	25
	NB East Frontage Road	3.8	A	25	3.9	A	25
	WB Bridge Street	5.2	A	25	4.5	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

2035 Design Year

The results of the ARCADY and HCM operational analyses for design year 2035 at the potential single-lane roundabouts to be located along Bridge Street are listed in Table 17 through Table 19. The results indicate that single-lane roundabouts at each of the four intersections will operate acceptably in the 2035 design year. The ARCADY and HCM operational analysis data for the I-76 southbound ramp terminal is documented in Appendix E. The ARCADY and HCM operational analysis data for the I-76 northbound ramp terminal and the East Frontage Road intersection is documented in Appendix C and Appendix D, respectively.

Table 17. I-76 Southbound Ramp Terminal 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	7.6	A	N/A	9.3	A	N/A
	SB I-76 Off Ramp	5.8	A	25	5.9	A	25
	SB West Frontage Road	5.5	A	25	6.6	A	25
	EB Bridge Street	8.4	A	25	11.9	B	75
	NB West Frontage Road	5.1	A	25	5.4	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	7.6	A	25	8.1	A	25
HCM	Overall	9.5	A	N/A	11.4	B	N/A
	SB I-76 Off Ramp	7.5	A	25	7.4	A	25
	SB West Frontage Road	6.5	A	25	8.4	A	25
	EB Bridge Street	11.3	B	100	14.7	B	150
	NB West Frontage Road	6.0	A	25	6.4	A	25
	SB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	WB Bridge Street	9.0	A	75	9.7	A	100

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

Table 18. I-76 Northbound Ramp Terminal 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	6.4	A	N/A	7.8	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.6	A	25	3.9	A	25
	NB I-76 Off Ramp	6.9	A	25	9.4	A	25
	WB Bridge Street	6.4	A	25	6.8	A	25
HCM	Overall	8.0	A	N/A	9.8	A	N/A
	NB I-76 On Ramp	N/A	N/A	N/A	N/A	N/A	N/A
	EB Bridge Street	3.8	A	25	4.4	A	25
	NB I-76 Off Ramp	8.7	A	75	11.9	B	125
	WB Bridge Street	8.3	A	50	8.8	A	50

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

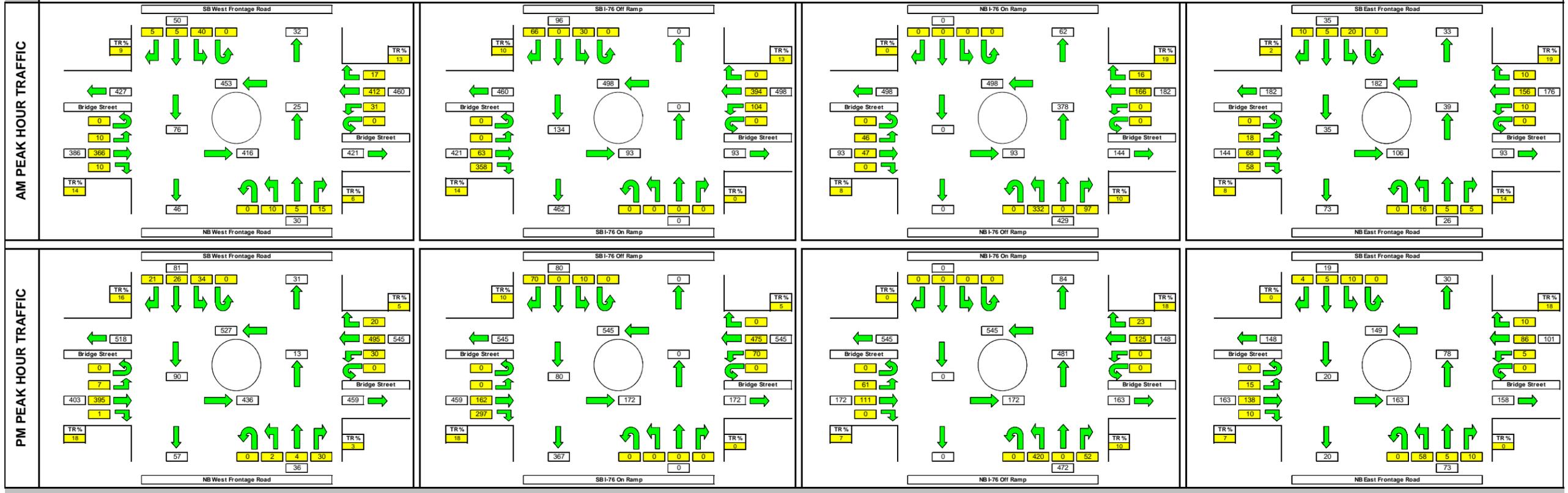
Table 19. East Frontage Road 2035 Preliminary Operational Analysis Summary

Model	Movement	AM Peak Period			PM Peak Period		
		Delay (s)	LOS ¹	Queue ² (ft)	Delay (s)	LOS ¹	Queue ² (ft)
ARCADY	Overall	4.2	A	N/A	4.0	A	N/A
	SB East Frontage Road	3.6	A	25	3.4	A	25
	EB Bridge Street	4.0	A	25	4.0	A	25
	NB East Frontage Road	3.8	A	25	3.7	A	25
	WB Bridge Street	4.6	A	25	4.2	A	25
HCM	Overall	4.7	A	N/A	4.4	A	N/A
	SB East Frontage Road	3.8	A	25	3.4	A	25
	EB Bridge Street	4.5	A	25	4.5	A	25
	NB East Frontage Road	3.8	A	25	4.0	A	25
	WB Bridge Street	5.2	A	25	4.5	A	25

¹ LOS Source: 2010 Highway Capacity Manual – Unsignalized Intersections

² Queue represents maximum 95th percentile lane queue

2019 BUILD YEAR - ALTERNATIVE 1



2035 DESIGN YEAR - ALTERNATIVE 1

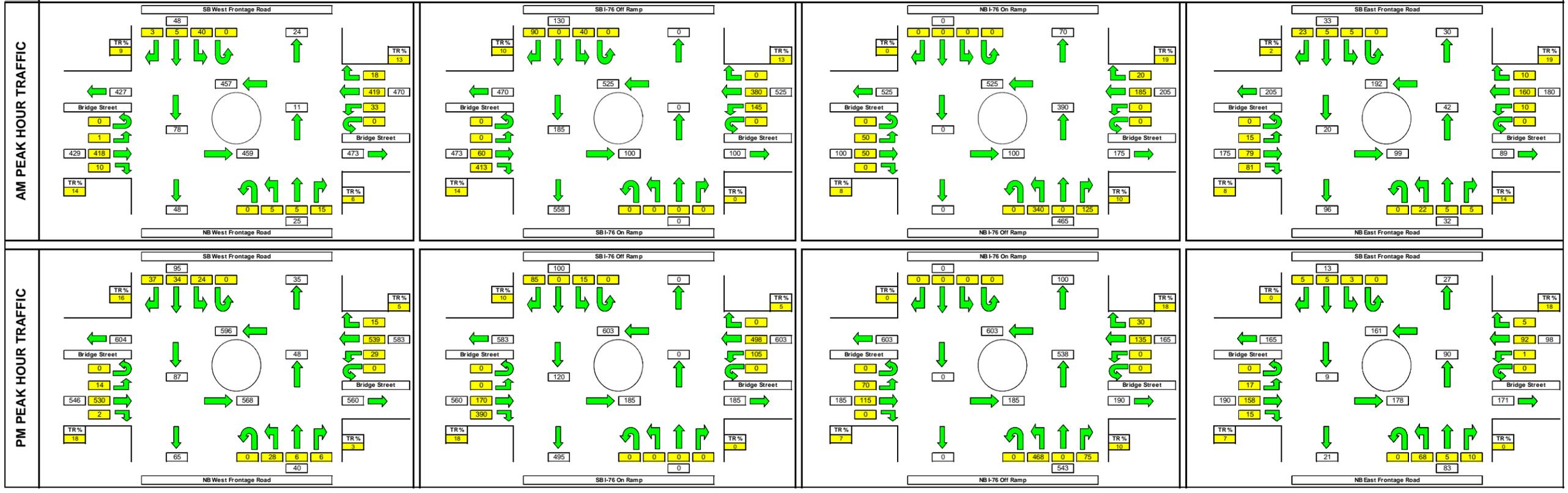
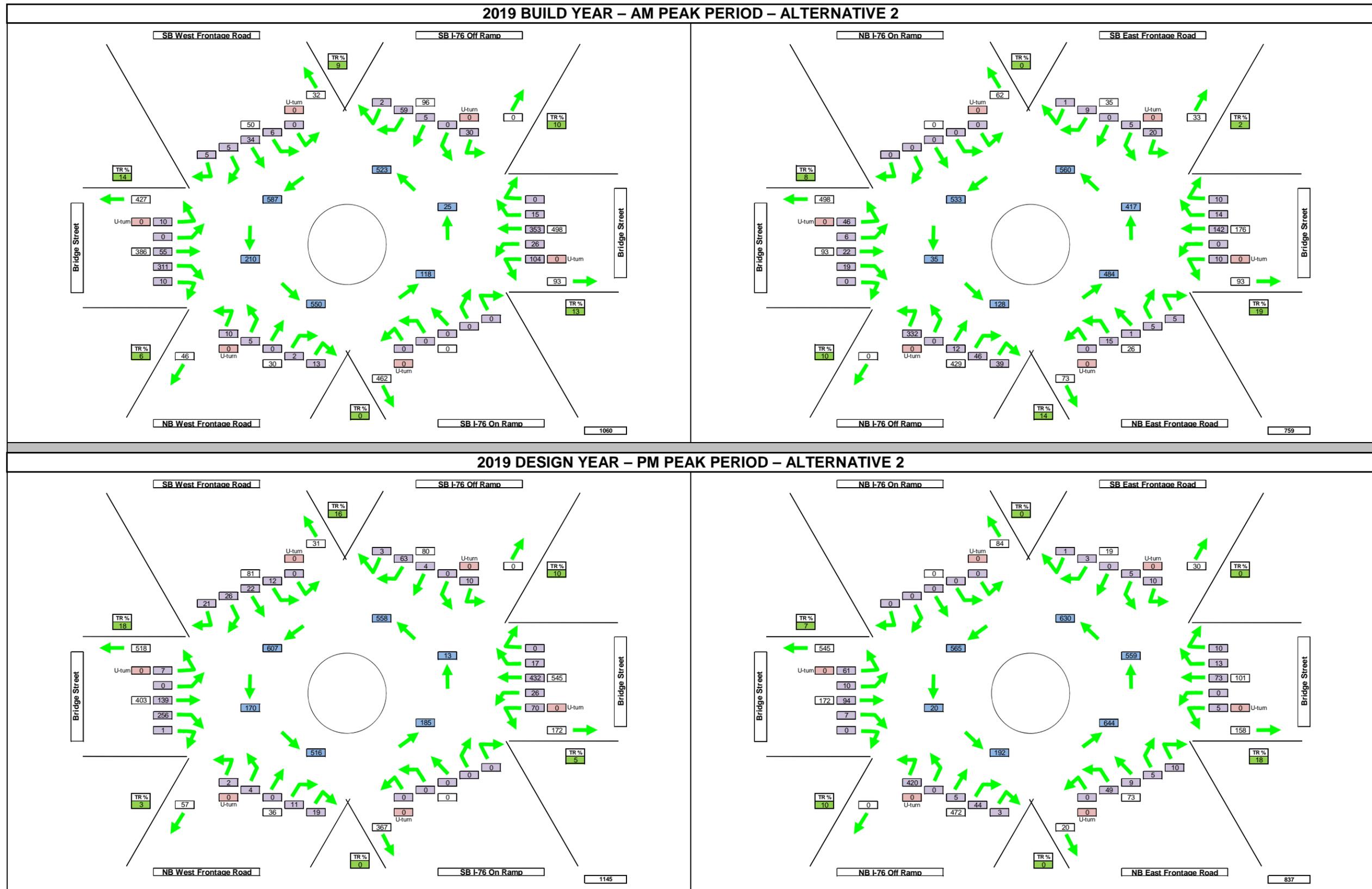


Figure 1. Alternative 1 Peak Hour Traffic Volumes, 2019 and 2035



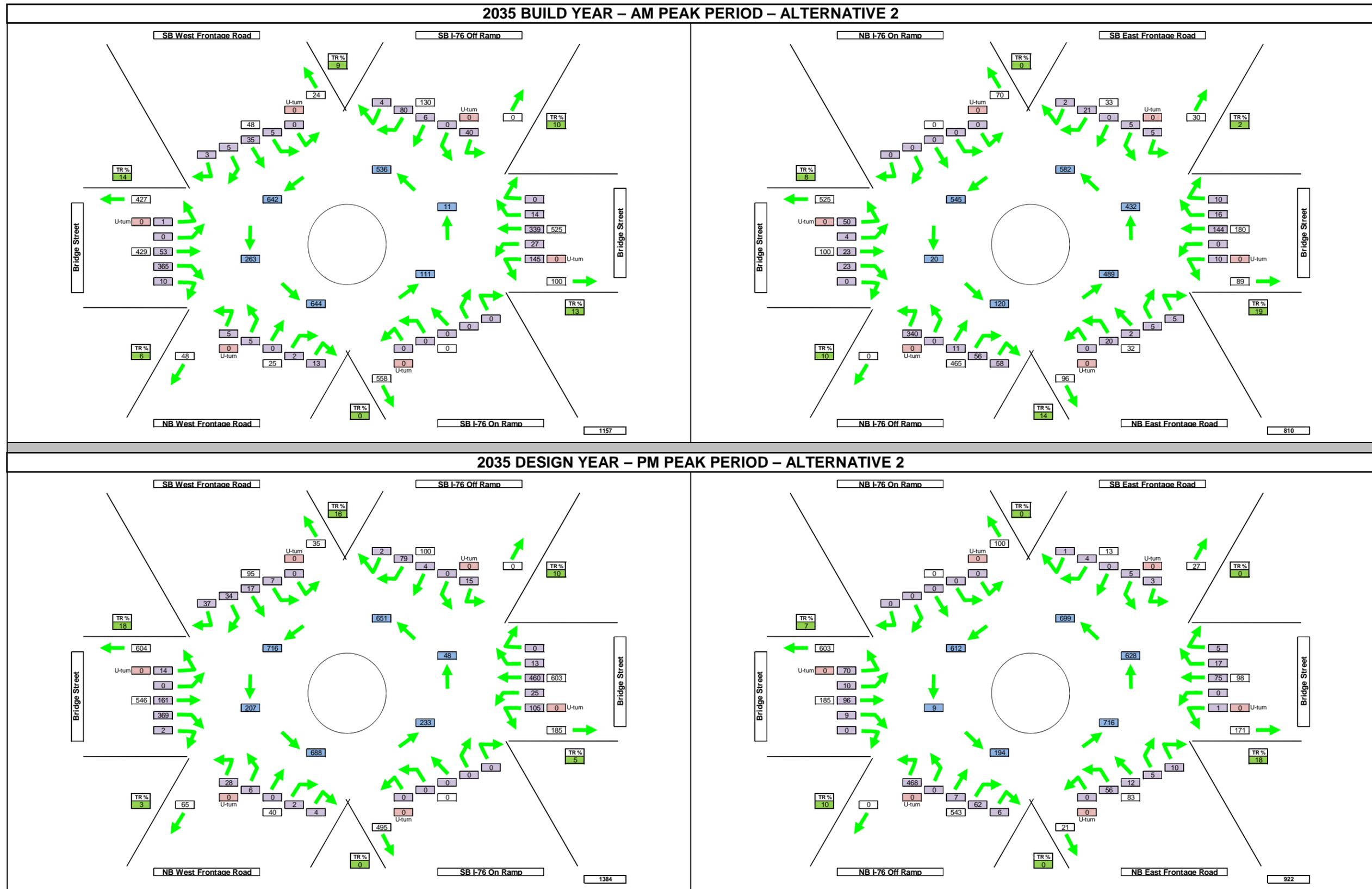


Figure 3. Alternative 2 Peak Hour Traffic Volumes, 2035

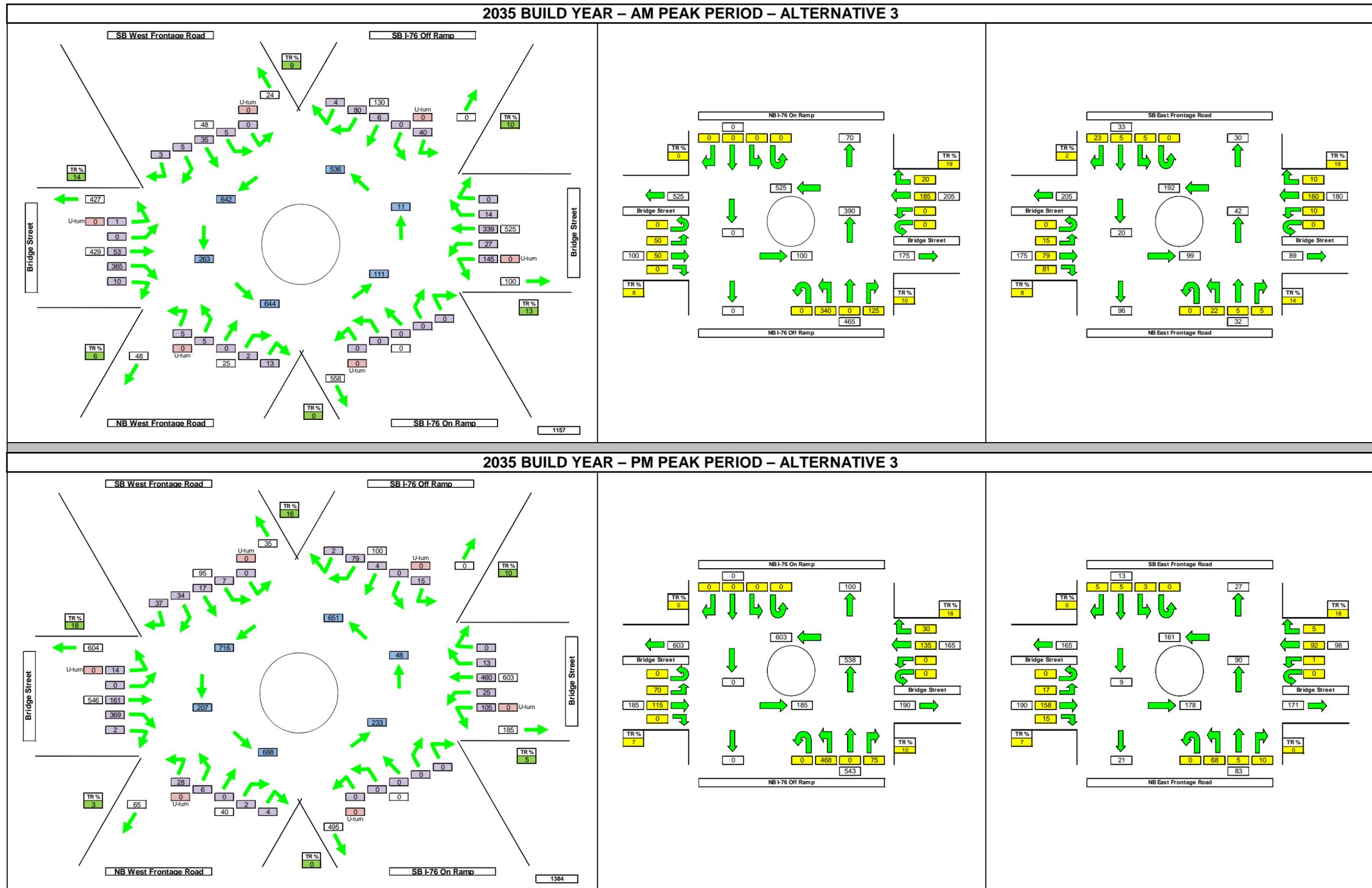


Figure 5. Alternative 3 Peak Hour Traffic Volumes, 2035

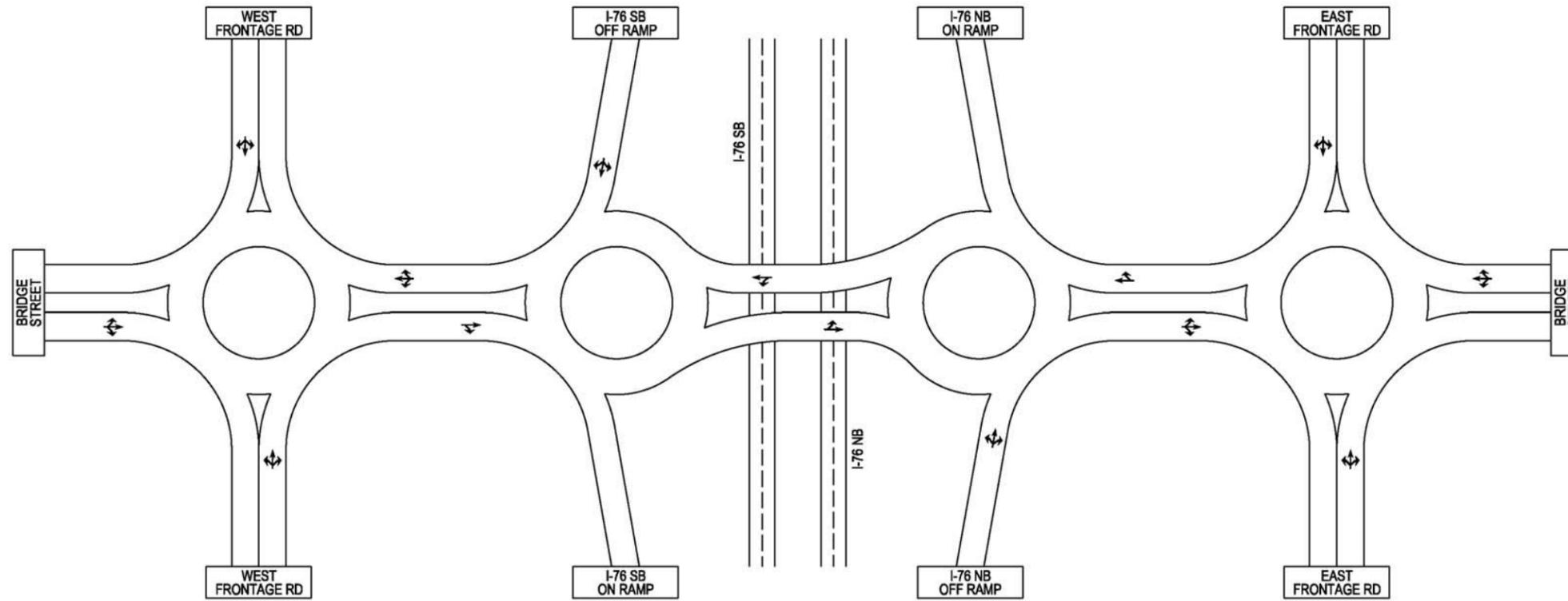


Figure 6. Alternative 1 Conceptual Lane Configuration

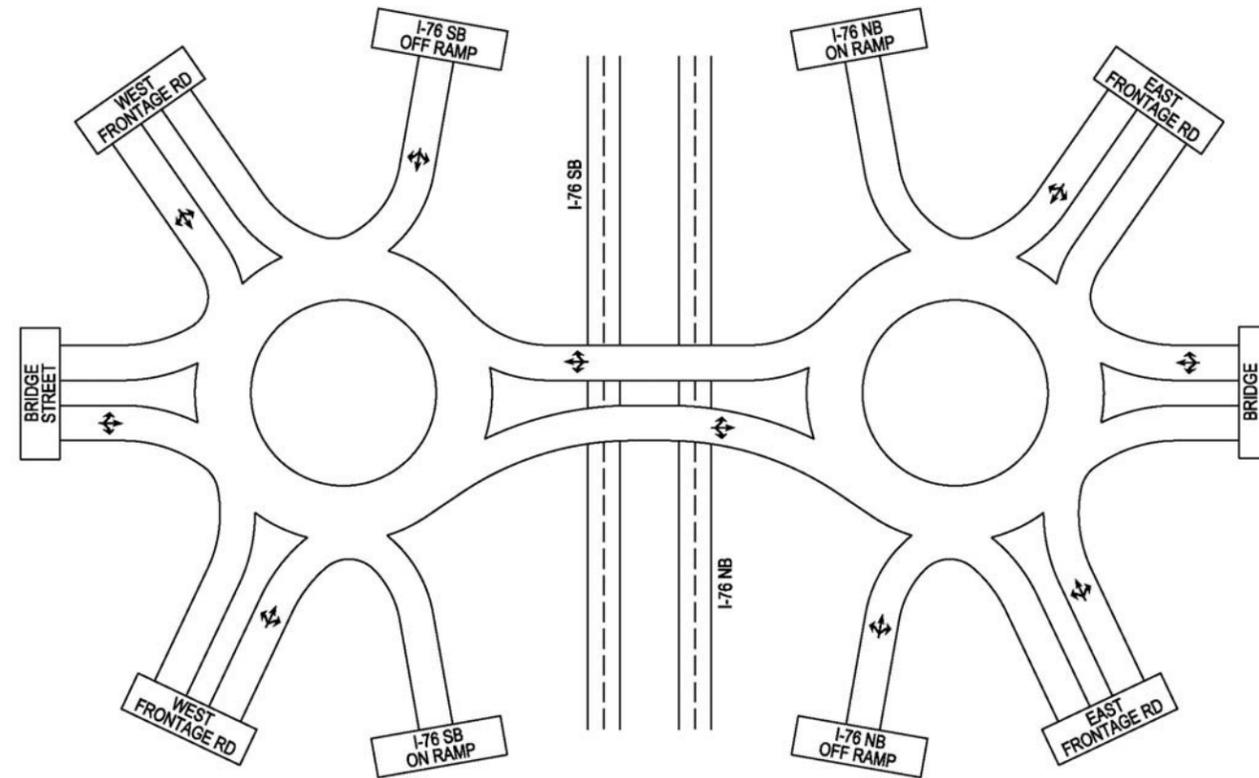


Figure 7. Alternative 2 Conceptual Lane Configuration

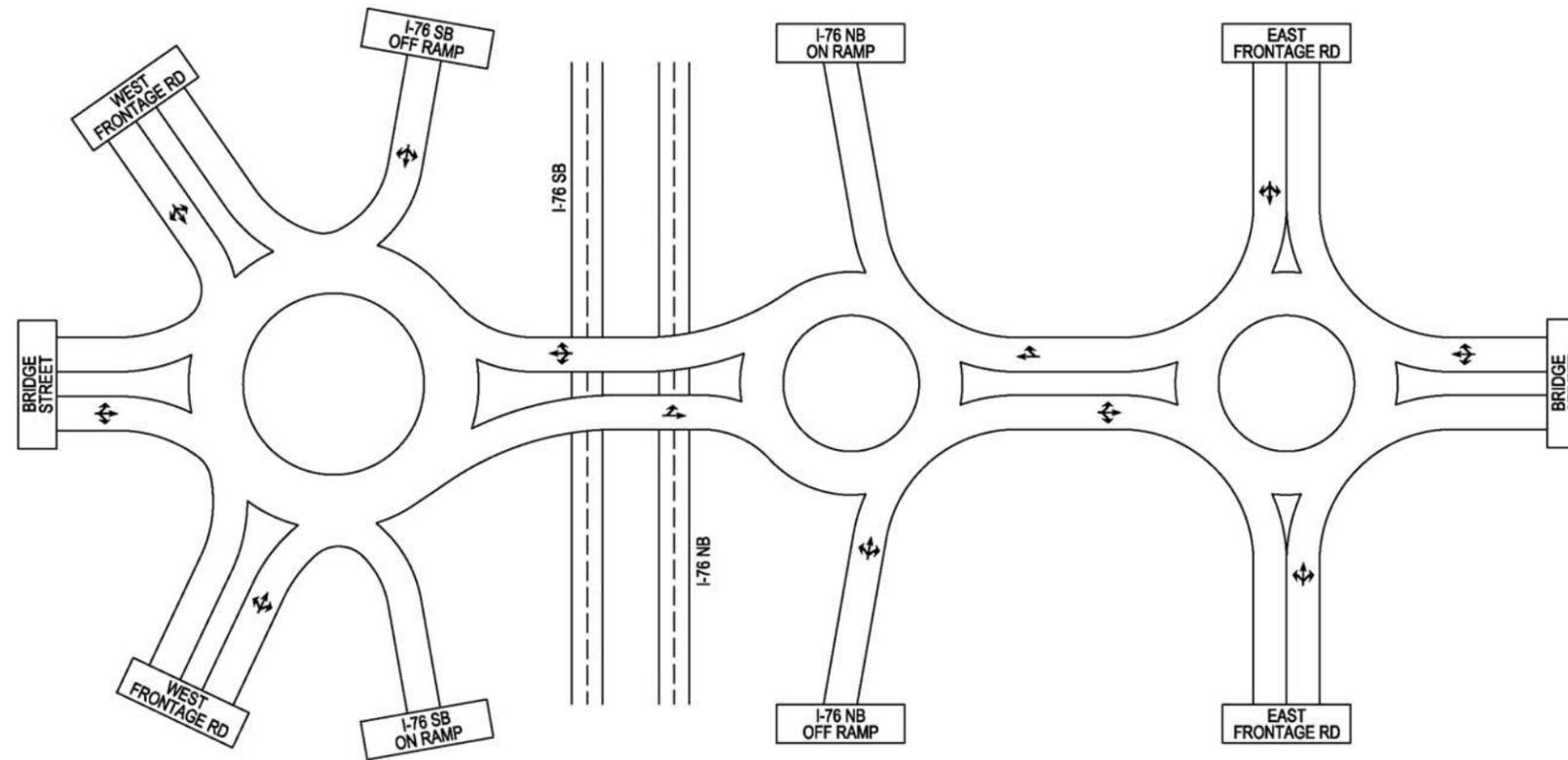


Figure 8. Alternative 3 Conceptual Lane Configuration

APPENDIX A
BRIDGE STREET AND WEST FRONTAGE ROAD
INTERSECTION

ALTERNATIVE 1: FOUR ROUNDABOUTS

OPERATIONAL ANALYSIS DOCUMENTATION

A.1 ARCADY Results (2019 and 2035).....A.1.1 – A.1.4
A.2 HCM Results (2019 and 2035)A.2.1 – A.2.4

Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	5.000	5.000	40.000	0.000	50.00
EB Bridge Street	10.000	366.000	10.000	0.000	386.00
NB West Frontage Road	15.000	5.000	10.000	0.000	30.00
WB Bridge Street	17.000	412.000	31.000	0.000	460.00
Total	47.00	788.00	91.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
f - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	50.00	386.00	30.00	460.00
Max V/C Ratio	0.07	0.42	0.04	0.49
Max Delay (s)	4.85	6.24	4.44	6.71
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	1.00	?	?

Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	21.000	26.000	34.000	0.000	81.00
EB Bridge Street	1.000	395.000	7.000	0.000	403.00
NB West Frontage Road	30.000	4.000	2.000	0.000	36.00
WB Bridge Street	20.000	495.000	30.000	0.000	545.00
Total	72.00	920.00	73.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
l' - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	81.00	403.00	36.00	545.00
Max V/C Ratio	0.12	0.46	0.05	0.53
Max Delay (s)	5.65	6.99	4.48	6.80
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	200.00	?	?

Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	3.000	5.000	40.000	0.000	48.00
EB Bridge Street	10.000	418.000	1.000	0.000	429.00
NB West Frontage Road	15.000	5.000	5.000	0.000	25.00
WB Bridge Street	18.000	419.000	33.000	0.000	470.00
Total	46.00	847.00	79.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
f - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	48.00	429.00	25.00	470.00
Max V/C Ratio	0.07	0.47	0.03	0.49
Max Delay (s)	4.85	6.82	4.57	6.74
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	1.00	?	?

Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	37.000	34.000	24.000	0.000	95.00
EB Bridge Street	2.000	530.000	14.000	0.000	546.00
NB West Frontage Road	6.000	6.000	28.000	0.000	40.00
WB Bridge Street	15.000	539.000	29.000	0.000	583.00
Total	60.00	1109.00	95.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
f - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	95.00	546.00	40.00	583.00
Max V/C Ratio	0.15	0.63	0.06	0.58
Max Delay (s)	6.18	10.01	5.13	7.73
Max LOS	A	B	A	A
Max 95th percentile Queue (Veh)	?	2.00	?	1.00



Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	5.000	5.000	40.000	0.000	50.00
EB Bridge Street	10.000	366.000	10.000	0.000	386.00
NB West Frontage Road	15.000	5.000	10.000	0.000	30.00
WB Bridge Street	17.000	412.000	31.000	0.000	460.00
Total	47.00	788.00	91.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	54.35	419.57	32.61	500.00
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	492.39	82.61	452.17	27.17
Capacity (Veh/hr)	764.88	1050.45	812.93	1112.01
Queue95 (Veh)	0.23	1.95	0.13	2.38
Delay (s)	5.42	7.68	4.81	8.10
V/C Ratio	0.07	0.40	0.04	0.45
LOS	A	A	A	A



Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	21.000	26.000	34.000	0.000	81.00
EB Bridge Street	1.000	395.000	7.000	0.000	403.00
NB West Frontage Road	30.000	4.000	2.000	0.000	36.00
WB Bridge Street	20.000	495.000	30.000	0.000	545.00
Total	72.00	920.00	73.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	88.04	438.04	39.13	592.39
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	572.83	97.83	473.91	14.13
Capacity (Veh/hr)	693.51	1000.31	807.64	1209.86
Queue95 (Veh)	0.43	2.26	0.15	2.78
Delay (s)	6.58	8.56	4.93	8.24
V/C Ratio	0.13	0.44	0.05	0.49
LOS	A	A	A	A



Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	3.000	5.000	40.000	0.000	48.00
EB Bridge Street	10.000	418.000	1.000	0.000	429.00
NB West Frontage Road	15.000	5.000	5.000	0.000	25.00
WB Bridge Street	18.000	419.000	33.000	0.000	470.00
Total	46.00	847.00	79.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	52.17	466.30	27.17	510.87
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	496.74	84.78	498.91	11.96
Capacity (Veh/hr)	761.72	1048.44	779.84	1126.78
Queue95 (Veh)	0.22	2.33	0.11	2.41
Delay (s)	5.42	8.38	4.96	8.08
V/C Ratio	0.07	0.44	0.03	0.45
LOS	A	A	A	A



Bridge Street and West Frontage Road Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB West Frontage Road	37.000	34.000	24.000	0.000	95.00
EB Bridge Street	2.000	530.000	14.000	0.000	546.00
NB West Frontage Road	6.000	6.000	28.000	0.000	40.00
WB Bridge Street	15.000	539.000	29.000	0.000	583.00
Total	60.00	1109.00	95.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB West Frontage Road	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	10.50	10.50	10.50	10.50	-

Geometry and Analysis Results

Leg	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	103.26	593.48	43.48	633.70
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	647.83	94.57	617.39	52.17
Capacity (Veh/hr)	652.48	1003.17	707.61	1172.40
Queue95 (Veh)	0.56	4.03	0.20	3.36
Delay (s)	7.34	11.61	5.73	9.32
V/C Ratio	0.16	0.59	0.06	0.54
LOS	A	B	A	A



APPENDIX B

BRIDGE STREET AND I-76 SOUTHBOUND RAMP TERMINAL INTERSECTION

ALTERNATIVE 1: FOUR ROUNDABOUTS

OPERATIONAL ANALYSIS DOCUMENTATION

B.1 ARCADY Results (2019 and 2035).....	B.1.1 – B.1.4
B.2 HCM Results (2019 and 2035)	B.2.1 – B.2.4

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	66.000	0.000	30.000	0.000	96.00
EB Bridge Street	358.000	63.000	0.000	0.000	421.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	394.000	104.000	0.000	498.00
Total	424.00	457.00	134.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	Exit-only	14.00
f - Effective flare length (ft)	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	Exit-only	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	96.00	421.00	Exit-only	498.00
Max V/C Ratio	0.14	0.48	Exit-only	0.52
Max Delay (s)	5.49	7.18	Exit-only	7.06
Max LOS	A	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	1.00	Exit-only	?

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	70.000	0.000	10.000	0.000	80.00
EB Bridge Street	297.000	162.000	0.000	0.000	459.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	475.000	70.000	0.000	545.00
Total	367.00	637.00	80.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	8.25	8.25	8.25	8.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	Exit-only	14.00
f - Effective flare length (ft)	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	Exit-only	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	80.00	459.00	Exit-only	545.00
Max V/C Ratio	0.12	0.52	Exit-only	0.53
Max Delay (s)	5.39	7.79	Exit-only	6.68
Max LOS	A	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	?	Exit-only	?



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	90.000	0.000	40.000	0.000	130.00
EB Bridge Street	413.000	60.000	0.000	0.000	473.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	380.000	145.000	0.000	525.00
Total	503.00	440.00	185.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	Exit-only	14.00
f - Effective flare length (ft)	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	Exit-only	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	130.00	473.00	Exit-only	525.00
Max V/C Ratio	0.19	0.56	Exit-only	0.55
Max Delay (s)	6.00	8.74	Exit-only	7.50
Max LOS	A	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	1.00	Exit-only	?

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	85.000	0.000	15.000	0.000	100.00
EB Bridge Street	390.000	170.000	0.000	0.000	560.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	498.000	105.000	0.000	603.00
Total	475.00	668.00	120.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	8.25	8.25	8.25	8.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	Exit-only	14.00
f - Effective flare length (ft)	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	Exit-only	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	100.00	560.00	Exit-only	603.00
Max V/C Ratio	0.15	0.65	Exit-only	0.58
Max Delay (s)	5.90	10.96	Exit-only	7.58
Max LOS	A	B	Exit-only	A
Max 95th percentile Queue (Veh)	?	2.00	Exit-only	1.00

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	66.000	0.000	30.000	0.000	96.00
EB Bridge Street	358.000	63.000	0.000	0.000	421.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	394.000	104.000	0.000	498.00
Total	424.00	457.00	134.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	104.35	457.61	0.00	541.30
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	541.30	145.65	101.09	0.00
Capacity (Veh/hr)	725.51	992.92	1176.65	1138.05
Queue95 (Veh)	0.50	2.47	0.00	2.63
Delay (s)	6.51	8.99	3.06	8.38
V/C Ratio	0.14	0.46	0.00	0.48
LOS	A	A	A	A

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	70.000	0.000	10.000	0.000	80.00
EB Bridge Street	297.000	162.000	0.000	0.000	459.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	475.000	70.000	0.000	545.00
Total	367.00	637.00	80.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	8.25	8.25	8.25	8.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	86.96	498.91	0.00	592.39
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	592.39	86.96	186.96	0.00
Capacity (Veh/hr)	719.68	1014.48	1083.44	1224.76
Queue95 (Veh)	0.41	2.78	0.00	2.72
Delay (s)	6.29	9.39	3.32	8.08
V/C Ratio	0.12	0.49	0.00	0.48
LOS	A	A	A	A

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	90.000	0.000	40.000	0.000	130.00
EB Bridge Street	413.000	60.000	0.000	0.000	473.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	380.000	145.000	0.000	525.00
Total	503.00	440.00	185.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	141.30	514.13	0.00	570.65
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	570.65	201.09	108.70	0.00
Capacity (Veh/hr)	706.98	945.81	1169.11	1138.05
Queue95 (Veh)	0.74	3.36	0.00	2.90
Delay (s)	7.36	10.96	3.08	8.81
V/C Ratio	0.20	0.54	0.00	0.50
LOS	A	B	A	A

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts
Operational Analysis Documentation

HCM Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB I-76 Off Ramp	85.000	0.000	15.000	0.000	100.00
EB Bridge Street	390.000	170.000	0.000	0.000	560.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	498.000	105.000	0.000	603.00
Total	475.00	668.00	120.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.00
Average	8.25	8.25	8.25	8.25	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	EB Bridge Street	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	108.70	608.70	0.00	655.43
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	655.43	130.43	201.09	0.00
Capacity (Veh/hr)	683.47	978.79	1069.80	1224.76
Queue95 (Veh)	0.56	4.50	0.00	3.30
Delay (s)	7.06	12.64	3.37	8.95
V/C Ratio	0.16	0.62	0.00	0.54
LOS	A	B	A	A

APPENDIX C

BRIDGE STREET AND I-76 NORTHBOUND RAMP TERMINAL INTERSECTION

ALTERNATIVE 1: FOUR ROUNDABOUTS AND ALTERNATIVE 3: THREE ROUNDABOUTS

OPERATIONAL ANALYSIS DOCUMENTATION

C.1 ARCADY Results (2019 and 2035).....	C.1.1 – C.1.4
C.2 HCM Results (2019 and 2035)	C.2.1 – C.2.4

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	47.000	46.000	0.000	93.00
NB I-76 Off Ramp	97.000	0.000	332.000	0.000	429.00
WB Bridge Street	16.000	166.000	0.000	0.000	182.00
Total	113.00	213.00	378.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
V - Approach road half-width (ft)	Exit-only	12.00	12.00	12.00
E - Entry width (ft)	Exit-only	14.00	14.00	14.00
f - Effective flare length (ft)	Exit-only	130.00	130.00	130.00
R - Entry radius (ft)	Exit-only	75.00	75.00	75.00
D - Inscribed circle diameter (ft)	Exit-only	150.00	150.00	150.00
PHI - Conflict (entry) angle (deg)	Exit-only	20.00	20.00	20.00
Exit Only	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	Exit-only	93.00	429.00	182.00
Max V/C Ratio	Exit-only	0.09	0.46	0.25
Max Delay (s)	Exit-only	3.56	6.38	6.07
Max LOS	Exit-only	A	A	A
Max 95th percentile Queue (Veh)	Exit-only	?	1.00	?

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	111.000	61.000	0.000	172.00
NB I-76 Off Ramp	52.000	0.000	420.000	0.000	472.00
WB Bridge Street	23.000	125.000	0.000	0.000	148.00
Total	75.00	236.00	481.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	8.75	8.75	8.75	8.75	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
V - Approach road half-width (ft)	Exit-only	12.00	12.00	12.00
E - Entry width (ft)	Exit-only	14.00	14.00	14.00
l' - Effective flare length (ft)	Exit-only	130.00	130.00	130.00
R - Entry radius (ft)	Exit-only	75.00	75.00	75.00
D - Inscribed circle diameter (ft)	Exit-only	150.00	150.00	150.00
PHI - Conflict (entry) angle (deg)	Exit-only	20.00	20.00	20.00
Exit Only	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	Exit-only	172.00	472.00	148.00
Max V/C Ratio	Exit-only	0.17	0.53	0.22
Max Delay (s)	Exit-only	3.85	7.66	6.23
Max LOS	Exit-only	A	A	A
Max 95th percentile Queue (Veh)	Exit-only	?	?	?

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	50.000	50.000	0.000	100.00
NB I-76 Off Ramp	125.000	0.000	340.000	0.000	465.00
WB Bridge Street	20.000	185.000	0.000	0.000	205.00
Total	145.00	235.00	390.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
V - Approach road half-width (ft)	Exit-only	12.00	12.00	12.00
E - Entry width (ft)	Exit-only	14.00	14.00	14.00
l' - Effective flare length (ft)	Exit-only	130.00	130.00	130.00
R - Entry radius (ft)	Exit-only	75.00	75.00	75.00
D - Inscribed circle diameter (ft)	Exit-only	150.00	150.00	150.00
PHI - Conflict (entry) angle (deg)	Exit-only	20.00	20.00	20.00
Exit Only	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	Exit-only	100.00	465.00	205.00
Max V/C Ratio	Exit-only	0.10	0.50	0.29
Max Delay (s)	Exit-only	3.58	6.92	6.42
Max LOS	Exit-only	A	A	A
Max 95th percentile Queue (Veh)	Exit-only	?	?	?

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	115.000	70.000	0.000	185.00
NB I-76 Off Ramp	75.000	0.000	468.000	0.000	543.00
WB Bridge Street	30.000	135.000	0.000	0.000	165.00
Total	105.00	250.00	538.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	8.75	8.75	8.75	8.75	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
V - Approach road half-width (ft)	Exit-only	12.00	12.00	12.00
E - Entry width (ft)	Exit-only	14.00	14.00	14.00
l' - Effective flare length (ft)	Exit-only	130.00	130.00	130.00
R - Entry radius (ft)	Exit-only	75.00	75.00	75.00
D - Inscribed circle diameter (ft)	Exit-only	150.00	150.00	150.00
PHI - Conflict (entry) angle (deg)	Exit-only	20.00	20.00	20.00
Exit Only	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	Exit-only	185.00	543.00	165.00
Max V/C Ratio	Exit-only	0.18	0.61	0.26
Max Delay (s)	Exit-only	3.91	9.38	6.84
Max LOS	Exit-only	A	A	A
Max 95th percentile Queue (Veh)	Exit-only	?	1.00	?

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	47.000	46.000	0.000	93.00
NB I-76 Off Ramp	97.000	0.000	332.000	0.000	429.00
WB Bridge Street	16.000	166.000	0.000	0.000	182.00
Total	113.00	213.00	378.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	0.00	101.09	466.30	197.83
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	541.30	0.00	101.09	410.87
Capacity (Veh/hr)	798.06	1190.74	1073.66	760.21
Queue95 (Veh)	0.00	0.28	2.24	1.04
Delay (s)	4.51	3.73	8.07	7.69
V/C Ratio	0.00	0.08	0.43	0.26
LOS	A	A	A	A

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	111.000	61.000	0.000	172.00
NB I-76 Off Ramp	52.000	0.000	420.000	0.000	472.00
WB Bridge Street	23.000	125.000	0.000	0.000	148.00
Total	75.00	236.00	481.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	8.75	8.75	8.75	8.75	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	0.00	186.96	513.04	160.87
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	592.39	0.00	186.96	522.82
Capacity (Veh/hr)	767.04	1201.87	1000.19	696.97
Queue95 (Veh)	0.00	0.55	3.01	0.89
Delay (s)	4.69	4.32	9.89	7.86
V/C Ratio	0.00	0.16	0.51	0.23
LOS	A	A	A	A

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	50.000	50.000	0.000	100.00
NB I-76 Off Ramp	125.000	0.000	340.000	0.000	465.00
WB Bridge Street	20.000	185.000	0.000	0.000	205.00
Total	145.00	235.00	390.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	9.25	9.25	9.25	9.25	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	0.00	108.70	505.43	222.83
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	570.65	0.00	108.70	423.91
Capacity (Veh/hr)	777.09	1190.74	1066.80	751.80
Queue95 (Veh)	0.00	0.30	2.60	1.24
Delay (s)	4.63	3.78	8.74	8.27
V/C Ratio	0.00	0.09	0.47	0.30
LOS	A	A	A	A

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	115.000	70.000	0.000	185.00
NB I-76 Off Ramp	75.000	0.000	468.000	0.000	543.00
WB Bridge Street	30.000	135.000	0.000	0.000	165.00
Total	105.00	250.00	538.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	8.75	8.75	8.75	8.75	-

Geometry and Analysis Results

Leg	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	0.00	201.09	590.22	179.35
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	655.44	0.00	201.09	584.78
Capacity (Veh/hr)	726.16	1201.87	988.47	661.04
Queue95 (Veh)	0.00	0.60	4.11	1.10
Delay (s)	4.96	4.43	11.87	8.82
V/C Ratio	0.00	0.17	0.60	0.27
LOS	A	A	B	A

APPENDIX D
BRIDGE STREET AND EAST FRONTAGE ROAD
INTERSECTION

ALTERNATIVE 1: FOUR ROUNDABOUTS AND
ALTERNATIVE 3: THREE ROUNDABOUTS

OPERATIONAL ANALYSIS DOCUMENTATION

D.1 ARCADY Results (2019 and 2035)..... D.1.1 – D.1.4
D.2 HCM Results (2019 and 2035) D.2.1 – D.2.4

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	10.000	5.000	20.000	0.000	35.00
EB Bridge Street	58.000	68.000	18.000	0.000	144.00
NB East Frontage Road	5.000	5.000	16.000	0.000	26.00
WB Bridge Street	10.000	156.000	10.000	0.000	176.00
Total	83.00	234.00	64.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	10.75	10.75	10.75	10.75	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
f - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	☐	☐	☐	☐
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	35.00	144.00	26.00	176.00
Max V/C Ratio	0.04	0.15	0.03	0.20
Max Delay (s)	3.60	3.89	3.76	4.57
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	?	?	?



Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	4.000	5.000	10.000	0.000	19.00
EB Bridge Street	10.000	138.000	15.000	0.000	163.00
NB East Frontage Road	10.000	5.000	58.000	0.000	73.00
WB Bridge Street	10.000	86.000	5.000	0.000	101.00
Total	34.00	234.00	88.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	6.25	6.25	6.25	6.25	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
l - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	19.00	163.00	73.00	101.00
Max V/C Ratio	0.02	0.16	0.07	0.11
Max Delay (s)	3.37	3.89	3.58	4.19
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	?	?	?

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	23.000	5.000	5.000	0.000	33.00
EB Bridge Street	81.000	79.000	15.000	0.000	175.00
NB East Frontage Road	5.000	5.000	22.000	0.000	32.00
WB Bridge Street	10.000	160.000	10.000	0.000	180.00
Total	119.00	249.00	52.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	10.75	10.75	10.75	10.75	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
f - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	33.00	175.00	32.00	180.00
Max V/C Ratio	0.04	0.18	0.04	0.20
Max Delay (s)	3.62	3.99	3.77	4.61
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	?	?	?

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	5.000	5.000	3.000	0.000	13.00
EB Bridge Street	15.000	158.000	17.000	0.000	190.00
NB East Frontage Road	10.000	5.000	68.000	0.000	83.00
WB Bridge Street	5.000	92.000	1.000	0.000	98.00
Total	35.00	260.00	89.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	6.25	6.25	6.25	6.25	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00
f - Effective flare length (ft)	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	130.00	130.00	130.00	130.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	13.00	190.00	83.00	98.00
Max V/C Ratio	0.01	0.19	0.09	0.11
Max Delay (s)	3.37	3.99	3.66	4.21
Max LOS	A	A	A	A
Max 95th percentile Queue (Veh)	?	?	?	?

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	10.000	5.000	20.000	0.000	35.00
EB Bridge Street	58.000	68.000	18.000	0.000	144.00
NB East Frontage Road	5.000	5.000	16.000	0.000	26.00
WB Bridge Street	10.000	156.000	10.000	0.000	176.00
Total	83.00	234.00	64.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	10.75	10.75	10.75	10.75	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	38.04	156.52	28.26	191.30
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	197.83	38.04	115.22	42.39
Capacity (Veh/hr)	1050.00	1153.58	1024.77	1041.65
Queue95 (Veh)	0.11	0.47	0.09	0.67
Delay (s)	3.74	4.29	3.75	5.15
V/C Ratio	0.04	0.14	0.03	0.18
LOS	A	A	A	A

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	4.000	5.000	10.000	0.000	19.00
EB Bridge Street	10.000	138.000	15.000	0.000	163.00
NB East Frontage Road	10.000	5.000	58.000	0.000	73.00
WB Bridge Street	10.000	86.000	5.000	0.000	101.00
Total	34.00	234.00	88.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	6.25	6.25	6.25	6.25	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	20.65	177.17	79.35	109.78
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	161.96	21.74	177.17	84.78
Capacity (Veh/hr)	1117.76	1180.76	1109.89	1019.18
Queue95 (Veh)	0.06	0.53	0.23	0.36
Delay (s)	3.37	4.34	3.85	4.50
V/C Ratio	0.02	0.15	0.07	0.11
LOS	A	A	A	A

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	23.000	5.000	5.000	0.000	33.00
EB Bridge Street	81.000	79.000	15.000	0.000	175.00
NB East Frontage Road	5.000	5.000	22.000	0.000	32.00
WB Bridge Street	10.000	160.000	10.000	0.000	180.00
Total	119.00	249.00	52.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.00
Average	10.75	10.75	10.75	10.75	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	35.87	190.22	34.78	195.65
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	208.70	21.74	107.61	45.65
Capacity (Veh/hr)	1039.72	1168.64	1030.57	1038.47
Queue95 (Veh)	0.11	0.58	0.10	0.69
Delay (s)	3.76	4.49	3.78	5.21
V/C Ratio	0.03	0.16	0.03	0.19
LOS	A	A	A	A

Bridge Street and East Frontage Road Intersection
Alternative 1: Four Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	U-Turn	Total
SB East Frontage Road	5.000	5.000	3.000	0.000	13.00
EB Bridge Street	15.000	158.000	17.000	0.000	190.00
NB East Frontage Road	10.000	5.000	68.000	0.000	83.00
WB Bridge Street	5.000	92.000	1.000	0.000	98.00
Total	35.00	260.00	89.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.00
Average	6.25	6.25	6.25	6.25	-

Geometry and Analysis Results

Leg	SB East Frontage Road	EB Bridge Street	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1
Lane Type	Single lane ▼	Single lane ▼	Single lane ▼	Single lane ▼
Number Of Conflicting Lanes	1	1	1	1
Destination Legs	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Demand (Veh/hr)	14.13	206.52	90.22	106.52
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	175.00	9.78	193.48	97.83
Capacity (Veh/hr)	1106.10	1192.55	1094.43	1008.75
Queue95 (Veh)	0.04	0.63	0.27	0.35
Delay (s)	3.36	4.52	4.00	4.52
V/C Ratio	0.01	0.17	0.08	0.11
LOS	A	A	A	A

APPENDIX E

BRIDGE STREET AND I-76 SOUTHBOUND RAMP TERMINAL INTERSECTION

ALTERNATIVE 2: TWO ROUNDABOUTS AND ALTERNATIVE 3: THREE ROUNDABOUTS

OPERATIONAL ANALYSIS DOCUMENTATION

E.1 ARCADY Results (2019 and 2035).....	E.1.1 – E.1.4
E.2 HCM Results (2019 and 2035)	E.2.1 – E.2.4

Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	2.000	59.000	5.000	0.000	30.000	0.000	96.00
SB West Frontage Road	5.000	5.000	34.000	6.000	0.000	0.000	50.00
EB Bridge Street	10.000	311.000	55.000	0.000	10.000	0.000	386.00
NB West Frontage Road	13.000	2.000	0.000	5.000	10.000	0.000	30.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	15.000	353.000	26.000	104.000	0.000	498.00
Total	30.00	392.00	447.00	37.00	154.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	9.000	9.000	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.000	6.000	6.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.000	13.000	13.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00	Exit-only	14.00
l' - Effective flare length (ft)	130.00	130.00	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	180.00	180.00	180.00	180.00	Exit-only	180.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	96.00	50.00	386.00	30.00	Exit-only	498.00
Max V/C Ratio	0.14	0.07	0.46	0.04	Exit-only	0.53
Max Delay (s)	5.37	5.21	7.14	4.77	Exit-only	7.26
Max LOS	A	A	A	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	?	1.00	?	Exit-only	?



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	3.000	63.000	4.000	0.000	10.000	0.000	80.00
SB West Frontage Road	21.000	26.000	22.000	12.000	0.000	0.000	81.00
EB Bridge Street	1.000	256.000	139.000	0.000	7.000	0.000	403.00
NB West Frontage Road	19.000	11.000	0.000	4.000	2.000	0.000	36.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	17.000	432.000	26.000	70.000	0.000	545.00
Total	44.00	373.00	597.00	42.00	89.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	16.000	16.000	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.000	3.000	3.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.000	5.000	5.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00	Exit-only	14.00
l' - Effective flare length (ft)	130.00	130.00	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	180.00	180.00	180.00	180.00	Exit-only	180.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	80.00	81.00	403.00	36.00	Exit-only	545.00
Max V/C Ratio	0.11	0.13	0.48	0.05	Exit-only	0.53
Max Delay (s)	5.22	5.80	7.53	4.59	Exit-only	6.78
Max LOS	A	A	A	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	?	1.00	?	Exit-only	?



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	4.000	80.000	6.000	0.000	40.000	0.000	130.00
SB West Frontage Road	3.000	5.000	35.000	5.000	0.000	0.000	48.00
EB Bridge Street	10.000	365.000	53.000	0.000	1.000	0.000	429.00
NB West Frontage Road	13.000	2.000	0.000	5.000	5.000	0.000	25.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	14.000	339.000	27.000	145.000	0.000	525.00
Total	30.00	466.00	433.00	37.00	191.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	9.000	9.000	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.000	6.000	6.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.000	13.000	13.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00	Exit-only	14.00
l' - Effective flare length (ft)	130.00	130.00	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	180.00	180.00	180.00	180.00	Exit-only	180.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	130.00	48.00	429.00	25.00	Exit-only	525.00
Max V/C Ratio	0.19	0.07	0.53	0.04	Exit-only	0.55
Max Delay (s)	5.76	5.45	8.44	5.13	Exit-only	7.60
Max LOS	A	A	A	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	?	?	?	Exit-only	?



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	2.000	79.000	4.000	0.000	15.000	0.000	100.00
SB West Frontage Road	37.000	34.000	17.000	7.000	0.000	0.000	95.00
EB Bridge Street	2.000	369.000	161.000	0.000	14.000	0.000	546.00
NB West Frontage Road	4.000	2.000	0.000	6.000	28.000	0.000	40.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	13.000	460.000	25.000	105.000	0.000	603.00
Total	45.00	497.00	642.00	38.00	162.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	16.000	16.000	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.000	3.000	3.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.000	5.000	5.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
V - Approach road half-width (ft)	12.00	12.00	12.00	12.00	Exit-only	12.00
E - Entry width (ft)	14.00	14.00	14.00	14.00	Exit-only	14.00
l' - Effective flare length (ft)	130.00	130.00	130.00	130.00	Exit-only	130.00
R - Entry radius (ft)	65.00	65.00	65.00	65.00	Exit-only	65.00
D - Inscribed circle diameter (ft)	180.00	180.00	180.00	180.00	Exit-only	180.00
PHI - Conflict (entry) angle (deg)	20.00	20.00	20.00	20.00	Exit-only	20.00
Exit Only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	100.00	95.00	546.00	40.00	Exit-only	603.00
Max V/C Ratio	0.15	0.16	0.67	0.06	Exit-only	0.60
Max Delay (s)	5.85	6.57	11.92	5.39	Exit-only	8.07
Max LOS	A	A	B	A	Exit-only	A
Max 95th percentile Queue (Veh)	?	?	3.00	?	Exit-only	1.00



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	2.000	59.000	5.000	0.000	30.000	0.000	96.00
SB West Frontage Road	5.000	5.000	34.000	6.000	0.000	0.000	50.00
EB Bridge Street	10.000	311.000	55.000	0.000	10.000	0.000	386.00
NB West Frontage Road	13.000	2.000	0.000	5.000	10.000	0.000	30.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	15.000	353.000	26.000	104.000	0.000	498.00
Total	30.00	392.00	447.00	37.00	154.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	9.000	9.000	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.000	6.000	6.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.000	13.000	13.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	104.35	54.35	419.57	32.61	0.00	541.30
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	568.48	638.05	228.26	597.83	128.26	27.17
Capacity (Veh/hr)	708.91	674.34	924.72	715.54	1150.17	1112.01
Queue95 (Veh)	0.51	0.26	2.40	0.14	0.00	2.74
Delay (s)	6.69	6.21	9.35	5.50	3.13	8.70
V/C Ratio	0.15	0.08	0.45	0.05	0.00	0.49
LOS	A	A	A	A	A	A



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	3.000	63.000	4.000	0.000	10.000	0.000	80.00
SB West Frontage Road	21.000	26.000	22.000	12.000	0.000	0.000	81.00
EB Bridge Street	1.000	256.000	139.000	0.000	7.000	0.000	403.00
NB West Frontage Road	19.000	11.000	0.000	4.000	2.000	0.000	36.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	17.000	432.000	26.000	70.000	0.000	545.00
Total	44.00	373.00	597.00	42.00	89.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	16.000	16.000	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.000	3.000	3.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.000	5.000	5.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	86.96	88.04	438.04	39.13	0.00	592.39
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	606.52	659.78	184.78	560.87	201.09	14.13
Capacity (Veh/hr)	710.93	643.73	930.99	751.81	1071.97	1209.86
Queue95 (Veh)	0.42	0.47	2.56	0.16	0.00	2.78
Delay (s)	6.38	7.16	9.61	5.31	3.36	8.24
V/C Ratio	0.12	0.14	0.47	0.05	0.00	0.49
LOS	A	A	A	A	A	A



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	4.000	80.000	6.000	0.000	40.000	0.000	130.00
SB West Frontage Road	3.000	5.000	35.000	5.000	0.000	0.000	48.00
EB Bridge Street	10.000	365.000	53.000	0.000	1.000	0.000	429.00
NB West Frontage Road	13.000	2.000	0.000	5.000	5.000	0.000	25.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	14.000	339.000	27.000	145.000	0.000	525.00
Total	30.00	466.00	433.00	37.00	191.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	9.000	9.000	9.000	9.000	9.000	9.000	9.00
EB Bridge Street	14.000	14.000	14.000	14.000	14.000	14.000	14.00
NB West Frontage Road	6.000	6.000	6.000	6.000	6.000	6.000	6.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	13.000	13.000	13.000	13.000	13.000	13.000	13.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	141.30	52.17	466.30	27.17	0.00	570.65
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	582.61	697.82	285.87	700.00	120.65	11.96
Capacity (Veh/hr)	699.98	640.05	879.18	653.84	1157.93	1126.78
Queue95 (Veh)	0.75	0.27	3.19	0.13	0.00	2.95
Delay (s)	7.45	6.53	11.27	5.95	3.11	8.96
V/C Ratio	0.20	0.08	0.53	0.04	0.00	0.51
LOS	A	A	B	A	A	A



Bridge Street and I-76 Southbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts and Alternative 3: Three Roundabouts
Operational Analysis Documentation

HCM Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB I-76 Off Ramp	2.000	79.000	4.000	0.000	15.000	0.000	100.00
SB West Frontage Road	37.000	34.000	17.000	7.000	0.000	0.000	95.00
EB Bridge Street	2.000	369.000	161.000	0.000	14.000	0.000	546.00
NB West Frontage Road	4.000	2.000	0.000	6.000	28.000	0.000	40.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	0.000	13.000	460.000	25.000	105.000	0.000	603.00
Total	45.00	497.00	642.00	38.00	162.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
SB West Frontage Road	16.000	16.000	16.000	16.000	16.000	16.000	16.00
EB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
NB West Frontage Road	3.000	3.000	3.000	3.000	3.000	3.000	3.00
SB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
WB Bridge Street	5.000	5.000	5.000	5.000	5.000	5.000	5.00
Average	8.67	8.67	8.67	8.67	8.67	8.67	-

Geometry and Analysis Results

Leg	SB I-76 Off Ramp	SB West Frontage Road	EB Bridge Street	NB West Frontage Road	SB I-76 On Ramp	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	108.70	103.26	593.48	43.48	0.00	655.43
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	707.61	778.26	225.00	747.82	253.26	52.17
Capacity (Veh/hr)	654.25	583.94	900.80	635.51	1024.44	1172.40
Queue95 (Veh)	0.59	0.64	5.11	0.22	0.00	3.60
Delay (s)	7.43	8.37	14.65	6.42	3.51	9.69
V/C Ratio	0.17	0.18	0.66	0.07	0.00	0.56
LOS	A	A	B	A	A	A



APPENDIX F
BRIDGE STREET AND I-76 NORTHBOUND RAMP TERMINAL
INTERSECTION

ALTERNATIVE 2: TWO ROUNDABOUTS

OPERATIONAL ANALYSIS DOCUMENTATION

F.1 ARCADY Results (2019 and 2035) F.1.1 – F.1.4
F.2 HCM Results (2019 and 2035)..... F.2.1 – F.2.4

Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	1.000	9.000	0.000	5.000	20.000	0.000	35.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	19.000	22.000	6.000	46.000	0.000	93.00
NB I-76 Off Ramp	39.000	46.000	12.000	0.000	332.000	0.000	429.00
NB East Frontage Road	5.000	5.000	1.000	15.000	0.000	0.000	26.00
WB Bridge Street	10.000	14.000	142.000	0.000	10.000	0.000	176.00
Total	55.00	93.00	177.00	26.00	408.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.000	2.000	2.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.000	19.000	19.00
Average	8.83	8.83	8.83	8.83	8.83	8.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	Exit-only	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	Exit-only	14.00	14.00	14.00	14.00
l' - Effective flare length (ft)	130.00	Exit-only	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	Exit-only	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	180.00	Exit-only	180.00	180.00	180.00	180.00
PHI - Conflict (entry) angle (deg)	20.00	Exit-only	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	35.00	Exit-only	93.00	429.00	26.00	176.00
Max V/C Ratio	0.05	Exit-only	0.09	0.47	0.04	0.25
Max Delay (s)	4.65	Exit-only	3.66	6.64	4.79	6.13
Max LOS	A	Exit-only	A	A	A	A
Max 95th percentile Queue (Veh)	?	Exit-only	?	200.00	?	?



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

ARCADY Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	1.000	3.000	0.000	5.000	10.000	0.000	19.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	7.000	94.000	10.000	61.000	0.000	172.00
NB I-76 Off Ramp	3.000	44.000	5.000	0.000	420.000	0.000	472.00
NB East Frontage Road	10.000	5.000	9.000	49.000	0.000	0.000	73.00
WB Bridge Street	10.000	13.000	73.000	0.000	5.000	0.000	101.00
Total	24.00	72.00	181.00	64.00	496.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
Average	5.83	5.83	5.83	5.83	5.83	5.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	Exit-only	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	Exit-only	14.00	14.00	14.00	14.00
l' - Effective flare length (ft)	130.00	Exit-only	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	Exit-only	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	180.00	Exit-only	180.00	180.00	180.00	180.00
PHI - Conflict (entry) angle (deg)	20.00	Exit-only	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	19.00	Exit-only	172.00	472.00	73.00	101.00
Max V/C Ratio	0.03	Exit-only	0.17	0.53	0.10	0.16
Max Delay (s)	4.66	Exit-only	3.93	7.84	5.09	5.96
Max LOS	A	Exit-only	A	A	A	A
Max 95th percentile Queue (Veh)	?	Exit-only	?	?	?	?



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	2,000	21,000	0,000	5,000	5,000	0,000	33,000
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0,000
EB Bridge Street	0,000	23,000	23,000	4,000	50,000	0,000	100,000
NB I-76 Off Ramp	58,000	56,000	11,000	0,000	340,000	0,000	465,000
NB East Frontage Road	5,000	5,000	2,000	20,000	0,000	0,000	32,000
WB Bridge Street	10,000	16,000	144,000	0,000	10,000	0,000	180,000
Total	75,000	121,000	180,000	29,000	405,000	0,000	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	2,000	2,000	2,000	2,000	2,000	2,000	2,000
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0,000
EB Bridge Street	8,000	8,000	8,000	8,000	8,000	8,000	8,000
NB I-76 Off Ramp	10,000	10,000	10,000	10,000	10,000	10,000	10,000
NB East Frontage Road	14,000	14,000	14,000	14,000	14,000	14,000	14,000
WB Bridge Street	19,000	19,000	19,000	19,000	19,000	19,000	19,000
Average	8.83	8.83	8.83	8.83	8.83	8.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	Exit-only	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	Exit-only	14.00	14.00	14.00	14.00
l' - Effective flare length (ft)	130.00	Exit-only	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	Exit-only	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	180.00	Exit-only	180.00	180.00	180.00	180.00
PHI - Conflict (entry) angle (deg)	20.00	Exit-only	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	33.00	Exit-only	100.00	465.00	32.00	180.00
Max V/C Ratio	0.05	Exit-only	0.10	0.50	0.05	0.26
Max Delay (s)	4.72	Exit-only	3.65	7.11	4.86	6.26
Max LOS	A	Exit-only	A	A	A	A
Max 95th percentile Queue (Veh)	?	Exit-only	?	?	?	?



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

ARCADY Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	1.000	4.000	0.000	5.000	3.000	0.000	13.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	9.000	96.000	10.000	70.000	0.000	185.00
NB I-76 Off Ramp	6.000	62.000	7.000	0.000	468.000	0.000	543.00
NB East Frontage Road	10.000	5.000	12.000	56.000	0.000	0.000	83.00
WB Bridge Street	5.000	17.000	75.000	0.000	1.000	0.000	98.00
Total	22.00	97.00	190.00	71.00	542.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
Average	5.83	5.83	5.83	5.83	5.83	5.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
V - Approach road half-width (ft)	12.00	Exit-only	12.00	12.00	12.00	12.00
E - Entry width (ft)	14.00	Exit-only	14.00	14.00	14.00	14.00
l' - Effective flare length (ft)	130.00	Exit-only	130.00	130.00	130.00	130.00
R - Entry radius (ft)	65.00	Exit-only	65.00	65.00	65.00	65.00
D - Inscribed circle diameter (ft)	180.00	Exit-only	180.00	180.00	180.00	180.00
PHI - Conflict (entry) angle (deg)	20.00	Exit-only	20.00	20.00	20.00	20.00
Exit Only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Percentage Intercept Adjustment (%)	90.00	90.00	90.00	90.00	90.00	90.00
Average Demand (Veh/hr)	13.00	Exit-only	185.00	543.00	83.00	98.00
Max V/C Ratio	0.02	Exit-only	0.18	0.61	0.12	0.16
Max Delay (s)	4.89	Exit-only	3.96	9.47	5.53	6.31
Max LOS	A	Exit-only	A	A	A	A
Max 95th percentile Queue (Veh)	?	Exit-only	?	1.00	?	?



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

HCM Results

2019 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	1.000	9.000	0.000	5.000	20.000	0.000	35.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	19.000	22.000	6.000	46.000	0.000	93.00
NB I-76 Off Ramp	39.000	46.000	12.000	0.000	332.000	0.000	429.00
NB East Frontage Road	5.000	5.000	1.000	15.000	0.000	0.000	26.00
WB Bridge Street	10.000	14.000	142.000	0.000	10.000	0.000	176.00
Total	55.00	93.00	177.00	26.00	408.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.000	2.000	2.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.000	19.000	19.00
Average	8.83	8.83	8.83	8.83	8.83	8.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	38.04	0.00	101.09	466.30	28.26	191.30
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	608.69	579.35	38.04	139.13	526.09	453.26
Capacity (Veh/hr)	738.63	774.65	1153.58	1040.15	720.17	732.61
Queue95 (Veh)	0.16	0.00	0.29	2.36	0.12	1.04
Delay (s)	5.40	4.65	3.86	8.48	5.40	7.95
V/C Ratio	0.05	0.00	0.09	0.45	0.04	0.26
LOS	A	A	A	A	A	A



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

HCM Results

2019 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	1.000	3.000	0.000	5.000	10.000	0.000	19.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	7.000	94.000	10.000	61.000	0.000	172.00
NB I-76 Off Ramp	3.000	44.000	5.000	0.000	420.000	0.000	472.00
NB East Frontage Road	10.000	5.000	9.000	49.000	0.000	0.000	73.00
WB Bridge Street	10.000	13.000	73.000	0.000	5.000	0.000	101.00
Total	24.00	72.00	181.00	64.00	496.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
Average	5.83	5.83	5.83	5.83	5.83	5.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	20.65	0.00	186.96	513.04	79.35	109.78
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	684.79	614.13	21.74	208.69	700.00	607.61
Capacity (Veh/hr)	714.83	759.57	1180.76	982.63	708.92	651.71
Queue95 (Veh)	0.09	0.00	0.56	3.11	0.38	0.60
Delay (s)	5.33	4.74	4.41	10.21	6.28	7.48
V/C Ratio	0.03	0.00	0.16	0.52	0.11	0.17
LOS	A	A	A	B	A	A



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

HCM Results

2035 - AM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	2.000	21.000	0.000	5.000	5.000	0.000	33.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	23.000	23.000	4.000	50.000	0.000	100.00
NB I-76 Off Ramp	58.000	56.000	11.000	0.000	340.000	0.000	465.00
NB East Frontage Road	5.000	5.000	2.000	20.000	0.000	0.000	32.00
WB Bridge Street	10.000	16.000	144.000	0.000	10.000	0.000	180.00
Total	75.00	121.00	180.00	29.00	405.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	2.000	2.000	2.000	2.000	2.000	2.000	2.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	8.000	8.000	8.000	8.000	8.000	8.000	8.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	14.000	14.000	14.000	14.000	14.000	14.000	14.00
WB Bridge Street	19.000	19.000	19.000	19.000	19.000	19.000	19.00
Average	8.83	8.83	8.83	8.83	8.83	8.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	35.87	0.00	108.70	505.43	34.78	195.65
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	632.61	592.39	21.74	130.43	531.52	469.57
Capacity (Veh/hr)	723.31	765.63	1168.64	1047.00	716.13	722.31
Queue95 (Veh)	0.16	0.00	0.31	2.69	0.15	1.10
Delay (s)	5.48	4.70	3.86	9.02	5.53	8.18
V/C Ratio	0.05	0.00	0.09	0.48	0.05	0.27
LOS	A	A	A	A	A	A



Bridge Street and I-76 Northbound Ramp Terminal Intersection
Alternative 2: Two Roundabouts
Operational Analysis Documentation

HCM Results

2035 - PM Peak Period

Volumes

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Total
SB East Frontage Road	1.000	4.000	0.000	5.000	3.000	0.000	13.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	0.000	9.000	96.000	10.000	70.000	0.000	185.00
NB I-76 Off Ramp	6.000	62.000	7.000	0.000	468.000	0.000	543.00
NB East Frontage Road	10.000	5.000	12.000	56.000	0.000	0.000	83.00
WB Bridge Street	5.000	17.000	75.000	0.000	1.000	0.000	98.00
Total	22.00	97.00	190.00	71.00	542.00	0.00	-

Truck Percentages

From \ To	1st	2nd	3rd	4th	5th	U-Turn	Average
SB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
NB I-76 On Ramp	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	Exit-only	0.00
EB Bridge Street	7.000	7.000	7.000	7.000	7.000	7.000	7.00
NB I-76 Off Ramp	10.000	10.000	10.000	10.000	10.000	10.000	10.00
NB East Frontage Road	0.000	0.000	0.000	0.000	0.000	0.000	0.00
WB Bridge Street	18.000	18.000	18.000	18.000	18.000	18.000	18.00
Average	5.83	5.83	5.83	5.83	5.83	5.83	-

Geometry and Analysis Results

Leg	SB East Frontage Road	NB I-76 On Ramp	EB Bridge Street	NB I-76 Off Ramp	NB East Frontage Road	WB Bridge Street
HCM Lane	1	1	1	1	1	1
Lane Type	Single lane	Single lane	Single lane	Single lane	Single lane	Single lane
Number Of Conflicting Lanes	1	1	1	1	1	1
Destination Legs	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Demand (Veh/hr)	14.13	0.00	201.09	590.22	90.22	106.52
Pedestrian Flow (Veh/hr)	0.00	0.00	0.00	0.00	0.00	0.00
Conflicting Flow (Veh/hr)	759.78	665.22	9.78	210.87	778.26	682.61
Capacity (Veh/hr)	670.91	727.16	1192.55	980.80	662.67	611.75
Queue95 (Veh)	0.06	0.00	0.61	4.18	0.47	0.63
Delay (s)	5.59	4.95	4.47	12.06	6.97	7.99
V/C Ratio	0.02	0.00	0.17	0.60	0.14	0.17
LOS	A	A	A	B	A	A



The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and payment must be properly documented to ensure the integrity of the financial statements. This includes recording the date, amount, and purpose of each transaction.

Secondly, the document highlights the need for regular reconciliation of bank accounts. By comparing the company's records with the bank statements, any discrepancies can be identified and corrected promptly. This process helps to prevent errors and ensures that the cash balance is always up-to-date.

Another key aspect is the proper classification of expenses. It is crucial to categorize each expense correctly according to the accounting system. This allows for a clear understanding of where the money is being spent and facilitates the preparation of budget reports.

Finally, the document stresses the importance of timely reporting. Financial statements should be prepared and reviewed on a regular basis to provide management with the information they need to make informed decisions. Delaying the reporting process can lead to outdated data and potentially miss critical trends.

I-76 & Bridge Street INTERCHANGE



Air Quality

Technical Report

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Appendices

Appendix A: I-76 and Bridge Street Interchange 2035 Conditions

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List of acronyms and abbreviations

Act	Clean Air Act of 1970
APCD	Air Pollution Control Division
Brighton	City of Brighton
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CO	Carbon monoxide
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
LOS	Level of service
MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
MSAT	Mobile source air toxic
NAAQS	National Ambient Air Quality Standards
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
O ₃	Ozone
PM _{2.5}	Particulate matter 2.5 micrometers in diameter and smaller
PM ₁₀	Particulate matter 10 micrometers in diameter and smaller
ROW	Right of way
RTP	Regional Transportation Plan
SIP	State Implementation Plan
SLS	System-Level Study
SO ₂	Sulfur dioxide
STIP	Statewide Transportation Improvement Plan
TIP	Transportation Improvement Program
VMT	Vehicle miles traveled/vehicle miles of travel
VOC	Volatile organic compound

1. Introduction

The I-76 and Bridge Street Interchange Environmental Assessment (EA) is a joint effort between the City of Brighton (Brighton), the Federal Highway Administration (FHWA), and the Colorado Department of Transportation (CDOT). This EA will identify potential impacts of the proposed interchange on the built and natural environment.

1.1 Air Quality

A qualitative analysis of potential impacts to air quality for the No-Action Alternative and the three Action Alternatives under evaluation was conducted as part of the I-76 and Bridge Street Interchange Environmental Assessment. Exhibit 1-1 shows the location of the project. Although transportation projects can impact air quality during both the construction phase and the maintenance and operation phase of a project, air quality is primarily affected by increased traffic volumes and vehicle congestion.

1.2 No-Action Alternative

The No-Action Alternative serves as the baseline against which Action Alternatives were compared. For the purposes of this study, the No-Action Alternative is defined as the existing facilities within the project area. Under the No-Action Alternative, no further improvements—aside from ongoing operations and maintenance—would be made to the Bridge Street overpass at I-76.

Exhibit 1-1 Project Location Map

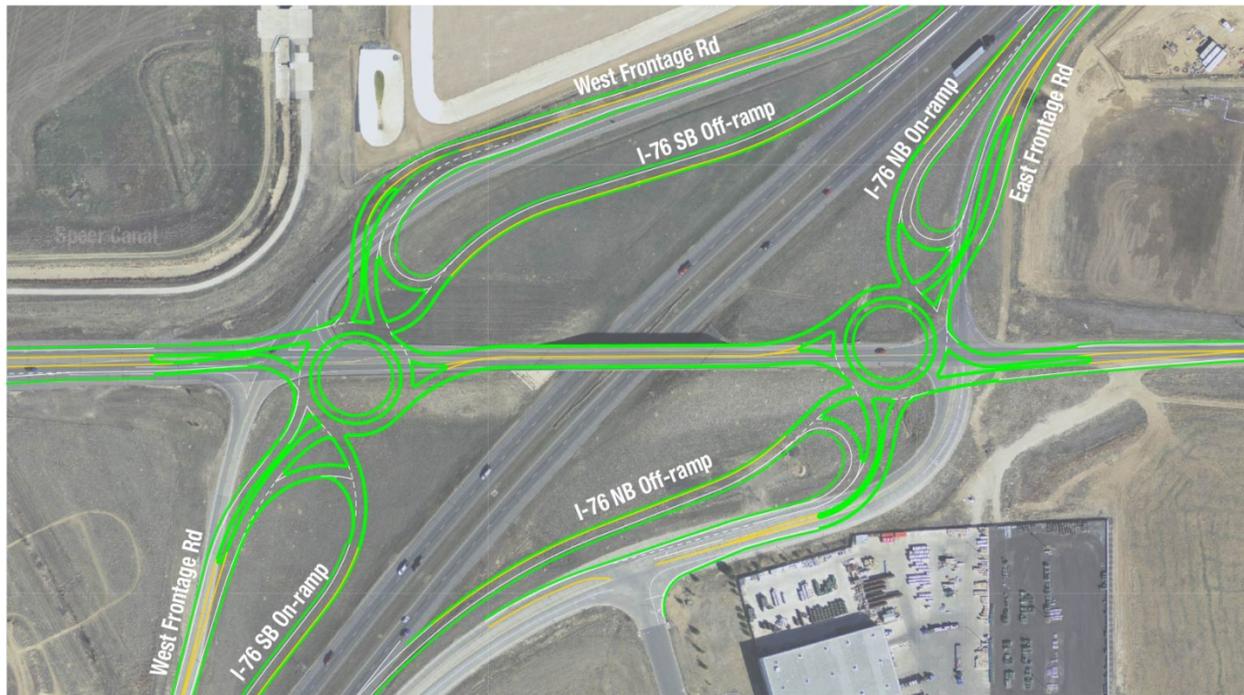


1.3 Preferred Alternative: Two-Roundabout Interchange Design

The Preferred Alternative for this EA is the Two-Roundabout Interchange. This alternative combines the frontage roads and ramp terminals to make one 6-legged roundabout on both the east and west sides of I-76 (see Exhibit 1-2). This alternative meets the project Purpose and Need. It preserves the existing bridge, can be designed within the existing right of way (ROW), and avoids impacts to the Speer Canal to the northwest of the interchange. This alternative is expected to operate at Level of Service (LOS) B in the year 2035.

Each roundabout has an outside diameter of 200 feet, including a 12-foot truck apron for truck traffic. To develop approach angles as a traffic-calming technique and to lessen ROW impacts, both roundabouts have been placed off center of the existing Bridge Street center line. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right-turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. This alternative has the least amount of access points among the Action Alternatives.

Exhibit 1-2 Preferred Alternative: Two-Roundabout Interchange Design

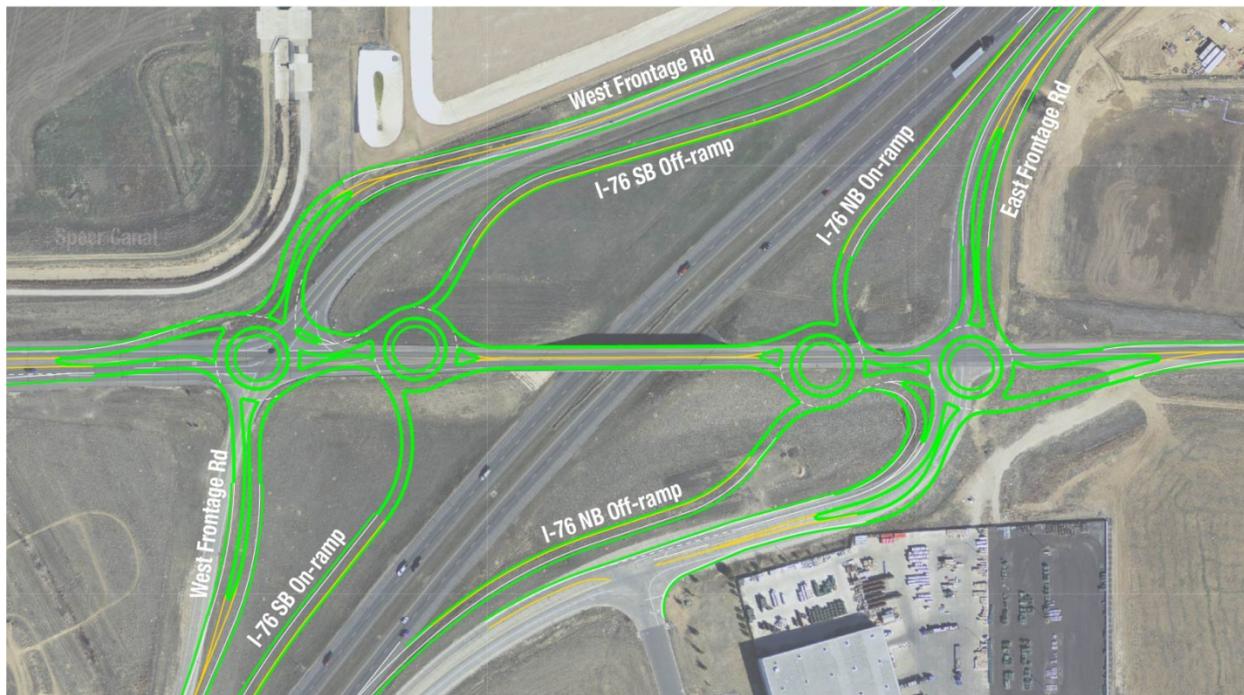


1.4 Alternative 2: Four-Roundabout Interchange Design

Alternative 2 for this EA is the Four-Roundabout Interchange. Exhibit 1-3 shows that this alternative creates two four-legged roundabouts on each side (east and west) of I-76. This alternative meets the project Purpose and Need. It preserves the existing bridge and has minor ROW impacts. This alternative is expected to operate at LOS B in the year 2035.

The two four-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 110 feet, including a 12-foot truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts have been placed off center of the existing Bridge Street center line slightly to develop approach angles as a traffic-calming technique and to lessen ROW impacts. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right-turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

Exhibit 1-3 Alternative 2: Four-Roundabout Interchange Design

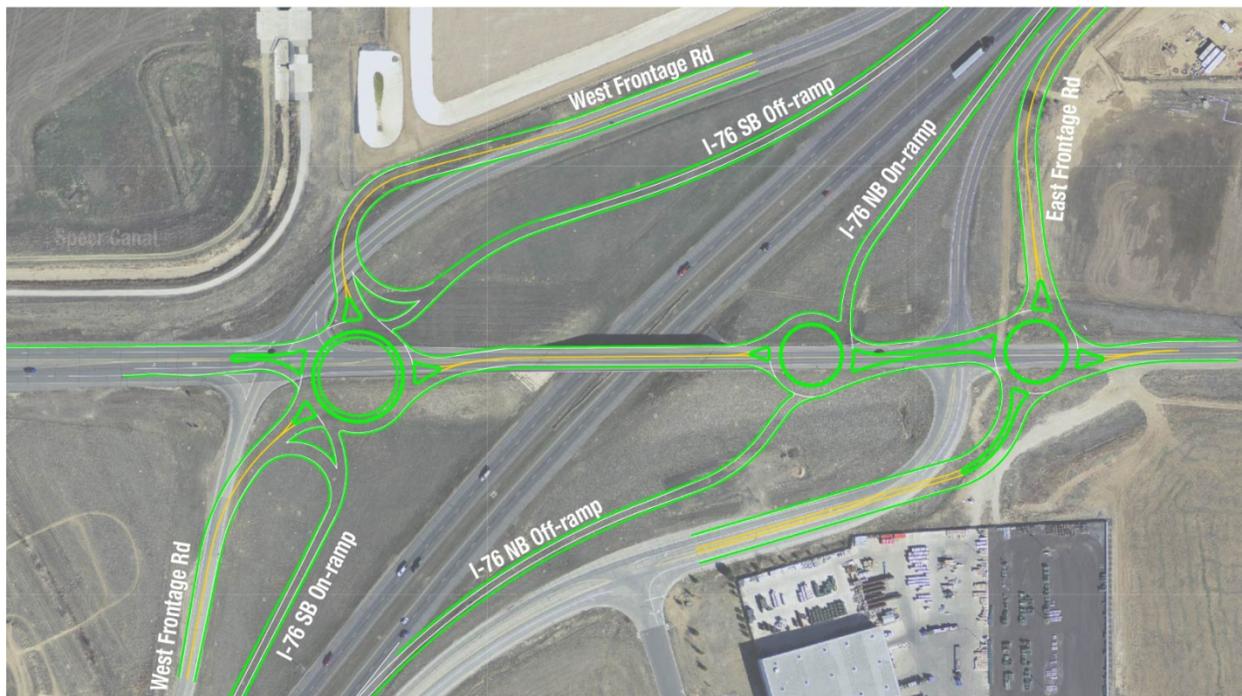


1.5 Alternative 3: Three-Roundabout Interchange Design

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76 (see Exhibit 1-4). The West Frontage Road and I-76 westbound ramps are combined into one six-legged roundabout with an outside diameter of 200 feet, including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one four-legged roundabout and the frontage roads into another four-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet, including a 12-foot truck apron. This alternative meets the project Purpose and Need. It preserves the existing bridge and has minor ROW impacts, primarily to the east. The two four-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. This alternative is expected to operate at LOS B in the year 2035.

For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles as a traffic-calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

Exhibit 1-4 Alternative 3: Three-Roundabout Interchange Design



2. Summary of Results

Pursuant to the conformity provisions of the Clean Air Act Amendments of 1990, this project will not cause or contribute to any new violation of any standard, or delay timely attainment of any standard or any required interim emission reduction. This project is examined as part of an Environmental Assessment; it is not considered to be a project that would cause significant regional air quality impacts from either the construction or operational phases of the project, and it meets regional-level air quality conformity requirements. All three of the Action Alternatives under consideration are expected to result in decreased congestion, benefit LOS at local intersections and nearby interchanges, and accommodate the projected increased traffic volumes.

Temporary air quality impacts may result from the construction of the Action Alternatives; impacts associated with the operation of the project would have a small (and generally positive) effect on air quality over the life of the project. Additionally, the project is located in a relatively rural area (see Exhibit 1-1). No sensitive receptors, residences, or crosswalks would be directly impacted as part of the Action Alternatives, so the likelihood of air quality issues is low.

3. Affected Environment

Construction of a new interchange at I-76 and Bridge Street is included in the conforming Statewide Transportation Improvement Plan (STIP), the 2012–2017 Denver Regional Council of Governments (DRCOG) Transportation Improvement Program (TIP), and the 2035 DRCOG Regional Transportation Plan (RTP), and is subject to CDOT oversight, as well as state and federal air quality compliance. The project is in an attainment/maintenance area for carbon monoxide (CO) and for particulate matter 10 micrometers in diameter and smaller (PM₁₀). Consideration of particulate matter 2.5 micrometers in diameter and smaller (PM_{2.5}) also is included in this technical report since it is a component of diesel exhaust, which would be associated with the equipment used during the construction phase of this project. Mitigation during construction activities to reduce particulate matter is discussed further in this report. Additionally, the project is in a nonattainment area for ozone (O₃).

Due to the status of these three pollutants in the Denver metropolitan area, and the fact that there is CDOT oversight, this project is subject to a conformity analysis. The project has state oversight because it has federal funding and is located on an interstate. Since this project is not considered a project that would cause significant regional air quality impacts, this technical report focuses in the following sections on an overall qualitative analysis of the regional criteria pollutants.

3.1 Regulatory Environment

3.1.1 Federal and State

National air quality policies are regulated through the federal Clean Air Act of 1970 (Act). As required by the Act, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for seven criteria air pollutants. In addition to O₃, CO, and PM₁₀, the criteria pollutants are PM_{2.5}, sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead (Pb) (see Exhibit 3-1). The NAAQS represent thresholds based on specific adverse health and welfare effects associated with each pollutant. The Colorado Department of Public Health and Environment (CDPHE) has adopted the NAAQS; there are no ambient air quality standards specific to Colorado.

Exhibit 3-1 National Ambient Air Quality Standards

Pollutant	Averaging Time ¹	NAAQS	
		µg/m ³	ppm
Ozone (O ₃)	8-Hour	—	0.0751
Carbon Monoxide (CO)	1-Hour	—	35
	8-Hour	—	9
Sulfur Dioxide (SO ₂)	3-Hour	—	0.5
Nitrogen Dioxide (NO ₂)	Annual	—	0.053
Particulate Matter (PM ₁₀) 5	24-Hour	150	—
Particulate Matter (PM _{2.5})	24-Hour	35	—
	Annual	12	—
Lead (Pb)	Rolling 3-Month Average	0.15	—

Source: EPA, 2013

Notes: ¹The 2008 standard

NAAQS = National Ambient Air Quality Standards

µg/m³ = micrograms per cubic meter

ppm = parts per million

The EPA has delegated authority to the CDPHE to administer many of the requirements of the Act, including compliance with the NAAQS. Within the CDPHE, the Air Pollution Control Division (APCD) oversees air quality policies. The State Implementation Plan (SIP) establishes emission limits for different categories of polluters, including motor vehicles, to avoid exceedances of the NAAQS. To comply with the SIP, Metropolitan Planning Organizations (MPOs) are required to demonstrate that transportation plans and programs keep emissions within these limits. This is done through the transportation conformity process per a Memorandum of Agreement (MOA) with the APCD and CDOT (CDOT, 1995).

If the level of any pollutant in an area exceeds the NAAQS, then the area is designated by EPA as a nonattainment area for that pollutant. The geographic boundaries of nonattainment areas are determined by the EPA in consultation with the CDPHE. Nonattainment areas are required to prepare individual implementation plans for attaining the standard for each pollutant. When an area has attained the NAAQS, a maintenance plan must be prepared to ensure that the standard will continue to be met. After the maintenance plan is approved by the EPA, the area is re-designated as an attainment/maintenance area.

3.1.2 CDOT Clearance Process

If the project is located in a nonattainment or attainment/maintenance area for one or more criteria pollutants, then a conformity determination must be made. The conformity regulations require that all transportation plans, transportation improvement programs, and transportation projects ensure that transportation activities will not cause or contribute to any new violation of any standard, increase the frequency or severity of existing violations of any standard, or delay timely attainment of any standard or any required interim emissions reductions (CDOT, 2013).

The FHWA and the Federal Transit Administration (FTA) control the federal funding of highway and transit projects and activities. Therefore, federal funding can only be approved for projects that comply with the conformity provision of the Act and the EPA transportation air quality conformity regulations (40 Code of Federal Regulations [CFR] 51 Subpart T, and 40 CFR 93 Subpart A). This means that the project must be included in a conforming TIP and RTP. The project design concept must be sufficiently defined to assess emissions at the time of the conformity determination. The design concept and scope of the project that was in place at the time of the TIP and RTP conformity findings must be maintained throughout implementation.

As the first step in a conformity determination, the CDOT Environmental Programs Branch air quality specialist and the APCD determine which roadways and signalized intersections will require an LOS analysis. This typically includes the signalized intersections that will be constructed, reconstructed, or modified as part of the project. Additionally, if the project could result in increased traffic at nearby intersections, those intersections also may need to be evaluated. An LOS analysis is completed for each intersection based on all project alternatives, including the No-Action Alternative. The LOS analysis assesses each intersection based on the average wait time per vehicle and assigns a letter “grade” to each intersection for the AM and PM peak-hour periods.

An additional analysis, “Hotspot Modeling,” is required for intersections with LOS of D or worse after project implementation. Hotspot modeling is a method of calculating the carbon monoxide concentrations along roadways and near intersections. The purpose of hotspot modeling is to evaluate whether a project could cause, or contribute to, a violation of the CO NAAQS.

Hotspot modeling also is required for particulate matter. Projects of air quality concern are certain highway and transit projects that involve significant levels of diesel vehicle traffic or any other project that is identified in a PM_{2.5} or PM₁₀ SIP as a localized air quality concern. Pursuant to 40 CFR 93.123(b)(2), particulate matter hotspot analyses are required for projects of air quality concern within non-attainment or attainment/maintenance areas.

3.1.3 Pollutants of Concern

When assessing the impacts of transportation projects, the two main pollutants of concern for the Denver metropolitan area—which includes Brighton—are CO and PM₁₀. The Denver area is designated as an attainment/maintenance area for these two pollutants. CO and PM₁₀ concentrations can accumulate near areas of heavy traffic congestion where average vehicle speeds are low. Ozone and mobile source air toxics (MSATs) are two more pollutants of concern and also are discussed below. Vehicle exhaust also includes emissions of PM_{2.5} and SO₂; however, these two compounds are not pollutants of concern in the Denver area.

Carbon Monoxide

The Denver area is currently considered to be in attainment/maintenance for CO. Per CDOT and FHWA guidance, quantitative hotspot modeling is required for intersections affected by the project that demonstrate an LOS of D or worse after project implementation.

For the purpose of this project, the LOS for the No-Action Alternative and all three Action Alternatives was examined in the I-76 and Bridge Street Interchange System-Level Study (SLS) (Atkins, 2013). The results of the SLS show that for the No-Action Alternative and any of the Action Alternatives, all signalized intersections in the project area would operate at LOS C or better during both the AM (morning) and PM (evening) peak-hour traffic in the year 2035 (Appendix A). The EPA modeling guidance states that intersections operating at LOS C or better are not likely to cause a violation of the federal 8-hour average CO standard. Therefore, hotspot modeling is not required and all of the alternatives are considered to meet regional-level air quality conformity requirements. Additionally, the nearby signalized intersection of Bridge Street and 50th Avenue would operate at LOS C or better during both the morning and evening peak-hour traffic in the year 2035 for the Action Alternatives (Appendix A). Therefore, it is not anticipated that this project would have a negative impact on surrounding signalized intersections.

Particulate Matter

Per 40 CFR 51.454(d), a PM₁₀ quantitative hotspot analysis must be performed for projects that are located at sites where violations have been identified by air quality monitoring, and at sites that have essentially identical vehicle and roadway emissions and dispersion characteristics. Nationally, PM₁₀ levels have been decreasing over the past 30 years (CDPHE, 2010). However, the overall levels of this pollutant in the northern Front Range have been fairly constant since 1997 (CDPHE, 2010).

The project area is within the attainment area for PM₁₀, but there have been no recent exceedances of NAAQS at the nearest air quality monitoring stations. According to the CDPHE Emission Inventories for

Adams County, the major sources of particulate matter in the project area are construction, road dust, and agricultural tilling (see Exhibit 3-2).

Exhibit 3-2 Adams County PM₁₀ Emissions for 2008

County	Three Highest Emission Categories Tons per Year (Percent of Total Tons/Year)			Total Tons of PM ₁₀ /Year
	Construction	Road Dust	Agricultural Tilling	
Adams	5,828 (30%)	4,933 (26%)	4,497 (23%)	19,205

Source: CDPHE, 2013

The requirement for a quantitative hotspot analysis took effect in December 2012 and is applicable to projects that demonstrate the potential to have major air quality impacts. Although this project has the potential to affect vehicle fleet mix within the project area, it would not have a significant increase in the number of diesel vehicles. Therefore, the project is below the PM₁₀ regulatory threshold for conducting a PM₁₀ hotspot assessment. The potential effects of this project were assessed qualitatively by evaluating the CDPHE Emissions Inventory. Based on this qualitative assessment, it was determined that this project would not have a major impact on local and regional air quality PM₁₀ emissions. Therefore, the EPA guidance to complete a quantitative analysis for PM₁₀ does not apply.

Ozone

The Denver area is currently in non-attainment for O₃ because 2007 O₃ levels exceeded the EPA 8-hour standard. This pollutant is not directly emitted by motor vehicles. However, the reaction of two pollutants found in motor vehicle emissions, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), contribute to O₃ formation. Ozone is created by the reaction of NO_x and VOCs, primarily on hot summer days. This reaction takes place over several hours, which allows for mixing and dispersion in the atmosphere; therefore, O₃ is generally a regional, rather than localized, pollutant. A transportation project can negatively affect regional air quality if vehicle emissions of O₃ precursors NO_x and VOCs increase as a result of the project.

In March 2008, the EPA established a more stringent standard for O₃ based on a review of the most recent health-effects information. The March 2008 standard is 0.075 parts per million (ppm) averaged over an 8-hour period. As with the 1997 standard, a violation of the standard occurs when the three-year average of the fourth maximum values at a monitor station exceeds the federal standard. In September 2008, CDPHE created an Ozone Action Plan intended to bring the Denver/North Front Range area back into attainment by November 2010 (CDPHE, 2008). The overall plan included elements that were part of the federally enforceable SIP, elements that are included as state-only enforceable measurements in state regulation, and elements that needed further evaluation prior to a possible SIP amendment in the future (CDPHE, 2008). The Ozone Action Plan did not bring the Denver/North Front Range area into attainment by November 2010.

In July 2012, the Denver area and the North Front Range were classified as a “marginal” O₃ nonattainment area by the EPA. The marginal nonattainment designation does not currently impose any new planning requirements on Colorado; however, the nonattainment areas must meet the standard before 2015 or new requirements may be imposed.

Mobile Source Air Toxics

In addition to the criteria air pollutants, for which there are NAAQS, the EPA also regulates air toxics, including MSATs, which are a subset of the 188 air toxics defined by the Clean Air Act. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (such as trains), area sources (such as dry cleaners), and point sources (such as factories or refineries). Some toxic compounds present in fuel are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

Studies have reported that proximity to roadways is related to adverse health outcomes, particularly respiratory problems. Much of this research is not specific to MSATs, but instead includes the full spectrum of both criteria and other pollutants. The validity of these studies cannot be evaluated at this time, but—more importantly—these studies do not provide information that would be useful to alleviate the uncertainties associated with the studies and enable a more comprehensive evaluation of the health impacts specific to this project. Because of the uncertainties associated with the studies, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level.

4. Impact Analysis

For each alternative examined in the EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or vehicle miles of travel (VMT), assuming that other variables—such as fleet mix—are the same for each alternative. The VMT estimated for each of the Action Alternatives is slightly higher than that for the No-Action Alternative because the interchange may attract trips from alternative routes nearby. This increase in VMT means MSATs under any of the three Action Alternatives would probably be higher than the No-Action Alternative in the project area. There also could be localized differences in MSATs from indirect effects of the project, such as associated access traffic, emissions of evaporative MSATs (e.g., benzene) from parked cars, and emissions of diesel particulate matter from delivery trucks. The indirect localized differences in MSATs are not expected to be measurable in the project area and, therefore, would not impact project-level MSAT emissions. Traffic volumes at other nearby interchanges could be reduced due to a shift in travel patterns to use the proposed interchange; this would result in a decrease in emissions at those locations.

Because the estimated VMTs under each of the three Action Alternatives are nearly the same, varying by less than two percent, it is expected there would be no appreciable difference in overall MSAT emissions among the three Action Alternatives. Additionally, for any of the alternatives, emissions are virtually certain to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by more than 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future than they are today. Future truck percentages are expected to remain the same as those measured during existing conditions (Atkins, 2013). Therefore, particulate matter impacts for additional truck traffic are not expected to occur from any alternative.

The addition of travel lanes as part of the project alternatives will have the effect of moving some traffic closer to the nearby residential community southwest of the project area (see Exhibit 1-1); therefore, under each alternative, there may be localized areas where ambient concentrations of MSATs would be higher under certain alternatives than others. The localized differences in MSAT concentrations would likely be most pronounced along the new/expanded roadway sections that would be built at I-76 and Bridge Street, under any of the Action Alternatives. However, the magnitude and the duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSATs health impacts. Further, under any of the alternatives, including the No-Action Alternative, overall future MSATs are expected to be substantially lower than today due to implementation of EPA's vehicle and fuel regulations.

5. Mitigation

Although motor vehicle emissions in the project area may increase, they are not expected to result in an exceedance of the NAAQS; therefore, no air quality mitigation is necessary. However, since the construction of the project will require submittal of an Air Pollution Emission Notice and Application for Construction

Permit from the APCD, preparation of a Fugitive Dust Control Plan will be required. Adherence to this plan will reduce air pollution resulting from construction activities.

Construction phase air quality impacts (fugitive road dust and engine exhaust emissions) will be controlled by implementing the following measures, as applicable:

- Wetting exposed soils and soil piles for dust suppression
- Covering trucks hauling soil and other fine materials
- Stabilizing and covering stockpile areas
- Re-vegetating exposed areas
- Minimizing off-site tracking of mud and debris by washing construction equipment and temporary stabilization
- Limiting vehicle speed of construction-related equipment when off road
- Prohibiting unnecessary idling of construction equipment
- Using low-sulfur fuel
- Locating diesel engines and motors as far away as possible from residential areas
- Locating staging areas as far away as possible from residential areas
- Requiring heavy construction equipment to use the cleanest available engines or to be retrofitted with diesel particulate control technology
- Using alternatives for diesel engines and/or diesel fuels (such as biodiesel, liquefied natural gas, compressed natural gas, fuel cells, or electric engines) when possible
- Installing engine pre-heater devices to eliminate unnecessary idling during winter time construction
- Prohibiting tampering with equipment to increase horsepower or to defeat the effectiveness of emission control devices
- Requiring construction vehicle engines to be properly tuned and maintained
- Using construction vehicles and equipment with the minimum practical engine size for the intended job

6. Conclusions

This project is being evaluated as an EA; it is not considered to be a project that would cause significant regional air quality impacts and it meets regional-level air quality conformity requirements. All of the Action Alternatives are expected to result in decreased congestion, operate at LOS C or better during both the AM and PM peak periods, and are anticipated to be able to accommodate projected increased traffic volumes. All three of the Action Alternatives under consideration also are expected to result in decreased congestion and benefit LOS at local intersections and nearby interchanges. Based on the qualitative analysis of CO and PM₁₀ data, no exceedances of the NAAQS are expected as a result of this project. The project is located in a relatively rural area (see Exhibit 1-1). No sensitive receptors, residences, or crosswalks would be directly impacted as part of the Action Alternatives; therefore, the likelihood of air quality issues is low.

7. References

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- U.S. Environmental Protection Agency (EPA), 2013. National Ambient Air Quality Standards (NAAQS), Website: <http://www.epa.gov/air/criteria.html>. Accessed December 2013.

Appendices

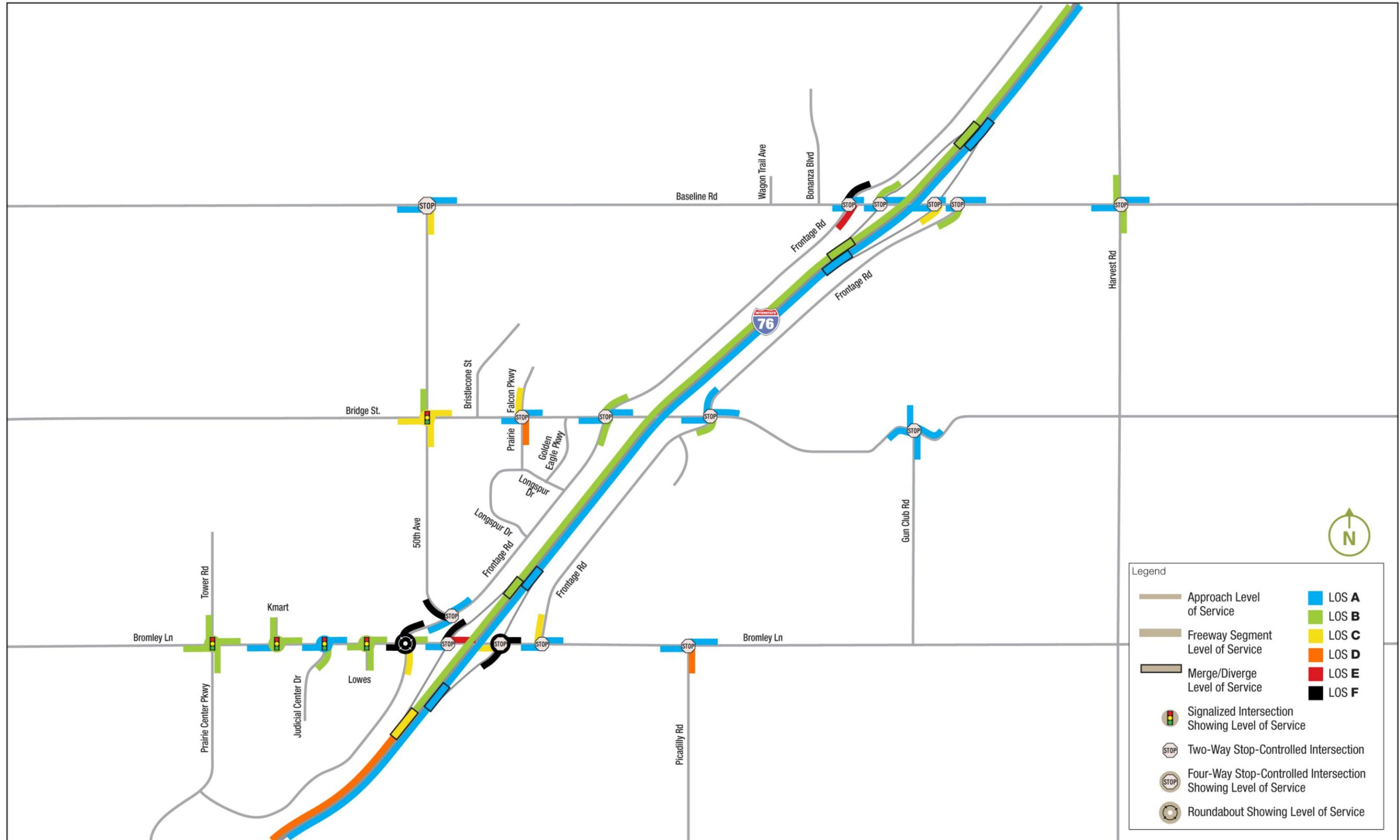
Appendix A: I-76 and Bridge Street Interchange 2035 Conditions

Appendix A

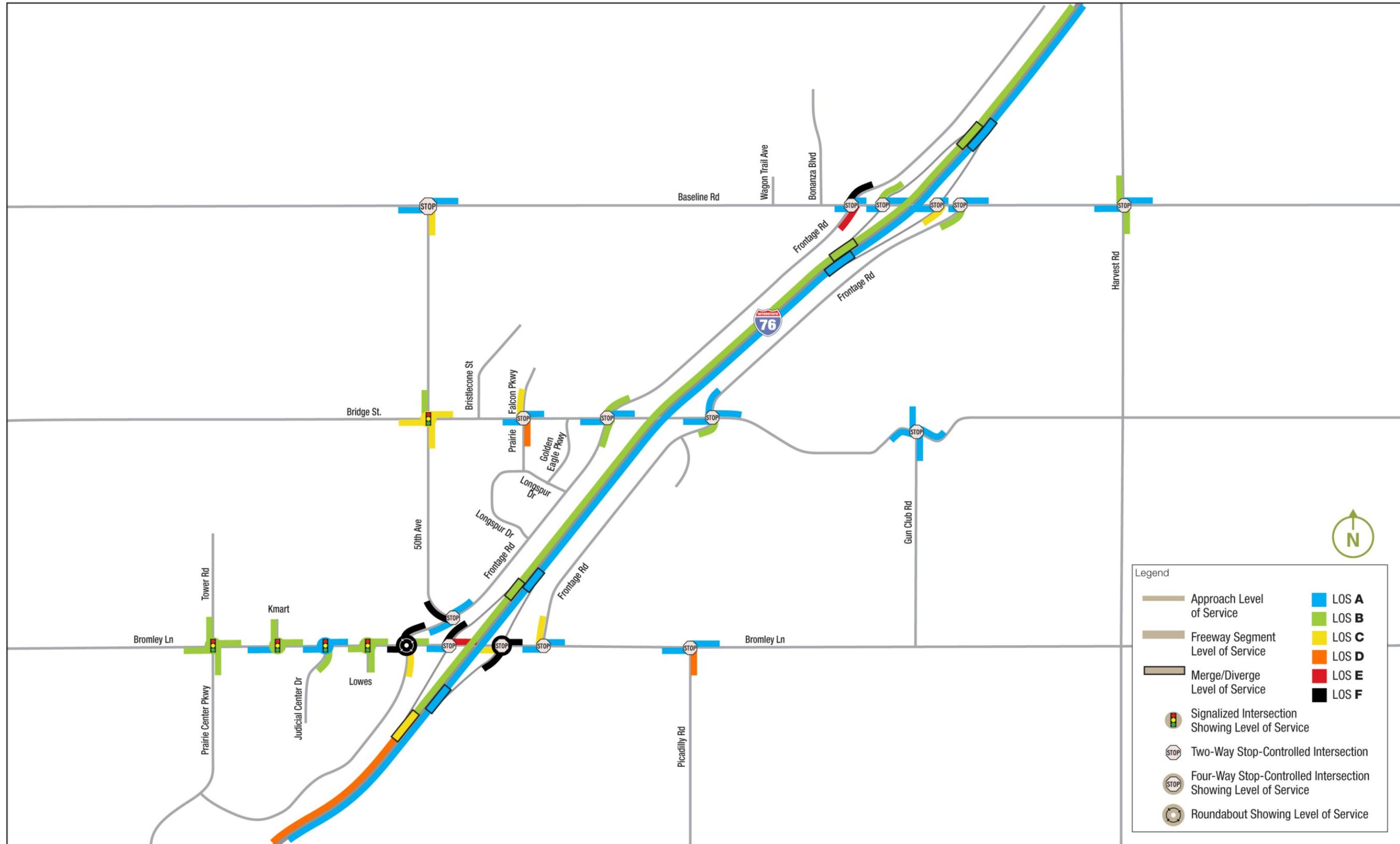
Air Quality Technical Report

I-76 and Bridge Street Interchange
2035 No-Action Alternative and Action
Alternatives LOS Conditions

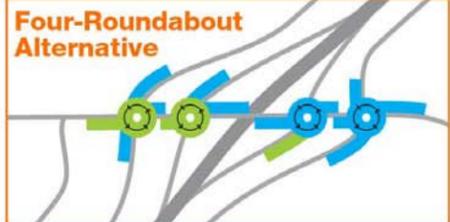
2035 No-Action Alternative AM LOS



2035 No-Action Alternative PM LOS







Interchange Alternatives

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every receipt, invoice, and bill should be properly filed and indexed for easy retrieval. This not only helps in tracking expenses but also ensures compliance with tax regulations.

Next, the document outlines the process of reconciling bank statements. It advises comparing the bank's records with the company's internal accounting records to identify any discrepancies. Regular reconciliation is crucial for detecting errors and preventing fraud.

The following section covers the preparation of financial statements. It details the steps involved in calculating net income, determining the cost of goods sold, and preparing the balance sheet and income statement. The document provides clear instructions on how to use accounting software to streamline these processes.

Finally, the document discusses the importance of regular audits. It explains that audits help in identifying areas for improvement, ensuring the accuracy of financial data, and maintaining transparency. The document also provides a checklist for conducting an internal audit.



Traffic Noise

Technical Report

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List of acronyms and abbreviations

BMP	Best management practice
Brighton	City of Brighton
CDOT	Colorado Department of Transportation
CFR	Code of Federal Regulations
dB	Decibel
dBA	A-weighted decibels
EA	Environmental Assessment
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
Leq	Equivalent sound level
Leq(h)	Equivalent sound level per hour
LOS	Level of service
mph	Miles per hour
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
ROW	Right of way
TNM	Traffic Noise Model
USC	United States Code
vph	Vehicles per hour

1. Introduction

The I-76 and Bridge Street Interchange Environmental Assessment (EA) is a joint effort between the City of Brighton (Brighton), the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT). This EA will identify potential impacts of the proposed interchange on the human and natural environment.

1.1 Project Description

The City of Brighton proposes constructing a new interchange at I-76 and Bridge Street in eastern Brighton. The project is located in Adams County, Colorado, approximately 25 miles northeast of Denver. The noise study area is defined as the area surrounding the existing Bridge Street overpass over I-76, including the interstate, the frontage roads, and Bridge Street. The area surrounding the intersection of Bridge Street & Prairie Falcon Parkway is also included in the noise study area, where a signal is proposed as part of the project (Exhibit 1-1).

Exhibit 1-1. Noise Study Area



The purpose of the project is to increase local and regional east-west connectivity, reduce the amount of travel delay through the future design year of 2035, and improve traffic flow and access in the study area. The need for the project results from the lack of local and regional connectivity, current and projected congestion and associated travel delay, and poor current and future traffic flow on the frontage roads.

The proposed interchange provides an opportunity to increase regional east-west connectivity that will become increasingly important with future population growth and increased travel demand.

1.2 Resource Definition

Noise generally is defined as unwanted or undesirable sound. Noise typically affects humans in three different ways: noise intensity or level, noise frequency, and noise variation with time. Proposed alterations to the highway system, including the construction of a new interchange, require an assessment of project impacts on noise intensity due to traffic.

Noise intensity, or loudness, is determined by how sound pressure fluctuates and is expressed in decibels (dB). The range of noise normally encountered can be expressed by values between 0 and 120 dB on the dB scale. A 3-dB change in sound level generally represents a barely noticeable change in noise level, whereas a 10-dB change typically would be perceived as a doubling of loudness. The frequency of noise is related to the tone or pitch of the sound and is expressed in terms of cycles per second or Hertz. The human ear can detect a wide range of frequencies, from approximately 20 Hertz to 17,000 Hertz. Because human sensitivity to sound varies from person to person, the A-weighting system is commonly used when measuring noise to provide a value that represents human response. Noise levels measured using this system are called A-weighted levels, and are expressed as dBA.

Because noise fluctuates during the course of a day, it is common practice to condense all of this information into a single number, known as an equivalent sound level (Leq). Leq represents an average sound level over a specified time period (typically 60 minutes), and the value then reflects the hourly equivalent sound level, or Leq(h).

1.3 Regulatory Environment

This section discusses applicable laws, regulations, and guidance as they pertain to the analysis of traffic noise in this EA.

1.3.1 National Environmental Policy Act

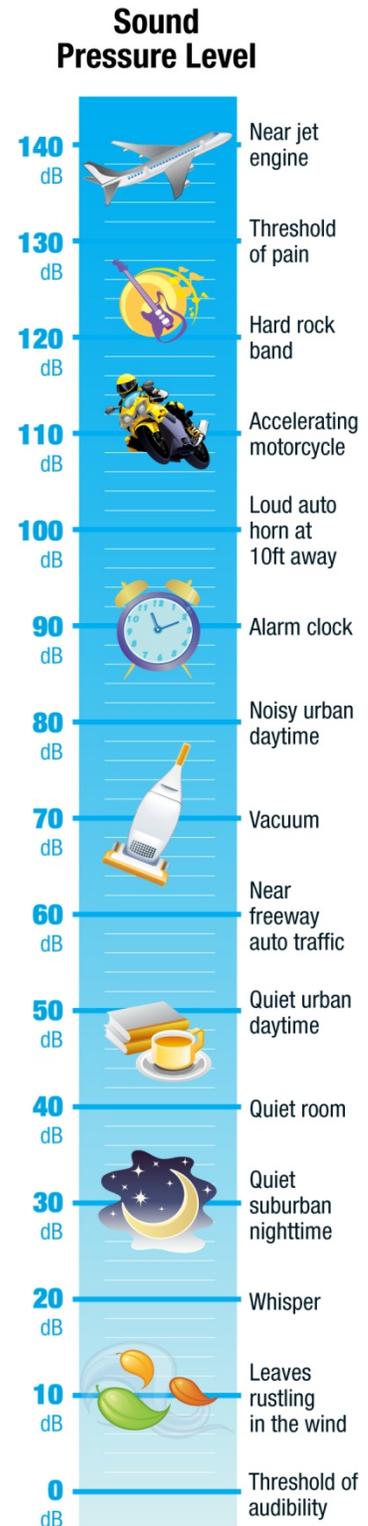
The National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code (USC) §4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that transportation project decisions involving federal actions consider social, economic, and environmental factors in the decision-making process. NEPA also requires that agencies making these decisions consult with other agencies, involve the public, disclose information, and prepare a detailed statement of environmental effects of a reasonable range of alternatives.

1.3.2 Procedures for Abatement of Highway Traffic Noise and Construction Noise

Title 23 CFR §772 codifies procedures for considering noise studies in NEPA and federal-aid processes and establishes requirements for transferring traffic noise information to local planning agencies to assist in their land use planning activities.

1.3.3 FHWA Measurement of Highway-Related Noise

FHWA's *Measurement of Highway-Related Noise* (1996) provides a uniform guidance reference for highway noise practitioners and researchers. The manual addresses measurement and analysis instrumentation, site selection, measurement procedures, data reduction, and analysis techniques.



1.3.4 CDOT Noise Analysis and Abatement Guidelines

CDOT's *Noise Analysis and Abatement Guidelines* (2013) serves to implement FHWA noise regulations for CDOT projects. It provides guidance on conducting traffic noise studies, analyzing abatement options, investigating construction noise levels, and coordinating noise-level information with local land use planning officials.

2. Affected Environment

2.1 Study Area

The study area is comprised of land uses typically found in suburban areas, including residential and commercial uses to the west of I-76 and industrial land uses to the east of I-76. Several residential neighborhoods are established west of I-76 along Bridge Street toward 50th Avenue. Future development is expected as new residential units are planned to the west of I-76, including the Brighton Crossing master planned community. At full build-out, the community expects to have more than 3,000 homes, townhomes, condominiums, and apartments.

2.2 Noise-Sensitive Land Uses in the Study Area

Noise-sensitive sites are defined as any location where traffic noise may be adverse to the function and outdoor enjoyment of a property. CDOT and FHWA have established noise thresholds at which noise abatement must be considered for various types of noise-sensitive sites. These noise levels are referred to as the Noise Abatement Criteria (NAC). As presented in Exhibit 2-1, NAC vary according to the land use activity category.

A traffic noise impact can occur under either of the following two separate criteria:

- Predicted traffic noise levels meet or exceed the NAC
- A substantial noise increase of 10 dBA over existing conditions is predicted

To adequately assess the noise impact of a proposed project, both criteria must be analyzed. If impacts are identified, noise abatement measures must be considered and implemented if they are determined to be both feasible and reasonable.

The noise study area is comprised mainly of NAC B (residential) areas. The NAC B receptors occur on the west side of I-76. There is an industrial building that is located east of I-76 and south of Bridge Street, which is an NAC F land use. It was not included in the model because it has no impact criteria, as shown in Exhibit 2-1.

Exhibit 2-1 CDOT Noise Abatement Criteria

Activity Category	Activity $L_{eq}(h)$ (dbA)	Description of Land Use Activity Category
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	51 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	N/A	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing.
G	N/A	Undeveloped lands that are not permitted for development.

Source: CDOT 2013

2.3 Methodology

The existing conditions noise analysis was performed in accordance with the requirements of 23 CFR §772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, using methodology established by CDOT's Noise Analysis and Abatement Guidelines. Predicted noise levels were produced using the FHWA Traffic Noise Model (TNM) 2.5. All measured and predicted noise levels are expressed in dBA using A-weighting. The hourly equivalent noise levels are defined as the equivalent average sound level that, in a given hourly period, contains the same acoustic energy as the time-varying sound for the same hourly period.

Noise from traffic emanates from four primary sources: the tire/road interface, engines, aerodynamics, and exhaust stacks. Each of these is considered in the TNM 2.5 model. The dBA weighted numbers are used to determine the effect upon potential noise-sensitive sites.

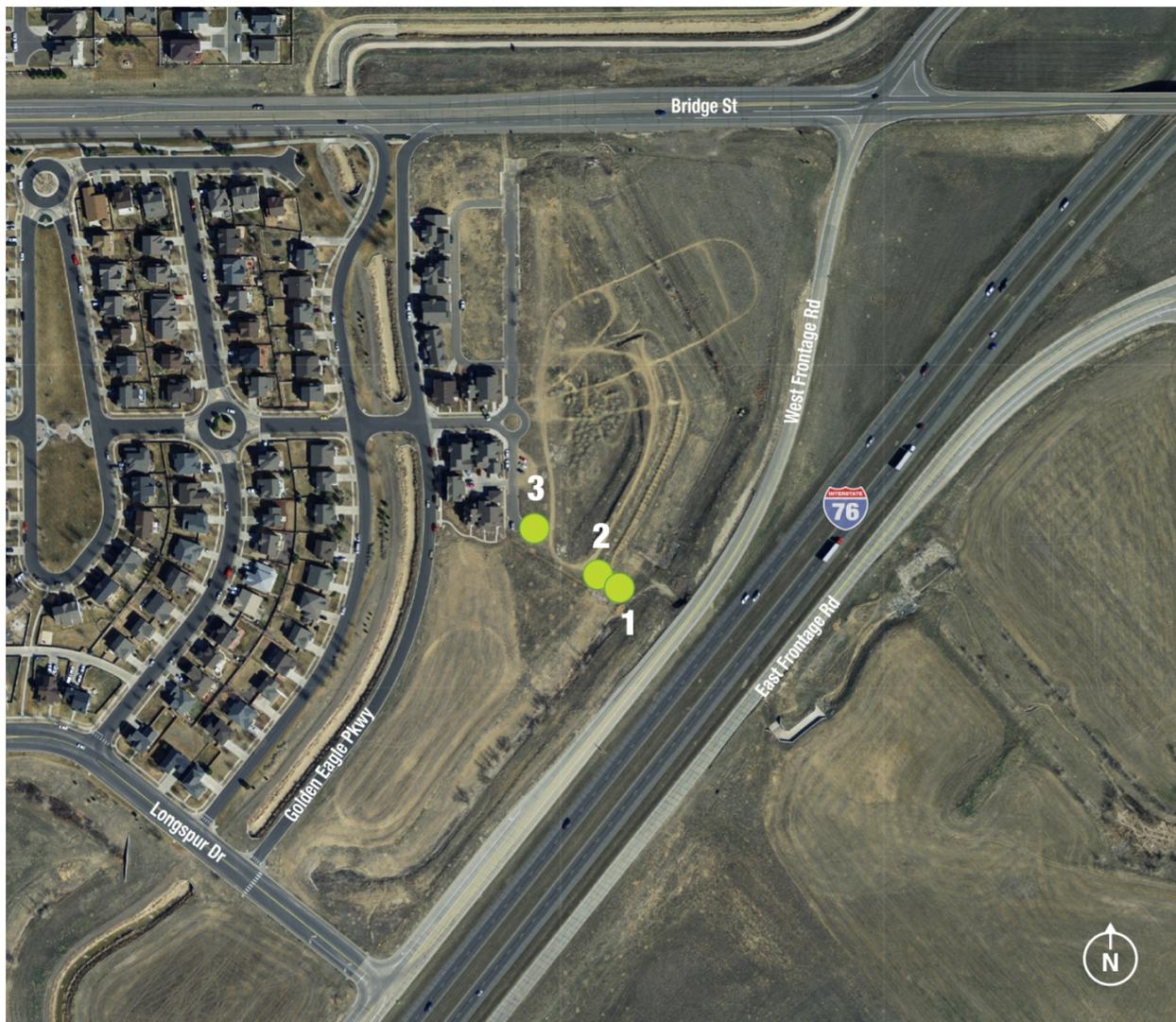
2.3.1 Noise monitoring

To validate the computer noise model (see the following section), field measurements were taken within the study area following procedures documented in FHWA's *Highway Traffic Noise: Analysis and Abatement Guidance*. Field measurements were obtained using Larson Davis 812 and Larson Davis 712 Sound Level Meters. Meters, microphones, and calibrators are calibrated to factory settings at Larson Davis's Utah lab annually. Monitoring events need to last 10 or more minutes. For this project, 10 minutes was chosen as the monitoring time increment because traffic was consistent in the study area. The noise meters were calibrated using a Larson Davis sound level calibrator daily before measurements were collected. No 24-hour noise readings were conducted.

Data collection efforts focused on noise-sensitive dwelling units within the NAC B land uses in the study area. No interior readings were taken. Within the study area, there are two neighborhoods that have NAC B land use within 500 feet of I-76. One neighborhood, called Bromley Park, is located west of I-76 and south of Bridge Street, extending to 50th Avenue. The second neighborhood, called Brighton Crossing, is located west of I-76 and north of Bridge Street, extending to 50th Avenue.

Noise measurements were taken at three locations up to 500 feet from the edge of pavement of I-76, as shown in Exhibit 2-2. Noise measurements were not taken immediately adjacent to Bridge Street because I-76 is the main source of noise for the nearby dwelling units. The closest readings occurred approximately 100 feet and 150 feet from the highway edge of pavement and were used to validate the model. Additional noise measurements were taken approximately 350 feet from the same edge of pavement, which were used for general ambient noise monitoring. Field data collection and verification was used to determine additional features, such as buildings, terrain, or barriers to add into the noise model.

Exhibit 2-2 Noise Monitoring Locations



2.3.2 TNM model validation

Field validation measurements were conducted in the vicinity of noise-sensitive sites, where safe access to monitoring sites existed, where a representative sampling of free-flow traffic could be obtained, and where roadway geometry remained relatively constant.

For the model validation, two 10-minute counts were collected at each site. Traffic counts were performed with handheld counters at the time of monitoring, for traffic on I-76 and the frontage roads, which were used to validate the existing conditions model in TNM. Vehicle types were separated into three categories: cars, medium trucks, and heavy trucks. Vehicle speeds were estimated and recorded during the noise measurements to ensure proper model validation. Data collection occurred mid-afternoon when drivers on I-76 were driving at or near free-flow speeds. The CDOT *Noise Analysis and Abatement Guidelines* state that field measurements can be taken at any time, however it is best to measure when traffic is relatively free-flowing at or near the posted speed limit. Directional counts of all automobile, medium truck, and heavy truck traffic should be taken for relevant roadways adjacent to the measurement site. Traffic counts were taken for both directions of I-76 and both the east and west frontage roads.

Model validation data were collected within 350 feet of the highway edge of pavement. The noise monitoring occurred at three sites adjacent to I-76. Validation occurs when measured noise levels are within 3 dBA of the modeled value. Exhibit 2-3 summarizes the model validation counts and the additional noise readings collected within the study area. Although still within the acceptable threshold for validation, Point 2 had a 2.9 dBA difference between the field reading and the model result. The difference at this location could be a result of the noise model not being able to adequately calculate noise levels between multiple terrain lines, as Point 2 lies on the slope leading down to the existing ditch to the west of the frontage road. There were several terrain lines added in the vicinity of Point 2 to represent the ditch, but the fact that Points 1 and 3 calibrated within less than 1 dBA indicates that the model is still validated. All of the dwelling units that were included in the model are located even further beyond the ditch, so the model was considered valid. Details of the field measurements taken in September 2013 can be found in Appendix A.

Exhibit 2-3 Study Area Model Validation Counts and Noise Readings

Point	Distance from Edge of Pavement (ft)	Field Reading (dB(A))	Model Result (dB(A))	Difference (dB(A))
1	115	65.4	64.7	0.7
2	165	64.9	67.8	-2.9
3	350	62.6	62.1	0.5

2.3.3 Existing conditions worst noise hour

Based on CDOT's *Noise Analysis and Abatement Guidelines*, 66 dBA was used as the threshold noise level in the analysis of the existing conditions in the study area for the NAC B land uses (Exhibit 2-1).

Noise studies typically use the loudest noise conditions in determining the noise levels. The loudest or worst noise hour is the hour with the highest volume of traffic traveling at the fastest, congestion-free speeds. The existing noise conditions range from 45 dBA to 62 dBA. Worst-case conditions on the I-76 mainline and all other roadway segments included in the model were determined to occur during the PM peak period, and those volumes were used in the noise model. For roadway links that experience a less than optimal Level of Service (LOS) rating of LOS D, LOS E, or LOS F during the peak hours of the day, the "worst noise hour" as recommended in Exhibit 4 of the CDOT *Noise Analysis and Abatement Guidelines* can be referenced, which is summarized in the "maximum traffic volumes" column of Exhibit 2-5. Since none of the roadway segments included in the model experienced less than optimal LOS ratings, the actual traffic volumes were used, as shown in Exhibit 2-4. For the I-76 noise analysis, all of I-76 was modeled with a speed of 75 miles per hour (mph), all ramps and frontage roads were modeled with a speed of 50 mph, collector streets and arterials

were modeled with a speed of 40 mph or 55 mph, depending on the location, and residential streets were modeled with a speed of 25 mph. Six-legged roundabouts were modeled with a speed of 20 mph, and four-legged roundabouts were modeled with a speed of 15 mph. Daily and hourly volumes as well as truck percentages were collected in September 2013.

Traffic volumes on local streets were not considered in the model because the low speeds of the roadways and the low traffic volumes do not contribute significantly to the overall noise level experienced by the dwelling units.

Exhibit 2-4 Traffic Volumes

Traffic Volumes by Segment							
Roadway Segment	Direction	Existing		2035 No Action Alternative		2035 Action Alternatives	
		PM Peak Hour Volume (vph)	Vehicle Distribution (Cars/Medium Trucks/Heavy Trucks) (%)	PM Peak Hour Volume (vph)	Vehicle Distribution (Cars/Medium Trucks/Heavy Trucks) (%)	PM Peak Hour Volume (vph)	Vehicle Distribution (Cars/Medium Trucks/Heavy Trucks) (%)
I-76 between Bromley and Baseline	EB	1075	85/10/5	1910	85/10/5	N/A	N/A
	WB	855		1110		N/A	N/A
I-76 south of ramps	EB	N/A	N/A	N/A	N/A	2340	88/10/2
	WB					1510	
I-76 between ramps	EB	N/A	N/A	N/A	N/A	1815	88/10/2
	WB					1060	
I-76 north of ramps	EB	N/A	N/A	N/A	N/A	1915	88/10/2
	WB					1160	
I-76 ramps	EB On	N/A	N/A	N/A	N/A	100	88/10/2
	EB Off					525	
	WB On	N/A	N/A	N/A	N/A	450	88/10/2
	WB Off					100	
Bridge Street west of Prairie Falcon Parkway	EB	260	88/10/2	400	88/10/2	490	88/10/2
	WB	275		410		500	
Bridge Street west of West Frontage Rd to Prairie Falcon Parkway	EB	260	88/10/2	255	88/10/2	460	88/10/2
	WB	200		330		550	
Bridge Street between East and West Frontage Rd	EB	110	88/10/2	125	88/10/2	185	88/10/2
	WB	110		130		590	
Bridge Street east of East Frontage Rd	EB	35	88/10/2	95	88/10/2	160	88/10/2
	WB	75		45		95	

Traffic Volumes by Segment							
Roadway Segment	Direction	Existing		2035 No Action Alternative		2035 Action Alternatives	
		PM Peak Hour Volume (vph)	Vehicle Distribution (Cars/Medium Trucks/Heavy Trucks) (%)	PM Peak Hour Volume (vph)	Vehicle Distribution (Cars/Medium Trucks/Heavy Trucks) (%)	PM Peak Hour Volume (vph)	Vehicle Distribution (Cars/Medium Trucks/Heavy Trucks) (%)
Prairie Falcon Parkway north of Bridge Street		136	94/5/1	394	94/5/1	533	94/5/1
Prairie Falcon Parkway south of Bridge Street		92	94/5/1	106	94/5/1	109	94/5/1
West Frontage Road north of Bridge Street		290	91/6/3	350	91/6/3	125	91/6/3
West Frontage Road south of Bridge Street		250	91/6/3	285	91/6/3	105	91/6/3
East Frontage Road north of Bridge Street		60	91/6/3	60	91/6/3	30	91/6/3
East Frontage Road south of Bridge Street		105	91/6/3	180	91/6/3	105	91/6/3

Exhibit 2-5 Maximum Modeled Traffic Volumes for Worst Noise Hour

Posted Speed Limit (MPH)	Maximum Traffic Volumes by Facility Type (vehicles/lane/hour)		
	Freeway	Non-Freeway Multiple Lane	Two-Lane Roadway
75 or above	1,600	N/A	N/A
70	1,700	N/A	N/A
65	1,800	1,700	1,300
60	1,900	1,800	1,300
55	2,000	1,900	1,300
50	2,100	2,000	1,400
45	2,200	2,100	1,500
40	N/A	2,200	1,600
35 or below	N/A	2,200	1,600

Source: CDOT 2013

3. Impact Analysis

Traffic-generated noise levels for the future action conditions were calculated using TNM 2.5 for the 2035 design year. Model inputs included the proposed roadway alignments, traffic volumes, vehicle speed, and truck percentages. To closely model the undulating terrain in the study area, topographic information based

on one-foot contours was added to the model. Building rows were added to the model to represent the rows of houses along Bridge Street and on either side of Prairie Falcon Parkway.

Results of the noise models are discussed in Section 4.2. In general, the 2035 Leq(h) values of the receptors within the study area are expected to range from 49 dBA to 65 dB(A) for the Action Alternatives, with an average of 54.8 dBA. Based on the results of the model, noise impacts are not expected to occur at any receptor for the 2035 Action Alternatives.

3.1 Modeling Procedures

The assessment of noise effects from traffic operations is based on a comparison of existing and projected future noise exposure for noise-sensitive land use categories. The following subsections describe the procedures followed for the noise effects analysis.

3.1.1 Noise prediction model

FHWA's TNM 2.5 was used for all traffic noise modeling. This software is required for all noise analysis per the ruling in 23 CFR §772. TNM calculates traffic noise levels based on input for the worst noise hour traffic volumes, operating speeds, and surrounding environmental characteristics. This information then is used to determine if dwelling units meet or exceed the established noise criteria.

3.1.2 Shielding

Shielding can be assigned to receptors as needed on the corridor by using building rows, barriers, or terrain lines in TNM. This determination is made based on the difference between noise readings collected during data collection and the model output. Terrain lines were added to the model to represent the berm and varying terrain south of Bridge Street and west of the Frontage Road. Building rows were added to the model to represent the rows of houses along Bridge Street and on either side of Prairie Falcon Parkway. The building percentage was calculated for each building row using the total length of all the buildings divided by the total length of the building row. The building percentages ranged from 70% to 80%.

3.1.3 Placement of receptors

The receptor location was placed in the middle of the property closest to the noise source, unless there was an apparent area of frequent outdoor human use. In locations with multiple dwelling units clustered together (such as a densely populated residential neighborhood), dwelling units were grouped to represent up to 10 dwelling units rather than modeling every property on the corridor. All receptors with NAC B land use within 500 feet of the highway edge of pavement (existing or proposed) were included in the model. A signal is proposed at the intersection of Bridge Street and Prairie Falcon Parkway as part of the project, so all receptors with the NAC B activity category within 500 feet of the edge of pavement (existing or proposed) were also included in the model. Areas of future planned development were identified on the west side of I-76, both north and south of Bridge Street. However, no building permits have been issued for any of these parcels, therefore the parcels were not included in this noise study.

All of the residential receivers that were included in the noise models are shown in Exhibit 3-1. Exhibit 3-2 shows the detailed information for the residential receivers, with the corresponding receiver numbers.

Exhibit 3-1. Noise Receivers Included in TNM

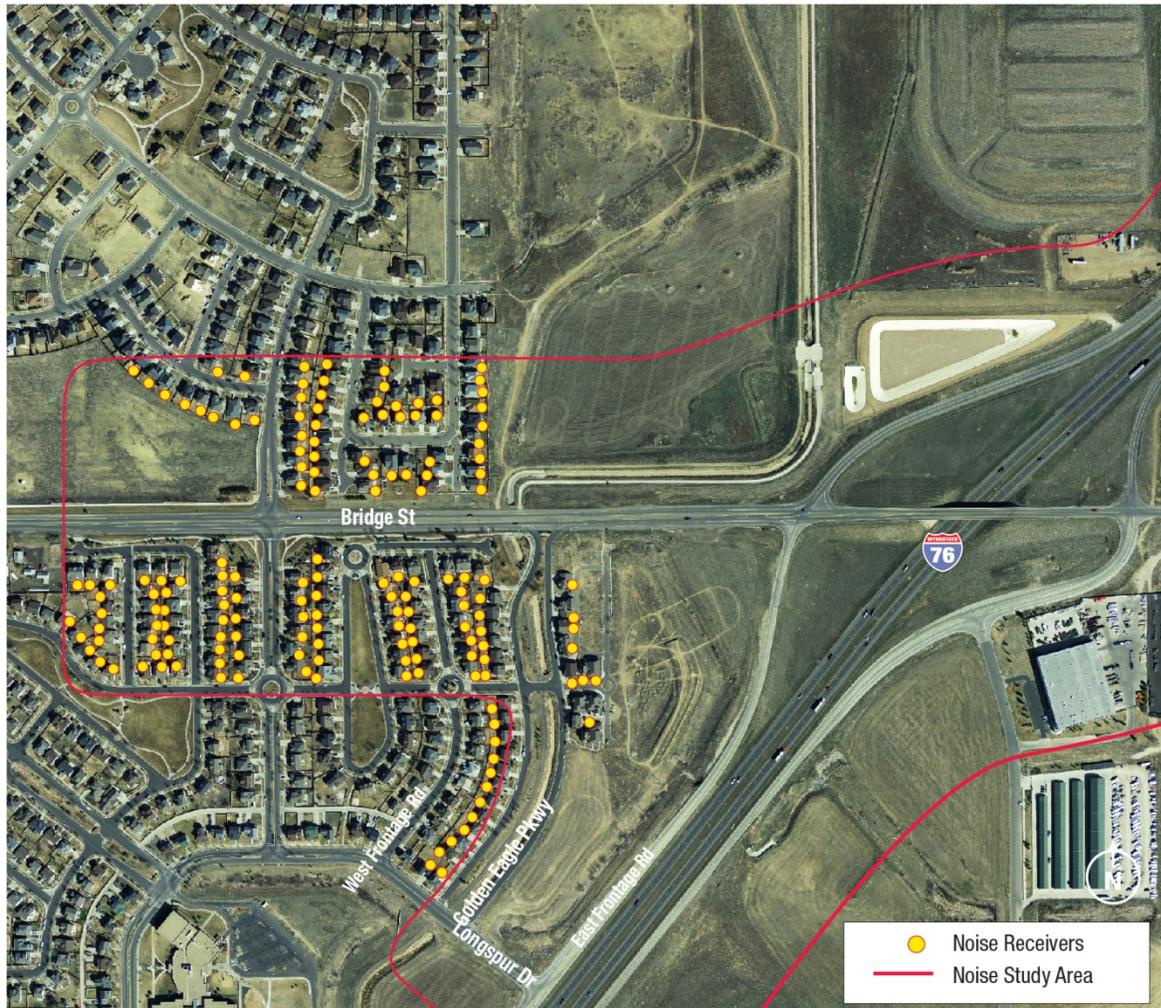
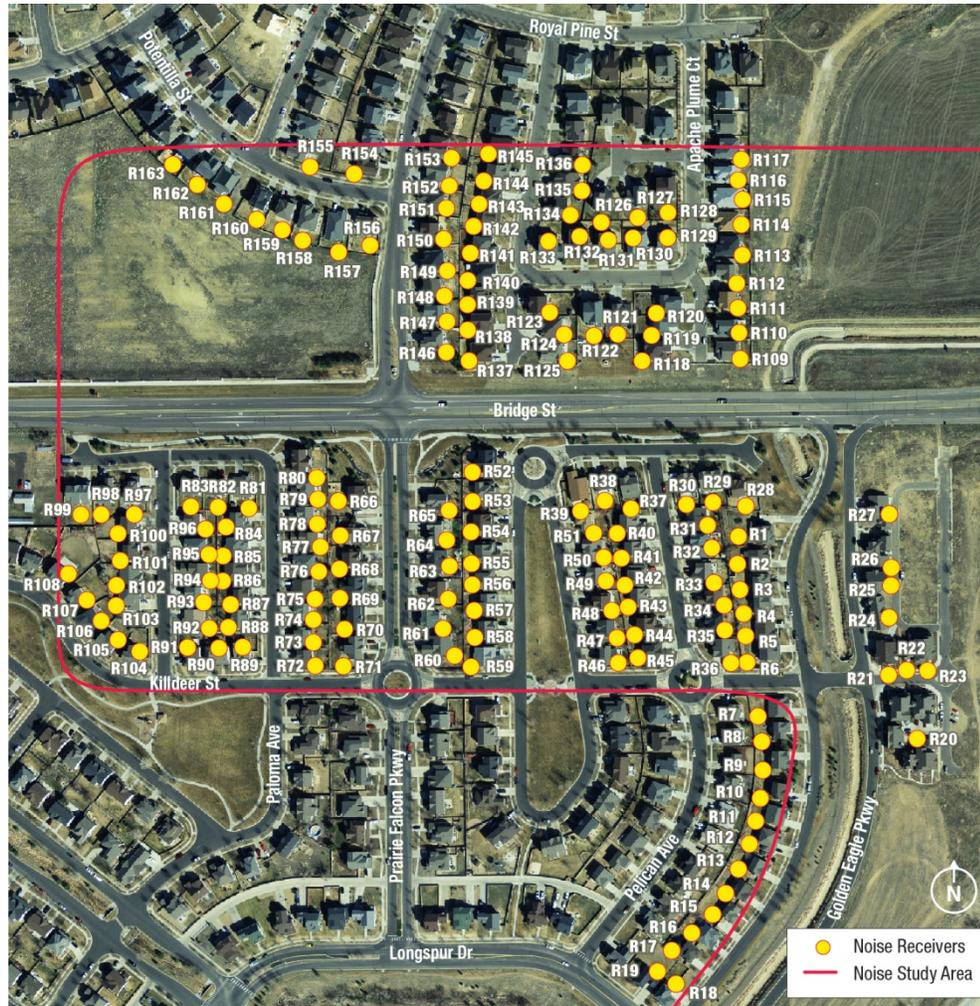


Exhibit 3-2. Detailed Noise Receiver Information



3.1.4 Traffic and speed

As discussed previously, noise monitoring was conducted during worst-case noise conditions. The same is true for modeling. Worst-case conditions on the I-76 mainline and all other roadway segments in the model were determined to occur during the PM peak period, and those volumes were used in the noise model. Exhibit 2-4 provides the volume and vehicle distribution assumptions for the traffic noise modeling. Truck percentages were determined based on values provided in the System-Level Study report which was submitted in September 2013.

3.1.5 Input data

Accurate vertical and horizontal data for roadways, receivers, existing noise walls, existing berms, and jersey barriers were needed for noise modeling. Microstation, geographic information system (GIS), and field reviews were used to provide accurate vertical/horizontal data for all features.

3.1.6 Number of lanes in TNM model

In cases where there are multiple lanes of travel, up to three lanes having the same traffic characteristics may be combined in the model as one roadway segment per direction of travel. Currently, I-76 has two lanes in each direction, so only one roadway segment was needed for each direction of I-76 in the model. Two-lane ramps, frontage roads, collector streets, and arterials were modeled as one roadway segment in TNM.

The roadway segment was modeled down the center of both lanes for a two-lane section or in the center of the lane for a one-lane section. Residential streets were modeled as one roadway segment in TNM, placed in the center between the two directions of travel, to represent both directions of travel.

3.1.7 Modeling years

Traffic-generated noise levels for the future action conditions were calculated for the 2035 future design year. The existing conditions used 2013 traffic volumes.

3.1.8 Alternatives to be modeled

The existing conditions were modeled under the current configuration, with 2013 traffic volumes, to serve as a baseline for a substantial noise increase in future years. The 2035 model was used to model the No-Action Alternative, as well as the three Action Alternatives. The three Action Alternatives are discussed in more detail in upcoming sections.

3.1.9 Interchange modeling

The 2035 model did not include an interchange at Bridge Street for the No-Action Alternative. For the three Action Alternatives, an interchange at Bridge Street was modeled using the specific design associated with each alternative.

3.1.10 Arterial streets/alternate corridors

The traffic noise model included noise-sensitive areas along Bridge Street within 500 feet of I-76 and the frontage roads, and within 500 feet of the intersection of Bridge Street and Prairie Falcon Parkway.

3.1.11 Rounding

Noise values were rounded to the nearest whole number when reporting existing and future noise volumes, per Section 4.6 of the CDOT Noise Analysis and Abatement Guidelines. For cost-benefit calculations, all values were calculated to one tenth of a decimal point, as they are reported in TNM.

3.2 No-Action Alternative

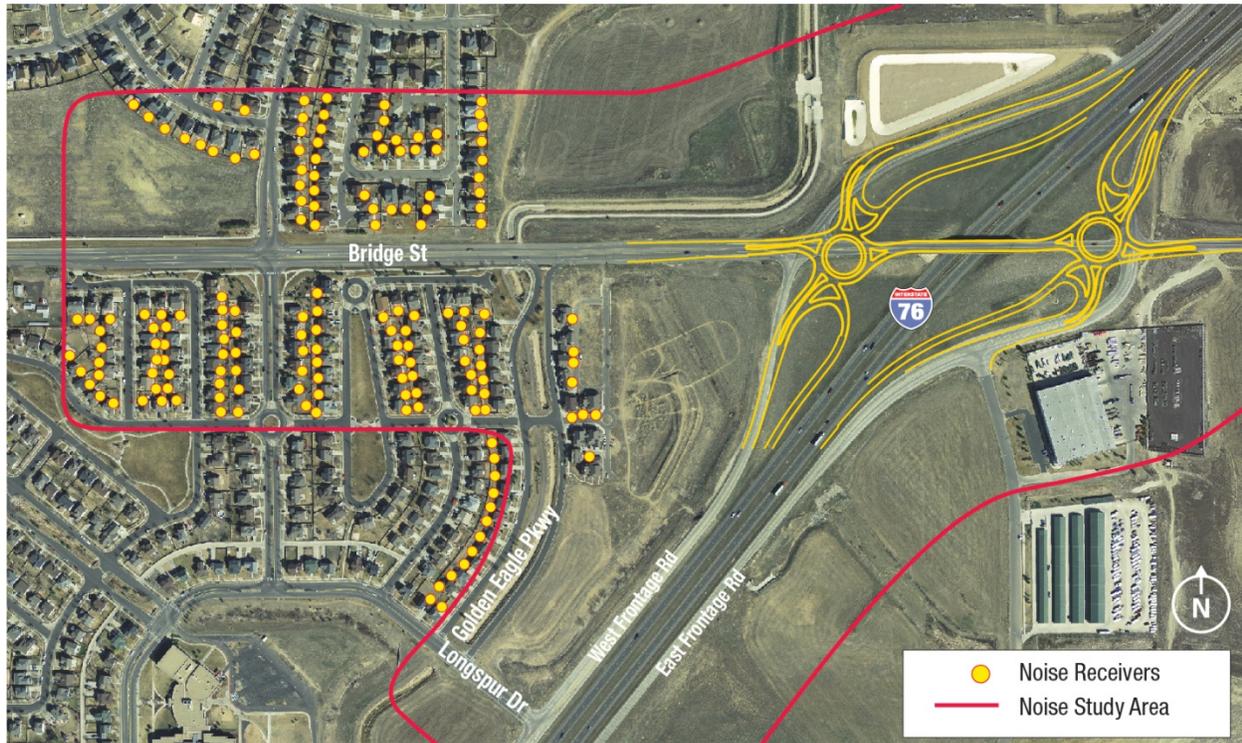
The No-Action Alternative serves as the baseline against which the Action Alternatives were compared. For the purposes of this study, the No-Action Alternative is defined as the existing and planned future facilities within the study area. Under the No-Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

3.2.1 Direct impacts

The only change between the existing conditions and the No-Action Alternative noise models is the amount of traffic. By 2035, the increase in traffic on the existing road network would cause an increase in traffic noise for all dwelling units, but by no more than 4 dBA. Noise levels for the No-Action Alternative range between 47 dBA and 64 dBA. Since no receptors would experience an increase in noise greater than 10 dBA or a noise level greater than the NAC, there are no noise impacts under the No-Action Alternative.

3.3 Preferred Alternative: Two-Roundabout Interchange

The Preferred Alternative for this interchange is the Two-Roundabout Interchange. This alternative combines the frontage roads and ramp terminals to make one six-legged roundabout on either side of I-76. This alternative meets the documented Purpose and Need of the project. It preserves the existing bridge structure of Bridge Street over I-76, can be designed within the existing right of way (ROW), and avoids impacts to the Speer Canal to the northwest of the interchange. This alternative is expected to operate at LOS B in the year 2035. The Two-Roundabout interchange design is shown in Exhibit 3-3 below.

Exhibit 3-3. Preferred Alternative: Two-Roundabout Interchange**3.3.1 Direct impacts**

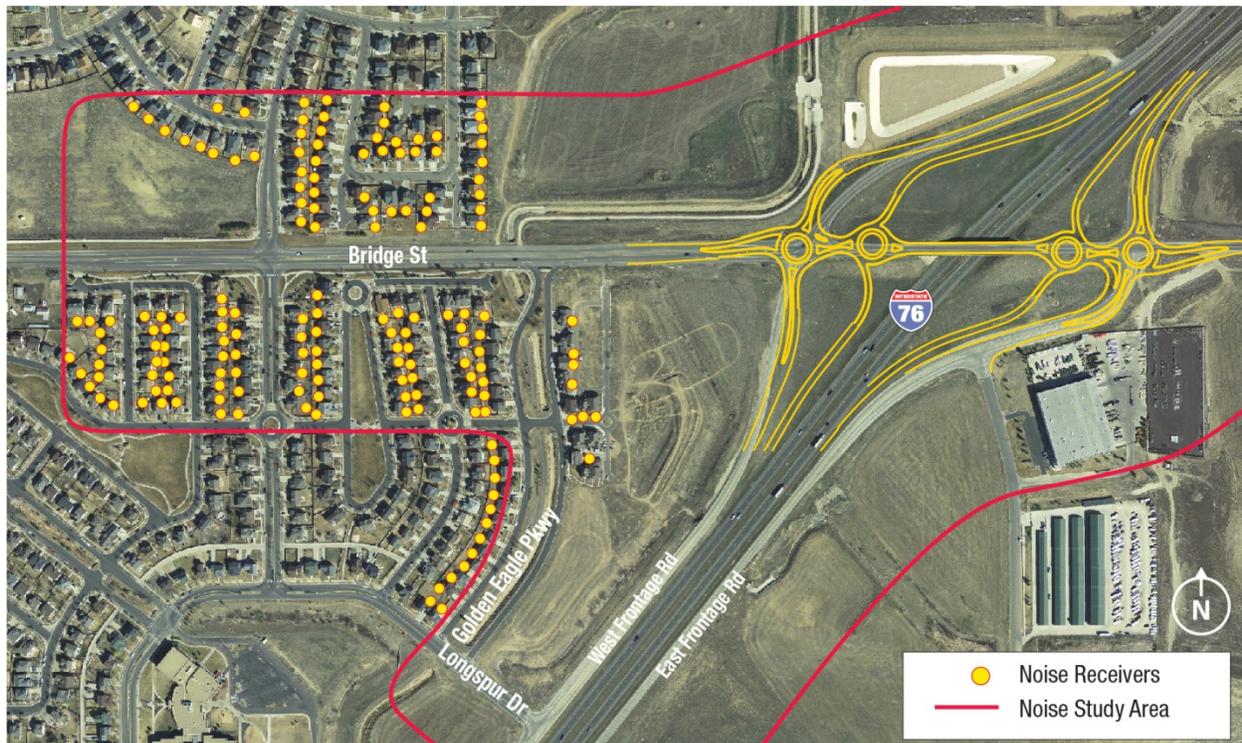
The Preferred Alternative, like all of the Action Alternatives, would draw more traffic to Bridge Street. The increase in volume would create higher noise levels in the neighborhoods surrounding the Bridge Street and Prairie Falcon Parkway intersection, which is reflected in the model results. The frontage road adjacent to I-76 is projected to carry about half the volume in this and all other Action Alternatives as compared to the No-Action Alternative. While the amount of traffic using the freeway facilities would be similar in this and all other Action Alternatives, approximately 100 vehicles in each direction would use the ramps instead of the mainline. These 200 cars would travel at a lower speed when using the ramps, resulting in less noise.

The noise levels in the Preferred Alternative range between 49 dBA and 65 dBA. No receptor experiences more than a 5 dBA increase in noise compared to existing conditions. Since no receptor would experience noise levels above the NAC threshold or a substantial increase in noise, there would be no traffic noise impacts for the Preferred Alternative. Because there are no impacted receptors for this alternative, abatement analysis and mitigation are not required.

3.4 Action Alternative 2: Four-Roundabout Interchange

Action Alternative 2 for this EA is the Four-Roundabout interchange. This alternative creates two four-legged roundabouts on either side of I-76. This alternative meets the documented Purpose and Need of the project. It preserves the existing bridge structure of Bridge Street over I-76 and has minor ROW impacts. The two four-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. This alternative is expected to operate at LOS B in the year 2035. The Four-Roundabout interchange design is shown in Exhibit 3-4 below.

Exhibit 3-4. Four-Roundabout Interchange



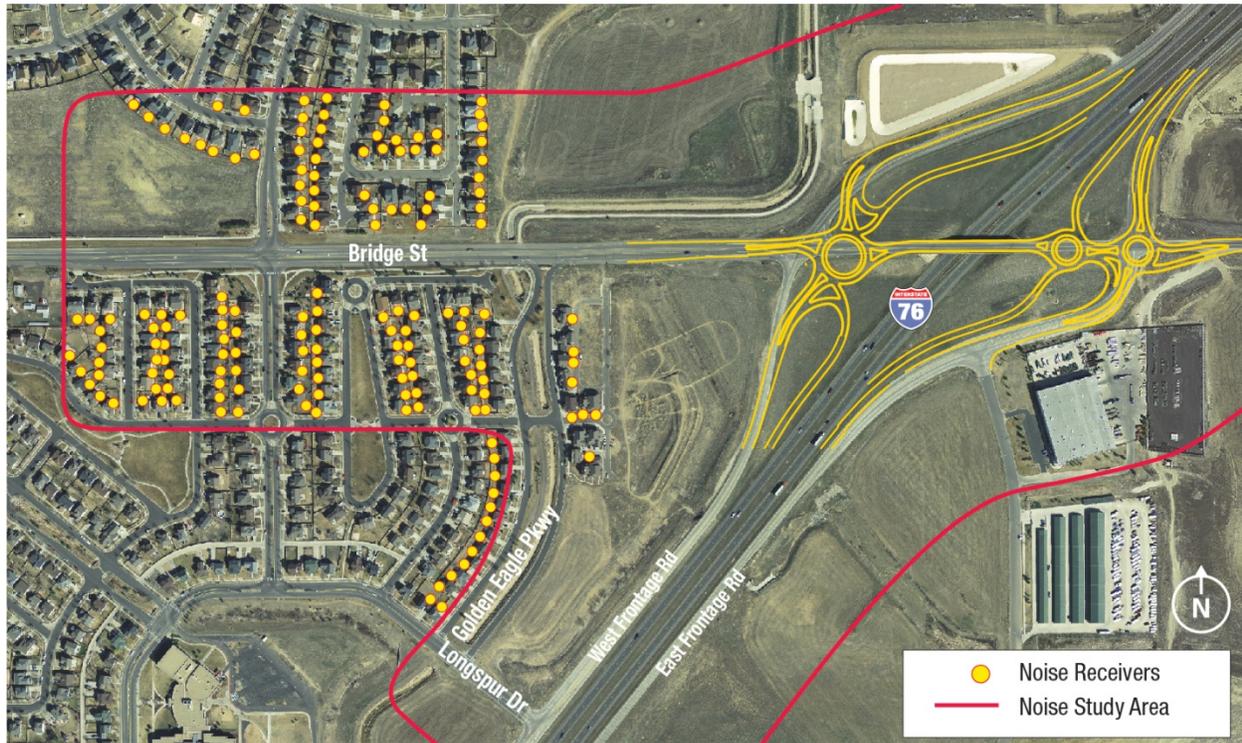
3.4.1 Direct impacts

Like The Preferred Alternative, all of the receptors would experience an increase in traffic noise in Action Alternative 2 compared to the Existing Conditions.

The noise levels in Action Alternative 2 range between 49 dBA and 65 dBA. No receptor experiences more than a 5 dBA increase in noise compared to existing conditions. No receptors exceed the NAC threshold of 66 dBA or experience a substantial increase over existing conditions, so there are no noise impacts for Action Alternative 2. Because there are no impacted receptors, abatement analysis and mitigation are not required.

3.5 Action Alternative 3: Three-Roundabout Interchange

Action Alternative 3 for this EA is the Three-Roundabout interchange. This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76. This alternative meets the documented Purpose and Need of the project. It preserves the existing bridge structure of Bridge Street over I-76 and has minor ROW impacts. The west frontage road and I-76 westbound on- and off-ramps are combined into one six-legged roundabout. The east side connects the eastbound on- and off-ramps to Bridge Street in one four-legged roundabout, and the frontage road to Bridge Street in a second four-legged roundabout. The Three-Roundabout interchange design is shown in Exhibit 3-5 below.

Exhibit 3-5. Three-Roundabout Interchange**3.5.1 Direct impacts**

Similar to the Preferred Alternative and Action Alternative 2, all of the receptors would experience an increase in traffic noise compared to the existing conditions.

The noise levels in Action Alternative 3 range between 49 dBA and 65 dBA. No receptor experiences more than a 5 dBA increase in noise compared to existing conditions. No receptors exceed the NAC threshold or experience a substantial increase over existing conditions. Therefore, there are no noise impacts for Action Alternative 3. Because there are no impacted receptors, abatement analysis and mitigation are not required.

3.6 Results Summary

The results for the Existing, 2035 No-Action Alternative, and 2035 Action Alternatives are summarized in Exhibit 3-6. The detailed results are presented in Exhibit 3-7.

There are no impacts to dwelling units with the implementation of any of the alternatives, so mitigation does not need to be considered for the future action conditions.

Exhibit 3-6. Results Summary

Alternative	Predicted Noise Range Leq(h) (dBA)		Total number of Dwelling Units	Number of Dwelling Units that Exceed NAC Threshold	Number of Dwelling Units with a Substantial Noise Increase
	Min	Max			
Existing	45	62	182	0	N/A
2035 No-Action Alternative	47	64	182	0	0
2035 Preferred Alternative	49	65	182	0	0
2035 Action Alternative 2	49	65	182	0	0
2035 Action Alternative 3	49	65	182	0	0

Exhibit 3-7. Detailed Results Summary

Receptor Number	Dwelling Units	NAC Category	Existing Noise Level	2035 No Action Alternatives	2035 Preferred Alternative	2035 Action Alternative 2	2035 Action Alternative 3
1	1	B	55	57	57	58	57
2	1	B	55	56	57	57	57
3	1	B	55	56	57	57	57
4	1	B	55	57	57	57	57
5	1	B	55	57	57	57	57
6	1	B	55	57	57	57	57
7	1	B	56	58	58	58	58
8	1	B	56	58	58	58	58
9	1	B	56	58	58	58	58
10	1	B	57	59	59	59	59
11	1	B	57	59	59	59	59
12	1	B	57	59	59	59	59
13	1	B	58	60	60	60	60
14	1	B	58	60	60	60	60
15	1	B	58	60	60	60	60
16	1	B	58	60	60	60	60
17	1	B	57	59	60	60	60
18	1	B	58	60	60	60	60
19	1	B	57	59	59	60	59
20	10	B	57	59	59	59	59

Receptor Number	Dwelling Units	NAC Category	Existing Noise Level	2035 No Action Alternatives	2035 Preferred Alternative	2035 Action Alternative 2	2035 Action Alternative 3
21	3	B	56	58	58	58	58
22	1	B	56	58	58	58	58
23	4	B	59	61	60	60	60
24	3	B	56	58	58	58	58
25	2	B	56	58	58	58	58
26	2	B	56	58	58	58	58
27	2	B	57	59	59	60	59
28	1	B	57	58	60	60	60
29	1	B	55	57	58	58	58
30	1	B	55	56	57	57	57
31	1	B	55	56	57	57	57
32	1	B	54	56	57	57	57
33	1	B	54	56	56	56	56
34	1	B	54	56	57	57	57
35	1	B	55	57	57	57	57
36	1	B	55	57	57	57	57
37	1	B	52	54	56	56	56
38	1	B	54	55	57	57	57
39	1	B	53	54	56	56	56
40	1	B	51	53	54	54	54
41	1	B	50	52	53	53	53
42	1	B	50	52	53	53	53
43	1	B	50	52	53	53	53
44	1	B	51	53	54	54	54
45	1	B	53	55	55	55	55
46	1	B	53	55	55	55	55
47	1	B	52	54	54	54	54
48	1	B	51	53	53	53	53
49	1	B	51	52	53	53	53
50	1	B	51	52	54	54	54
51	1	B	51	53	55	55	55
52	1	B	60	61	64	64	64
53	1	B	57	59	61	61	61
54	1	B	52	54	57	57	57

Receptor Number	Dwelling Units	NAC Category	Existing Noise Level	2035 No Action Alternatives	2035 Preferred Alternative	2035 Action Alternative 2	2035 Action Alternative 3
55	1	B	50	51	53	53	53
56	1	B	49	50	52	52	52
57	1	B	48	50	51	51	51
58	1	B	48	50	51	51	51
59	1	B	50	52	52	52	52
60	1	B	50	51	52	52	52
61	1	B	49	51	52	52	52
62	1	B	49	51	52	52	52
63	1	B	50	52	53	53	53
64	1	B	51	53	55	55	55
65	1	B	54	56	58	58	58
66	1	B	59	61	62	62	62
67	1	B	53	55	56	56	56
68	1	B	50	52	54	54	54
69	1	B	49	50	52	52	52
70	1	B	48	50	51	51	51
71	1	B	49	50	51	51	51
72	1	B	48	50	51	51	51
73	1	B	48	50	51	51	51
74	1	B	48	50	51	51	51
75	1	B	48	50	52	52	52
76	1	B	50	52	53	53	53
77	1	B	52	54	55	55	55
78	1	B	55	57	58	58	58
79	1	B	59	61	62	62	62
80	1	B	62	64	65	65	65
81	1	B	54	56	57	57	57
82	1	B	54	56	57	57	57
83	1	B	55	56	57	57	57
84	1	B	52	54	55	55	55
85	1	B	49	51	52	52	52
86	1	B	48	49	51	51	51
87	1	B	46	48	49	49	49
88	1	B	46	48	49	49	49

Receptor Number	Dwelling Units	NAC Category	Existing Noise Level	2035 No Action Alternatives	2035 Preferred Alternative	2035 Action Alternative 2	2035 Action Alternative 3
89	1	B	47	48	49	49	49
90	1	B	47	49	50	50	50
91	1	B	47	49	50	50	50
92	1	B	47	49	50	50	50
93	1	B	47	49	50	50	50
94	1	B	48	50	51	51	51
95	1	B	49	51	52	52	52
96	1	B	52	54	55	55	55
97	1	B	54	55	56	56	56
98	1	B	54	56	57	57	57
99	1	B	56	57	58	58	58
100	1	B	52	54	55	55	55
101	1	B	51	52	53	53	53
102	1	B	49	51	52	52	52
103	1	B	49	50	51	51	51
104	1	B	48	50	50	50	50
105	1	B	48	50	50	50	50
106	1	B	48	50	51	51	51
107	1	B	49	51	52	52	52
108	1	B	51	53	54	54	54
109	1	B	59	60	62	62	62
110	1	B	56	57	59	59	59
111	1	B	54	55	57	57	57
112	1	B	52	54	55	55	55
113	1	B	51	53	54	54	54
114	1	B	51	52	53	53	53
115	1	B	50	52	52	52	52
116	1	B	50	51	52	52	52
117	1	B	49	51	51	51	51
118	1	B	58	60	62	62	62
119	1	B	54	56	58	58	58
120	1	B	52	53	55	55	55
121	1	B	56	57	60	60	60
122	1	B	56	58	60	60	60

Receptor Number	Dwelling Units	NAC Category	Existing Noise Level	2035 No Action Alternatives	2035 Preferred Alternative	2035 Action Alternative 2	2035 Action Alternative 3
123	1	B	52	54	56	56	56
124	1	B	55	57	59	59	59
125	1	B	59	60	63	63	63
126	1	B	47	49	50	50	50
127	1	B	47	49	50	50	50
128	1	B	48	50	50	50	50
129	1	B	47	49	50	50	50
130	1	B	47	49	50	50	50
131	1	B	48	49	50	50	50
132	1	B	47	49	50	50	50
133	1	B	47	49	50	50	50
134	1	B	47	49	49	49	49
135	1	B	47	49	49	49	49
136	1	B	47	49	49	49	49
137	1	B	59	61	63	63	63
138	1	B	54	56	59	59	59
139	1	B	52	54	56	56	56
140	1	B	50	52	54	54	54
141	1	B	49	51	53	53	53
142	1	B	47	50	52	52	52
143	1	B	47	49	51	51	51
144	1	B	46	48	50	50	50
145	1	B	45	47	49	49	49
146	1	B	58	60	62	62	62
147	1	B	54	56	58	58	58
148	1	B	51	54	56	56	56
149	1	B	50	52	54	54	54
150	1	B	49	52	53	53	53
151	1	B	48	50	52	52	52
152	1	B	47	49	51	51	51
153	1	B	46	48	50	50	50
154	1	B	47	50	51	51	51
155	1	B	46	48	50	50	50
156	1	B	54	58	59	59	59

Receptor Number	Dwelling Units	NAC Category	Existing Noise Level	2035 No Action Alternatives	2035 Preferred Alternative	2035 Action Alternative 2	2035 Action Alternative 3
157	1	B	52	55	57	57	57
158	1	B	51	53	55	55	55
159	1	B	51	52	54	54	54
160	1	B	50	52	53	53	53
161	1	B	49	51	52	52	52
162	1	B	48	50	51	51	51
163	1	B	47	49	50	50	50

4. Mitigation

4.1 Construction Noise

Construction noise will present the potential for short-term impacts to those receptors located along the corridor and along designated construction access routes. However, these impacts are difficult to predict. It is anticipated that a portion of the construction will occur at night to minimize traffic disruption. The primary source of construction noise is expected to be diesel-powered equipment, such as trucks and earth-moving equipment, and construction activities such as demolition hammers on trackhoes, rubble load outs, and tailgate and bucket bang.

Construction noise at off-site receptor locations will usually be dependent on the loudest one or two pieces of equipment operating at the moment. Noise levels from diesel powered equipment range from 80 to 95 dBA at a distance of 50 feet. Noise impacts are expected to occur during the day and night, but only in isolated areas along the project corridor.

This project will abide by all appropriate city codes as they pertain to construction noise. If noise levels during construction are expected to exceed the limits from the city code, the contractor must obtain the necessary ordinance variance.

According to the Building Division of the Development Services Office, the unincorporated sections of Adams County do not have a noise ordinance pertaining to construction. At Bridge Street, the City of Brighton limits are approximately one-half mile east of I-76. Unincorporated Adams County lies beyond that limit.

4.1.1 Construction mitigation

This EA document can only present mitigation recommendations, not requirements or final decisions. That step is left to final design. However, the following recommendations for mitigation measures are proposed.

Since there are only temporary noise impacts with construction of the Action Alternatives, no permanent noise mitigation is recommended. However, prior to construction, all relevant permissions will be acquired. Each construction contractor shall submit a work plan outlining work schedules and intended mitigation measures prior to initiating construction.

The following Best Management Practices (BMPs) will be recommended for the contractor as applicable:

- Use noise blankets on equipment and quiet-use generators

- Minimize construction duration in residential areas as much as possible
- Minimize night-time activities in residential areas as much as possible
- Re-route truck traffic away from residential streets where possible
- Combine noisy operations to occur in the same time period

Additional BMPs for consideration include:

- Eliminating slamming of truck beds, truck tailgates, and equipment buckets
- Idling down equipment engines when the equipment is not in immediate use
- Maintaining all equipment to meet manufacturer's specifications
- Scheduling trucks properly to minimize long queues
- Minimizing back-up distances for trucks and other equipment
- Installing localized noise shielding around compressors and other equipment when in close proximity to residences.

Contractors also will consider maintaining contact with the public through a 24-hour telephone line for questions and concerns and providing schedules of planned construction activities.

For more information on construction noise issues, see FHWA's *Highway Construction Noise Handbook* (2006).

4.2 Local Agency Coordination

Local government officials can promote compatibility between land development and highways by ensuring that NAC B,C, and E type development is restricted or limited within the areas that are projected to be impacted by traffic noise. Noise contours will be provided to local officials as a part of this project. These contours can be used to establish compatible development of currently undeveloped parcels or compatible redevelopment in areas where land use changes. NAC E sites should use this information to situate outdoor use areas associated with office buildings and commercial centers away from the roadway.

5. Summary

To determine noise impacts for the project, existing and future 2035 traffic volumes were used. Field measurements were taken in the project area to validate the existing noise model. To validate the existing noise model, results from field measurements need to be within +/- 3 dBA of the output from the model. After the existing noise model was validated, the Action and No-Action Alternatives were modeled with future 2035 traffic volumes; the Action Alternatives included an interchange at Bridge Street with three different roundabout configurations.

TNM modeling results indicate that no highway traffic noise impacts would occur under any of the No-Action or any of the Action alternatives. Therefore, no noise abatement analysis was required and no noise mitigation will be provided for the effects of this project.

6. References

Atkins, 2013. I-76 and Bridge Street: Approval Request for an Interchange at I-76 and Bridge Street, System-Level Study. Atkins North America, Inc., Denver, Colorado. September 2013.

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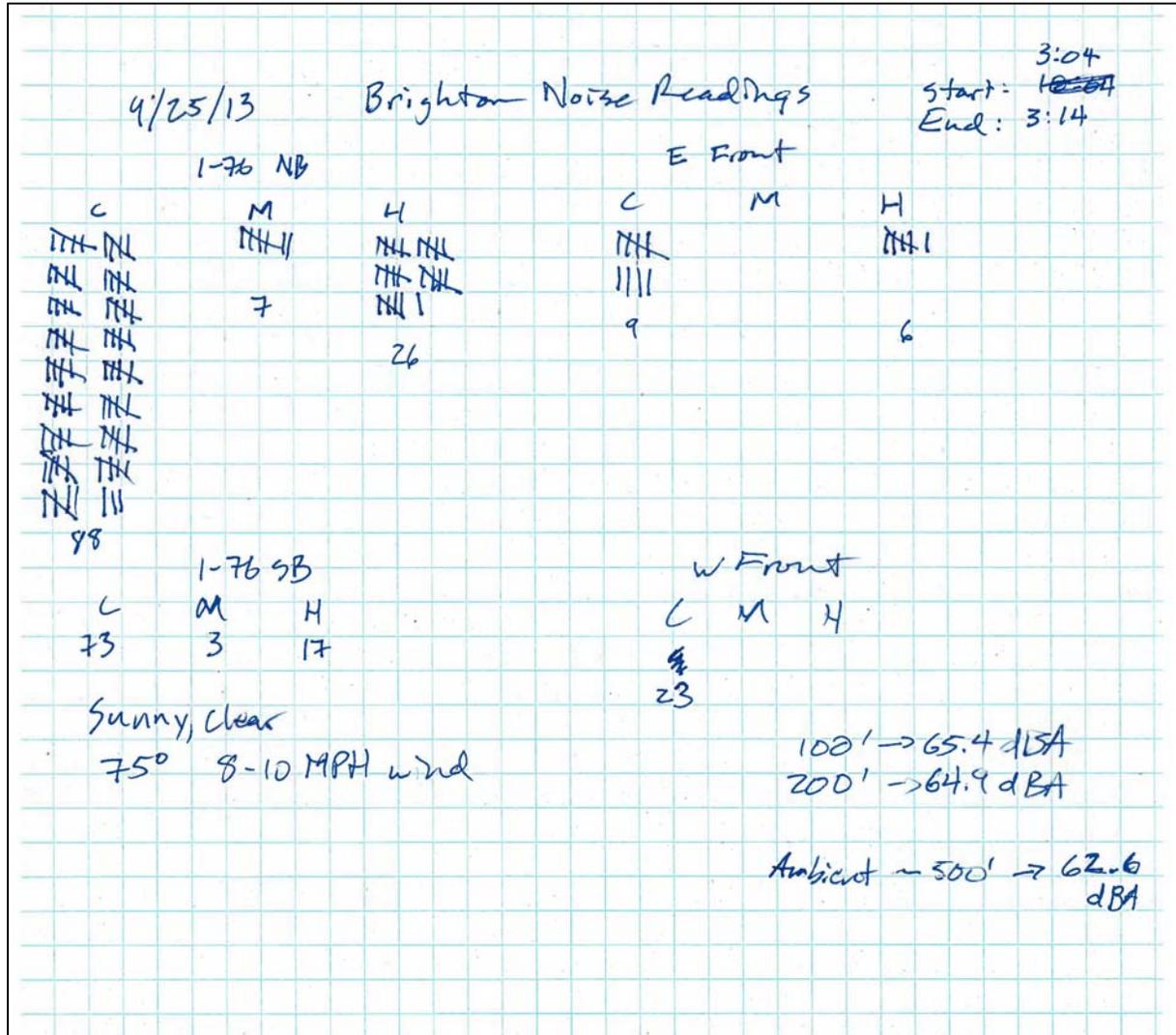
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Appendices

Appendix A: Details of Field Measurements

Appendix A.

Details of Field Measurements





Biological Resources

Technical Report

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List of acronyms and abbreviations

BMP	Best Management Practice
BO	Biological Opinion
Brighton	City of Brighton
CDOA	Colorado Department of Agriculture
CDOT	Colorado Department of Transportation
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
CRS	Colorado Revised Statutes
CSP	Central Shortgrass Prairie
CWA	Clean Water Act
EA	Environmental Assessment
EO	Executive Order
ESA	United States Endangered Species Act
FHWA	Federal Highway Administration
GPS	Global positioning system
LOS	Level of service
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
PBA	Programmatic Biological Assessment
ROW	Right of way
SPWRAP	South Platte Water Related Activities Program
USFWS	U.S. Fish and Wildlife Service

1. Introduction

The I-76 and Bridge Street Interchange Environmental Assessment (EA) is a joint effort between the City of Brighton (Brighton), the Federal Highway Administration (FHWA), and the Colorado Department of Transportation (CDOT). This EA will identify potential impacts of the proposed interchange on the built and natural environment.

1.1 Biological Resources

This technical report has been prepared to address potential project impacts to biological resources, including habitat and vegetation; noxious weeds; federally and state-listed threatened, endangered, proposed, and candidate species; sensitive species; migratory birds; and Senate Bill 40 resources.

Waters of the U.S, including wetlands, are addressed in *the I-76 and Bridge Street Environmental Assessment Wetland Finding Report*. Impacts are anticipated to be covered under a Nationwide Permit 14 (NWP 14) for Linear Transportation projects under Section 404 of the Clean Water Act (CWA).

1.2 Project Location

The proposed project is located at the I-76 and Bridge Street intersection within the City of Brighton, Colorado (see Exhibit 1-1), where Bridge Street passes over I-76 with no direct connection. The approximate geographical location of the project is centered at decimal degree coordinates (North American Datum [NAD] 83) latitude 39.986913°, longitude -104.735925°. The project is located in parts of Sections 2 and 11, Township 1 South, Range 65 West of the 6th Principal Meridian on the United States Geological Survey (USGS) Mile High Lakes, Colorado 7.5-Minute Quadrangle (USGS, 1994). The elevation of the site is approximately 5,060 feet above mean sea level (msl).

Exhibit 1-1 Project Location Map



1.3 Project Alternatives

1.3.1 No-Action Alternative

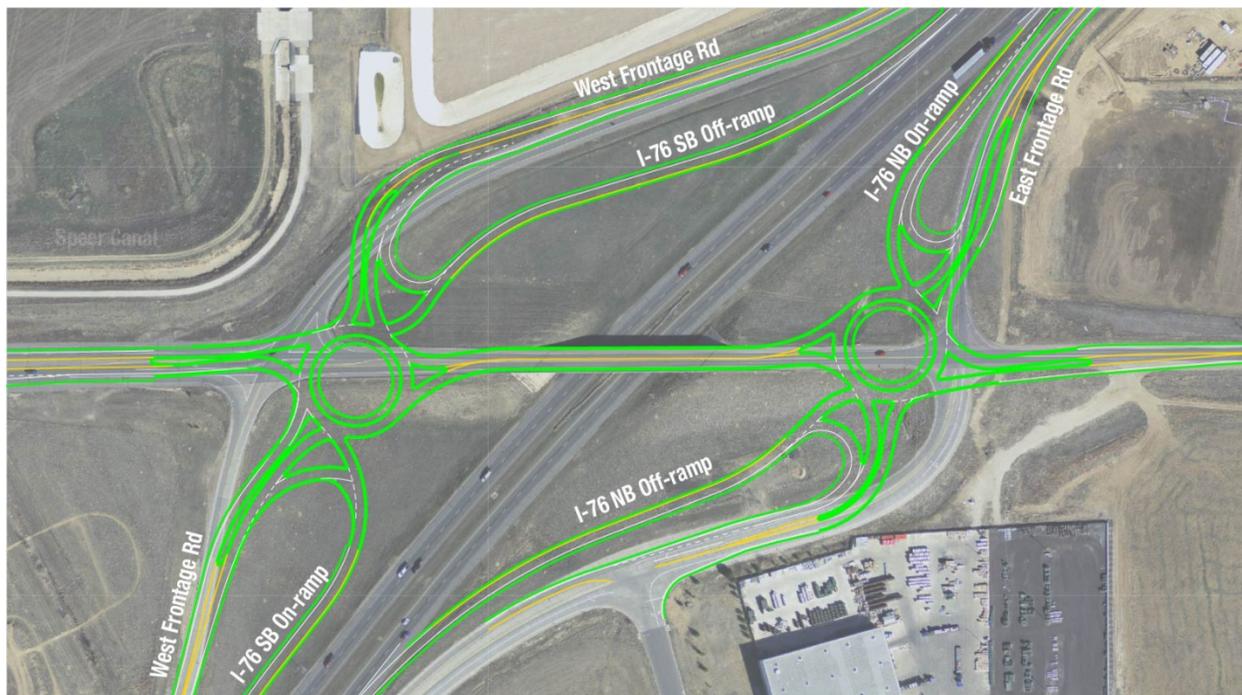
The No-Action Alternative serves as the baseline against which Action Alternatives were compared. For the purposes of this study, the No-Action Alternative is defined as the existing facilities within the project area. Under the No-Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

1.3.2 Preferred Alternative: Two-Roundabout Interchange Design

The Preferred Alternative for the EA is the Two-Roundabout Interchange. This alternative combines the frontage roads and ramp terminals to make one six-legged roundabout on both the east side and west side of I-76 (see Exhibit 1-2). This alternative meets the project Purpose and Need. The Preferred Alternative would preserve the existing bridge, can be designed within the existing right of way (ROW), and avoids impacts to the Speer Canal to the northwest of the interchange. This alternative would be expected to operate at level of service (LOS) B in the year 2035.

Each roundabout would have an outside diameter of 200 feet, including a 12-foot truck apron for truck traffic. To develop approach angles as a traffic-calming technique and to lessen ROW impacts, both roundabouts would be placed off center of the existing Bridge Street center line. Splitter islands would be included to slow traffic coming into the roundabouts. The roundabouts would be designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. This alternative would have the least amount of access points among the Action Alternatives.

Exhibit 1-2 Preferred Alternative: Two-Roundabout Interchange



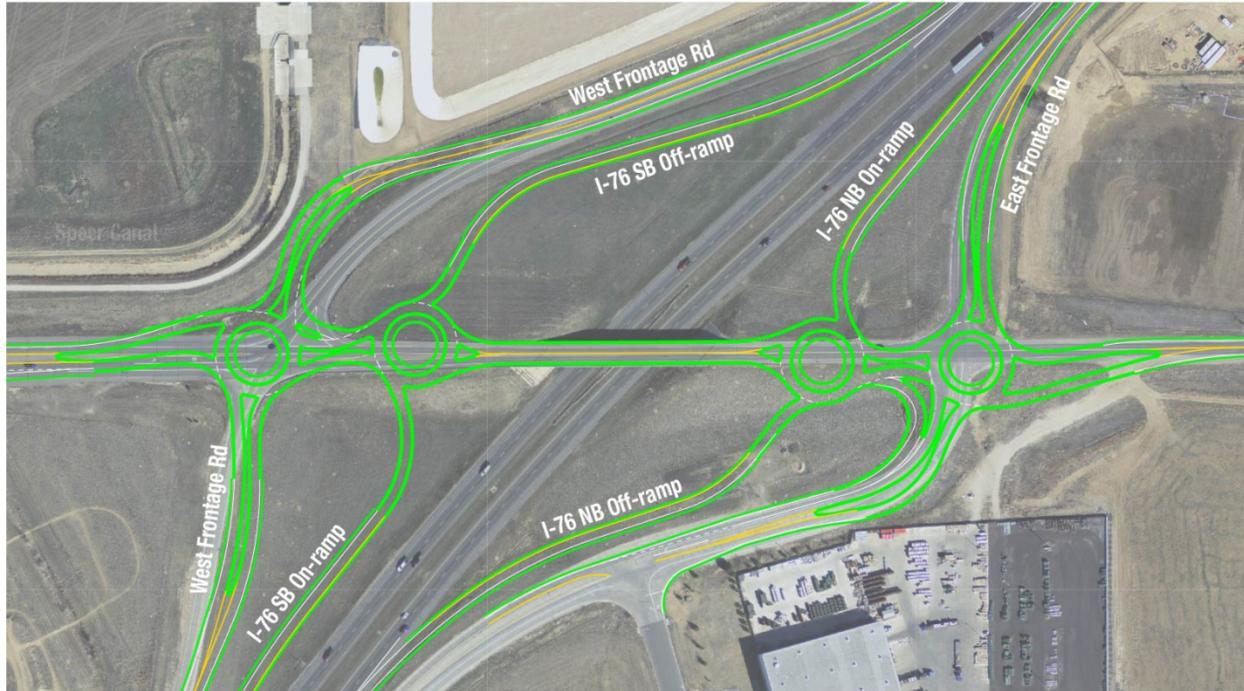
1.3.3 Alternative 2: Four-Roundabout Interchange Design

Alternative 2 for this EA is the Four-Roundabout Interchange. Exhibit 1-3 shows that this alternative would create two four-legged roundabouts on each side (east and west) of I-76. This alternative meets the project Purpose and Need. Alternative 2 preserves the existing bridge and has only minor ROW impacts. This alternative would be expected to operate at LOS B in the year 2035.

The two four-legged roundabouts on the east and west side of I-76 would allow truck traffic to be separated from residential traffic. Each roundabout would have an outside diameter of 110 feet, including a 12-foot

truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts would be placed off center of the existing Bridge Street center line slightly to develop approach angles as a traffic-calming technique and to lessen ROW impacts. Splitter islands would be included to slow traffic coming into the roundabouts. The roundabouts would be designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

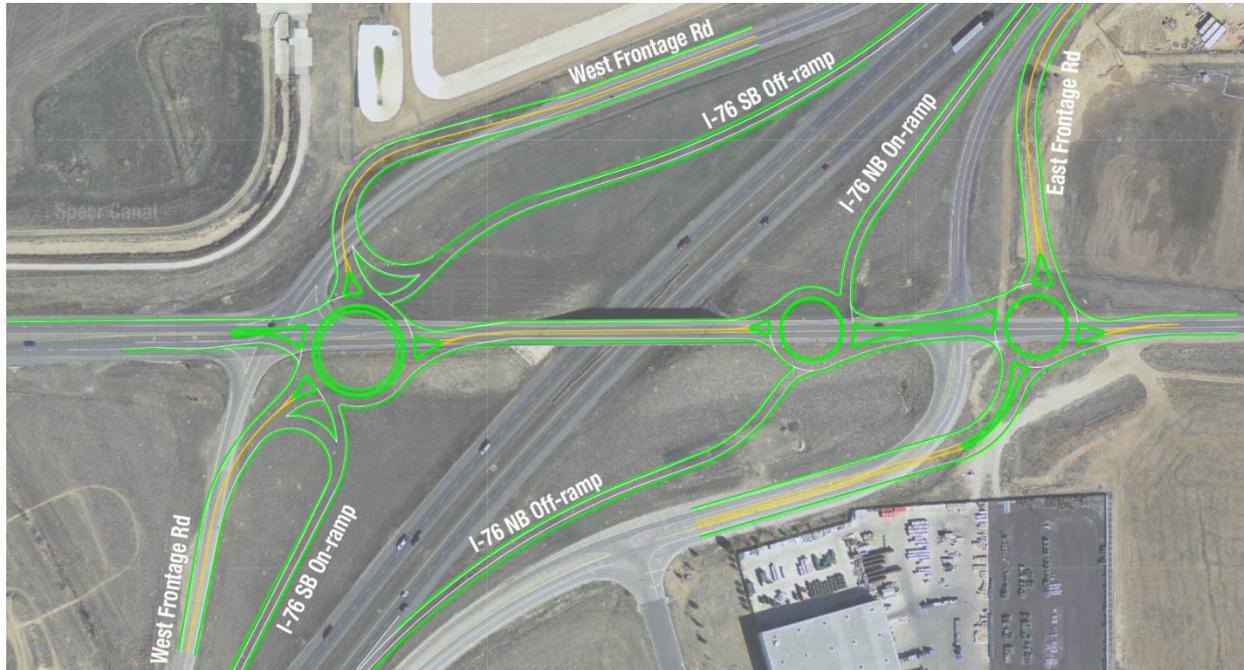
Exhibit 1-3 Alternative 2: Four-Roundabout Interchange



1.3.4 Alternative 3: Three-Roundabout Interchange Design

This alternative would consist of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76 (see Exhibit 1-4). The West Frontage Road and I-76 westbound ramps would be combined into one six-legged roundabout with an outside diameter of 200 feet, including a 12-foot truck apron. The east side would combine the eastbound ramp terminal into one four-legged roundabout and the frontage roads into another four-legged roundabout. Each of the smaller roundabouts would have an outside diameter of 150 feet, including a 12-foot truck apron. This alternative would meet the project Purpose and Need. Alternative 3 would preserve the existing bridge and would have minor ROW impacts, primarily to the east. The two four-legged roundabouts on the east side of I-76 would allow truck traffic to be separated from residential traffic. This alternative would be expected to operate at LOS B in the year 2035.

For the pairing on the east side and the single roundabout on the west side, the roundabouts would be placed off center of the existing Bridge Street center line to develop approach angles as a traffic calming technique. Splitter islands would be included to slow traffic coming into the roundabouts. The roundabouts would be designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

Exhibit 1-4 Alternative 3: Three-Roundabout Interchange**1.4 Regulatory Environment**

This technical report has been prepared in accordance with the following federal and state regulations:

- **The United States Endangered Species Act (ESA)**—Protects federally listed plant and animal species with the goal of ensuring their long-term survival. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS).
- **The Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act**—Vegetation clearing, earth-moving, bridge demolition, and other construction activities have the potential to disrupt nesting activity or destroy nests of bird species protected under the MBTA. The USFWS and Colorado Parks and Wildlife (CPW) administer these requirements.
- **The Colorado Nongame, Endangered, and Threatened Species Conservation Act**—Provides some protection within the state for listed species and establishes the state's intent to protect endangered, threatened, or rare species. The CPW is responsible for listing species.
- **Colorado Senate Bill 40 (SB 40)**—Colorado SB 40 (33-5-101-107, Colorado Revised Statutes [CRS] 1973, as amended) requires any agency of the state to obtain wildlife certification from the CPW when construction is planned in "... any stream or its bank or tributaries" Although SB 40 emphasizes the protection of fishing waters, it acknowledges the need to protect and preserve all fish and wildlife resources associated with streams in Colorado. CDOT and the CPW have a Memorandum of Agreement (MOA) with the Colorado Department of Natural Resources (CDOW and CDOT, 2013) to clarify when SB 40 certification is required and to describe the procedures to be followed by CDOT in securing this certification. Information regarding potential SB 40 resources located in the project area is presented in this report. Detailed information regarding methodology, results, impacts, and mitigation are presented under separate cover, if needed.
- **Prairie Dog Protection**—Is based on municipal and state agency policies; the most stringent policy for a given area must be followed. In CDOT ROW, the applicable policies are the CDOT Impacted Black-Tailed Prairie Dog Policy (CDOT, 2009) and the Black-Tailed Prairie Dog Relocation Guidelines (CDOT, 2002).
- **Noxious Weeds**—In addition to regulations primarily designed to protect fish and wildlife species, state and federal regulations are in place to protect habitat from plant species determined to be "noxious." The Colorado Department of Agriculture (CDOA) Noxious Weed Act of 2003 (CRS 35-5-101; CRS 35-5.5-101; Executive Order (EO) D-06-99) defines and prioritizes management objectives for state-designated noxious weeds.

2. Affected Environment

2.1 Data Collection Methodology

Project biologists visited the site on September 12, 2013, to assess the project area for biological resources. The weather during the site visit was overcast and raining, and the temperature was approximately 60° Fahrenheit. The following activities were completed during the site visit to assess general habitat and vegetation:

- Mr. DeMasters visually and physically surveyed the project area by walking accessible areas. During the site visit, a Trimble GeoXH6000 global positioning system (GPS) unit was utilized to record relevant information (see Exhibit 2-1).
- Noxious weeds were noted, dominant plant species were recorded, and representative photographs of the project area were taken. A photographic log is provided in Appendix A.
- The project area was evaluated for protected species and their habitat, including:
 - Federally listed threatened, endangered, candidate, and proposed species, as specified by the USFWS Information, Planning, and Conservation (IPaC) System (USFWS, 2014) (Appendix B);
 - State-listed endangered, threatened, and sensitive species, as specified by county on the CPW and Colorado Natural Heritage Program (CNHP) websites; and
 - Migratory bird habitat, specifically, areas within one-half mile of the project area were surveyed for existing raptor nests.

2.2 Current Environmental Conditions

2.2.1 Habitat and Vegetation

Historically a largely agricultural community, land in the immediate vicinity of the I-76 and Bridge Street intersection is primarily undeveloped (see Exhibit 2-1). West of I-76, there is residential development, and there is additional planned residential and commercial growth on both the east and west sides of the interstate. Future planned land uses include further industrial, employment, mixed-use, high-density residential, and agricultural development. A new high-density neighborhood is being developed on the northwest corner of Bridge Street and I-76.

Colorado's Eastern Plains, a portion of the Central Shortgrass Prairie (CSP) ecoregion, covers one-third of the state of Colorado, from approximately I-25 to the Kansas border (Bailey, 1995). The I-76 and Bridge Street project area is within this ecoregion. Climate has been the primary driver within the CSP; however, urban expansion and frequent disturbances now dictate the vegetation and landscape.

The proposed project would be generally located within existing roadway ROW. Given the presence of the roadway and bridge, it is likely that the natural vegetation, soils, and hydrology have been altered by filling, grading, and improvement activities in the past.

Habitat types within the project area included upland native or planted grasses intermixed with sporadic weedy roadside habitat, wetland habitat in two specific locations, and landscaped areas. Dominant species along much of the upland habitats included: smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), sand dropseed (*Sporobolus cryptandrus*), bulbous bluegrass (*Poa bulbosa*), witchgrass (*Panicum capillare*), sideoats grama (*Bouteloua curtipendula*), needle and thread grass (*Hesperostipa comata ssp. comata*), little bluestem (*Schizachyrium scoparium*), prairie sandreed (*Calamovilfa longifolia*) and sand bluestem (*Andropogon hallii*). Common herbaceous species were kochia (*Bassia scoparia*), curly dock (*Rumex crispus*), and alfalfa (*Medicago sativa*). Scattered shrubs and trees in these areas included rabbitbrush (*Chrysothamnus nauseous*), Siberian elms (*Ulmus pumila*), and plains cottonwoods (*Populus deltoides*).

Dominant species in the wetland areas included narrowleaf cattail (*Typha angustifolia*), marsh muhly (*Muhlenbergia racemosa*), curly dock, and giant ragweed (*Ambrosia trifida*).

Exhibit 2-1 Biological Resources Map



Noxious Weeds

There are weeds in the project area, but they are relatively few in number and not covering large areas. Weeds present within the project area are typical of Colorado Front Range. The State of Colorado places noxious weeds into one of three categories:

- **List A**—species are designated for eradication, and require prevention of seed production or development of reproductive propagules
- **List B**—species are managed and controlled by a noxious weed management plan, with the goal of stopping the continued spread of these species
- **List C**—species for which a project would develop management plans with the goal of supporting jurisdictions that choose to require management of those species (CDOA, 2013).

Four species of weeds on the CDOA Noxious Weed List were observed scattered throughout the project area (CDOA, 2013). See Exhibit 2-2, which presents the common name, scientific name, and state weed list status for these species.

Exhibit 2-2 Noxious Weeds Identified in the Project Area

Common Name	Scientific Name	State Weed List	U.S. Department of Agriculture Code (USDA, 2013)	Density in Project Area
Scotch thistle	<i>Onopordum acanthium</i>	B	ONAC	Low
Puncturevine	<i>Tribulus terrestris</i>	C	TRTE	Medium
Cheatgrass	<i>Bromus tectorum</i>	C	BRTE	Medium
Field bindweed	<i>Convolvulus arvensis</i>	C	COAR4	High

Source: Pinyon, 2013

Threatened, Endangered, and Sensitive Species

Federally Listed Species

Per the USFWS online IPaC System, there are nine federally listed species with the potential to occur in projects in Adams County (USFWS, 2014) (Appendix B) (see Exhibit 2-3).

Exhibit 2-3 Federally Listed Threatened and Endangered Species and Their Potential to Occur in the Project Area

Common Name	Species	Federal Status	Habitat	Potential for Occurrence in Project area
Birds				
Least Tern	<i>Sternula antillarum</i>	FE	Nests in summer along reservoirs, lakes and rivers with bare sandy shorelines or islands.	Low. See discussion below.
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	FT	Mature, old-growth forests that possess complex structural components; canyons, riparian, and conifer communities.	None. Potential habitat was not observed in the project area.

Common Name	Species	Federal Status	Habitat	Potential for Occurrence in Project area
Piping Plover	<i>Charadrius melodus</i>	FT	Wetlands, lakeshores, and marshes. Nesting habitat is along reservoirs, lakes, and rivers with bare sandy/pebbly areas with sparse vegetation.	Low. See discussion below.
Whooping Crane	<i>Grus americana</i>	FE	Utilizes wetlands, irrigated meadows, and reservoir edges as stopovers during migration.	Low. Could occur during migration, although unlikely. See discussion below.
Fish				
Pallid sturgeon	<i>Scaphirhynchus albus</i>	FE	Known population in Mississippi River from Missouri to the Gulf of Mexico.	Low. See discussion below.
Mammals				
Preble's meadow jumping mouse	<i>Zapus hudsonicus preblei</i>	FT	Occurs along Front Range of Colorado along permanent or intermittent streams in areas with herbaceous cover and adequate cover of shrubs and trees.	None. Suitable habitat does not occur in the project area.
Plants				
Colorado butterfly plant	<i>Gaura neomexicana</i> var. <i>coloradensis</i>	FT	Stream channel sites that are periodically disturbed, sub-irrigated alluvial soils along streams; open meadows on floodplains, including riparian areas.	None. Suitable habitat does not occur in the project area.
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>	FT	Sub-irrigated alluvial soils along streams; open meadows on floodplains, including riparian areas.	None. Suitable habitat does not occur in the project area.
Western prairie fringed orchid	<i>Platanthera praeclara</i>	FT	Mesic to wet unplowed tall-grass prairies and meadows.	Low. See discussion below.

Source: USFWS, 2014

Notes:

FT = federally listed as threatened

FE = federally listed as endangered

Five species are listed in Exhibit 2-3 because they occur downstream of the project area along the Platte River and could be impacted by projects that would result in water depletions to the South Platte River, a tributary of the Platte River. These include the interior Least Tern, pallid sturgeon, Piping Plover, Whooping Crane, and Western prairie fringed orchid. This project has elements, such as bridge demolition and reconstruction, which could cause a depletion to the South Platte River basin. To address the effects this depletion will have on federally listed species downstream that depend on the river for their survival, CDOT, as a state agency, is participating in the South Platte Water Related Activities Program (SPWRAP). CDOT is cooperating with FHWA, which provides a federal nexus for the project. In response to the need for formal consultation for the water used from the South Platte River basin, FHWA has prepared a Programmatic Biological Assessment (PBA) that will estimate total water usage from 2012 until 2019. The PBA addresses the five species noted above. The water used for this project will be reported to the USFWS at the year's end after the completion of the project in compliance with the aforementioned consultation. Effects to species not addressed in the PBA or affected by causes other than water depletions to the South Platte are analyzed separately in this Biological Resources Report (BRR).

State-Listed Species

The CPW lists 74 species of amphibians, birds, fish, mammals, reptiles, and mollusks as endangered, threatened, or of special concern within the state of Colorado (CPW, 2013). The majority of these species are not expected to occur in the project area because the project area is outside of their range and/or appropriate habitat is not present. According to the CNHP Tracking List and habitat requirements, eight state-listed sensitive species were identified with the potential to occur within the project area (CNHP, 2012) (Exhibit 8).

Exhibit 2-4 State-Listed Threatened and Endangered Species and Their Potential to Occur in the Project Area

Common Name	Species	State Status	Habitat	Potential for Occurrence in Project area
Amphibians				
Northern leopard frog	<i>Lithobates pipiens</i>	SC	Typical habitats include wet meadows and the banks and shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	Low. Suitable habitat exists along the Speer Canal and West Burlington Extension Ditch within the project area.
Birds				
Bald Eagle	<i>Haliaeetus leucocephalus</i>	ST	Habitat includes reservoirs and rivers. In winter, they may also occur locally in semi-deserts and grasslands, especially near prairie dog towns.	Low. Could occur during migration or winter roosting, although unlikely due to the lack of large trees in the project area.
Ferruginous Hawk	<i>Buteo regalis</i>	SC	Preferred habitat is arid and semiarid grassland, foothills or mid-elevation plateaus with few trees. Avoids cultivated fields and developed areas.	None. Suitable habitat does not occur in the project area.

Common Name	Species	State Status	Habitat	Potential for Occurrence in Project area
Mountain Plover	<i>Charadrius montanus</i>	SC	Habitat includes prairie grasslands, arid plains, and fields. Nesting occurs on grazed shortgrass prairies, overgrazed tallgrass prairies, and fallow fields.	None. Suitable habitat does not occur in the project area.
Mammals				
Black-footed ferret	<i>Mustela nigripes</i>	SE	Occurs in grasslands or shrublands in association with prairie dog colonies.	None. Population has been extirpated in Colorado, with the exception of managed experimental populations.
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	SC	Habitat consists of intermixed shrublands, sagebrush habitat, and/or shortgrass and mixed-grass prairies. Occurs in central and south-central Colorado.	None. None observed in the project area.
Preble's meadow jumping mouse ¹	<i>Zapus hudsonius preblei</i>	ST	Occurs along Front Range of Colorado along permanent or intermittent streams in areas with herbaceous cover and adequate cover of shrubs and trees.	None. Suitable habitat does not occur in the project area.
Reptiles				
Common garter snake	<i>Thamnophis sirtalis</i>	SC	Inhabits marshes, ponds, and the edges of streams and for the most part restricted to aquatic, wetland, and riparian habitats along the floodplains of streams.	Low. Very little habitat exists along the Speer Canal and West Burlington Extension Ditch within the project area.

Sources: CNHP, 2012; USFWS, 2014

Notes:

ST = state listed as threatened

SE = state listed as endangered

SC = state listed as a Species of Concern

Migratory Birds

In addition to the state-listed raptors discussed above, the project could impact other migratory bird species. There are few large trees within the project area suitable for nesting. However, grassy upland areas and small trees in the project area could be used as nest sites. Additionally, there are a few large trees to the west in the southern portion of the project area and to the east outside of the project area that could be used by nesting raptors. These habitats are within the nesting raptor buffer area for many species (CPW, 2008). Cliff Swallow (*Petrochelidon pyrrhonota*) nests were observed in the concrete box culvert of the West Burlington Extension Ditch that passes under I-76 during the site visit (see Exhibit 2-1).

Senate Bill 40

Streams that meet one or more of the following criteria fall under the jurisdiction of SB 40:

1. All perennial streams represented by solid blue lines on United States Geological Service (USGS) 7.5' Quadrangle maps or the National Hydrography Dataset;
2. Segments of ephemeral and intermittent streams providing live water beneficial to fish and wildlife;
3. Segments of streams at which 25 percent or more of the vegetation is comprised of riparian vegetation such as cottonwood, willow, alder, sedges, or other plants dependent on groundwater or overbank flooding. Such segments will be within 300 feet upstream or downstream of the project. The 300-foot distance will be measured along the length of the stream by valley length;
4. Segments of streams having wetlands present within 600 feet upstream and downstream of the project. The 600-foot distance will be measured by valley length; and
5. Drainage ditches do NOT fall under the jurisdiction of SB 40.

Although the West Burlington Extension Ditch passes through the project area and is represented as a solid blue line on the USGS 7.5' Quadrangle map, it has been altered by past construction activities and is not a perennial stream. Moreover, the West Burlington Extension Ditch is a ditch and does not qualify as stated in criterion 5 above. Therefore, there are no SB 40 resources within project area.

3. Impact Analysis

3.1 Impacts Assessment Methodology

Biological resources were overlaid onto alternative footprints to identify areas of potential direct and indirect impacts.

3.2 No-Action Alternative

3.2.1 Direct Impacts

There would be no direct impacts to biological resources as a result of the No-Action Alternative.

3.2.2 Indirect Impacts

There would be no indirect impacts to biological resources as a result of the No-Action Alternative.

3.3 Action Alternatives

There are three Action Alternatives (Preferred Alternative, Alternative 2, and Alternative 3), as described in the Project Alternatives section above. All Action Alternatives would have similar impacts to biological resources. Impacts for all Action Alternatives are discussed below. Where impacts may differ between alternatives, they are called out in the discussion.

3.3.1 Direct Impacts

Habitat and Vegetation

There would be minimal direct impacts to habitat and vegetation in the project area; the Preferred Alternative would impact 0.2 acres; Alternative 2 would impact 0.5 acres, and Alternative 3 would impact 0.1 acres of land. The majority of construction-related activities would occur within existing ROW and already or previously disturbed areas; therefore, impacts to natural vegetation and habitat would be minimal.

Noxious Weeds

There would be minimal direct impacts to noxious weeds from the implementation of the Action Alternatives; the Preferred Alternative would impact 0.2 acres; Alternative 2 would impact 0.5 acres, and Alternative 3 would impact 0.1 acres of land. There are weeds in the project area, but they are relatively few in number and not covering large areas. Project-related construction could introduce new noxious weeds into the project area or increase the abundance of existing noxious weeds. Construction activities include mobilization of construction vehicles, excavation and transport of borrow material and topsoil, land clearing,

and reclamation. Removal of existing vegetation and disturbance of soils could encourage germination and spread of weed seeds and roots. Airborne seeds from noxious weeds present in areas adjacent to the project could germinate in areas where vegetation has been removed.

Threatened, Endangered, and Sensitive Species

The project would likely have no effect on four of the nine federally listed threatened and endangered species: the Colorado butterfly plant, Ute ladies'-tresses orchid, Preble's meadow jumping mouse, and the Mexican Spotted Owl. The project is located in an area that lacks critical habitat for these species.

In addition, five species are listed because they could occur downstream of the project area along the Platte River and could be impacted by projects that would result in water depletions to tributaries of the Platte River, such as the South Platte River. These include the Least Tern, pallid sturgeon, Piping Plover, Whooping Crane, and Western prairie fringed orchid. Projects in the South Platte River watershed could cause water depletion in the Platte River, as water could be used for dust suppression and soil moisture treatments, and could therefore have an adverse effect on the five downstream species. As discussed above, CDOT and FHWA are participating in the SPWRAP and have submitted a PBA to the USFWS. A Biological Opinion (BO: ES/CO: ES/LK-6-CO-12-F-020) was issued and mitigation for potential impacts to downstream species are outlined in the PBA and BO. Therefore, any depletion and adverse effect to the five downstream species would be mitigated through CDOT's participation in the SPWRAP.

In addition to the federally listed species, the project would likely have no effect on state-listed threatened and endangered species as minimal habitat exists in the project area for the eight state-listed species.

Migratory Birds

There would be minimal impacts to vegetation habitat in the project area; the Preferred Alternative would impact 0.2 acres; Alternative 2 would impact 0.5 acres, and Alternative 3 would impact 0.1 acres of land. This, along with construction activities, could negatively affect migratory birds nesting activities.

No raptor nests were observed in or around the project area. However, suitable habitat does occur in the project area, primarily within large trees less than a half-mile southwest and east of the project area. There would be potential for raptors to nest in these areas prior to construction. Therefore, there would be low potential to impact raptors within the CPW buffers for nesting raptors.

Cliff Swallow nests were observed in the existing box culvert structure of the West Burlington Extension Ditch under I-76. Therefore, work around the culvert would have the potential to impact nesting swallows.

Senate Bill 40

There would be no direct impacts to SB 40 resources.

Indirect Impacts

Indirect impacts from construction of any of the Action Alternatives could include the spread of noxious weeds from within the project area to other areas not currently invaded.

4. Mitigation

The following table outlines the mitigation strategies that will be used to limit impacts to biological resources during construction.

CDOT and FHWA are participating in the SPWRAP and have submitted a PBA to the USFWS. A BO (ES/CO: ES/LK-6-CO-12-F-020) was issued. Mitigation measures for potential impacts to downstream species are outlined in the Programmatic Biological Assessment and Biological Opinion. Therefore, any depletion and associated adverse effect to the five downstream species would be mitigated through CDOT's participation in the SPWRAP.

The mitigation strategies that will be used to limit impacts to biological resources during construction are discussed in the sections below.

4.1 Noxious Weeds

There are weeds in the project area, but these are relatively few in number and not covering large areas. Therefore, a noxious weed management plan is not recommended. However, during construction, the project is required to minimize the spread of noxious weeds according to the revised Sections 207, 212, and 217 of the CDOT Standard Specifications, and for implementing the standard CDOT best management practices (BMPs) designed to prevent the spread of noxious weeds, which are:

- Minimize soil disturbance to the greatest extent possible
- Do not stage equipment in weed-infested areas
- Coordinate weed management efforts with local jurisdictional agencies and adjacent landowners to the greatest extent possible
- Use herbicide immediately adjacent to wetlands and/or water bodies only if the label indicates that the use is appropriate for such areas
- Reseed all disturbed soil with a certified weed-free seed mix within seven days of completion of work during the growing season
- Do not use as topsoil during re-vegetation "A" horizon soil material currently supporting noxious weed cover of more than 10 percent
- Do not import topsoil due to the potential for spread of noxious weed
- Monitor and re-treat all areas treated for noxious weeds during construction, if necessary, to prevent re-establishment of noxious weeds
- Any compost used will be Seal of Testing Assurance certified weed-free

4.2 Federally Listed Threatened and Endangered Species

Mitigation for five federally listed downstream species will follow the PBA/BO mitigation from the SPWRAP.

4.3 Migratory Birds

Impacts to birds protected under the MBTA will follow CDOT Specification 240: Protection of Migratory Birds. This generally includes the following mandates.

Tree and Shrub Removal or Trimming:

- Tree and shrub removal or trimming will occur before April 1 or after August 31 if possible. If tree and shrub removal or trimming will occur between April 1 and August 31, a survey for active nests will be conducted by a biologist within the seven days immediately prior to the beginning of work in each area or phase of tree and shrub removal or trimming. The Contractor will notify the Engineer at least ten working days in advance of the need for a biologist to perform the survey.
- If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest will remain undisturbed and protected until the nest becomes inactive. The nest will be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate by a biologist and approved by the Engineer. Work will not proceed within the fenced buffer area until the young have fledged or the nests have become inactive.
- If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time.

5. References

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Appendices

Appendix A: Photographic Log

Appendix B: USFWS IPaC List

Appendix C: CDOW Raptor Guidelines

Photo 1.
Representative
habitat. Standing
near Bridge
Street, west of
I-76. Facing
west.



Photo 2. Large
Russian olive
on the edge of
the ROW, in the
northeast
quadrant, off of
the eastbound
frontage road.



Photo 3.
Ant hill, which
look like prairie
dog burrows on
an aerial.



Photo 4.
Representative
habitat, standing
in southeast
quadrant, facing
north-northeast.



Photo 5.
Treated scotch
thistle.



Photo 6.
Newly emergent
scotch thistle.





U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

Colorado Ecological Services Field Office
DENVER FEDERAL CENTER
P.O. BOX 25486
DENVER, CO 80225
(303) 236-4773
<http://www.fws.gov/coloradoES>
<http://www.fws.gov/platteriver>

Project Name:

I-76 and Bridge IPac Countywide

Project Counties:

Adams, CO

Project Type:

Transportation

Endangered Species Act Species List ([USFWS Endangered Species Program](#))

There are a total of 9 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Note that 5 of these species should be considered only under certain conditions. See the second table below for a list of these species and the conditions under which effects should be considered. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:



Natural Resources of Concern

Birds	Status		Has Critical Habitat	Contact
Mexican Spotted owl (<i>Strix occidentalis lucida</i>) Population: Entire	Threatened	species info	Final designated critical habitat	Colorado Ecological Services Field Office
Flowering Plants				
Colorado Butterfly plant (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	Threatened	species info	Final designated critical habitat	Colorado Ecological Services Field Office
Ute ladies'-tresses (<i>Spiranthes diluvialis</i>)	Threatened	species info		Colorado Ecological Services Field Office
Mammals				
Preble's meadow jumping mouse (<i>Zapus hudsonius preblei</i>) Population: U.S.A. (CO, WY)	Threatened	species info	Final designated critical habitat	Colorado Ecological Services Field Office

Species that should be considered in an effects analysis for your project under specified conditions:

Birds				
Least tern (<i>Sterna antillarum</i>) Population: interior pop.	Endangered	species info	condition info	Colorado Ecological Services Field Office
Piping Plover (<i>Charadrius melodus</i>) Population: except Great Lakes watershed	Threatened	species info	condition info	Final designated critical habitat Final designated critical habitat Colorado Ecological Services Field Office



Natural Resources of Concern

Whooping crane (<i>Grus americana</i>) Population: except where EXPN	Endangered	species info	condition info	Final designated critical habitat	Colorado Ecological Services Field Office
Fishes					
Pallid sturgeon (<i>Scaphirhynchus albus</i>) Population: Entire	Endangered	species info	condition info		Colorado Ecological Services Field Office
Flowering Plants					
Western Prairie Fringed Orchid (<i>Platanthera praeclara</i>)	Threatened	species info	condition info		Colorado Ecological Services Field Office

Critical habitats within your project area:

There are no critical habitats within your project area.

FWS National Wildlife Refuges ([USFWS National Wildlife Refuges Program](#)).

There are 1 refuges in your refuge list

Rocky Mountain Arsenal National Wildlife Refuge (303) 289-0232 6550 GATEWAY ROAD, BUILDING 121 COMMERCE CITY, CO80022	refuge profile
--	--------------------------------

FWS Migratory Birds ([USFWS Migratory Bird Program](#)).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the



U.S. Fish and Wildlife Service

Natural Resources of Concern

[Bald and Golden Eagle Protection Act](#) (16 U.S.C. 668). The Service's [Birds of Conservation Concern \(2008\)](#) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.

NWI Wetlands ([USFWS National Wetlands Inventory](#)).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate [U.S. Army Corps of Engineers District](#).

IPaC is unable to display wetland information at this time.



RECOMMENDED BUFFER ZONES AND SEASONAL RESTRICTIONS FOR COLORADO RAPTORS

Tolerance limits to disturbance vary among as well as within raptor species. As a general rule, Ferruginous Hawks and Golden Eagles respond to human activities at greater distances than do Ospreys and America Kestrels. Some individuals within a species also habituate and tolerate human activity at a proximity that would cause the majority of the group to abandon their nests. Other individuals become sensitized to repeated encroachment and react at greater distances. The tolerance of a particular pair may change when a mate is replaced with a less tolerant individual and this may cause the pair to react to activities that were previously ignored. Responses will also vary depending upon the reproductive stage. Although the level of stress is the same, the pair may be more secretive during egg laying and incubation and more demonstrative when the chicks hatch.

The term "disturbance" is ambiguous and experts disagree on what actually constitutes a disturbance. Reactions may be as subtle as elevated pulse rate or as obvious as vigorous defense or abandonment. Impacts of disturbance may not be immediately evident. A pair of raptors may respond to human intrusion by defending the nest, but well after the disturbance has passed, the male may remain in the vicinity for protection rather than forage to feed the nestlings. Golden eagles rarely defend their nests, but merely fly a half mile or more away and perch and watch. Chilling and over heating of eggs or chicks and starvation of nestlings can result from human activities that appeared not to have caused an immediate response.

A 'holistic' approach is recommended when protecting raptor habitats. While it is important for land managers to focus on protecting nest sites, equal attention should focus on defining important foraging areas that support the pair's nesting effort. Hunting habitats of many raptor species are extensive and may necessitate interagency cooperation to assure the continued nest occupancy. Unfortunately, basic knowledge of habitat use is lacking and may require documentation through telemetry investigations or intensive observation. Telemetry is expensive and may be disruptive so a more practical approach is to assume that current open space is important and should be protected.

Although there are exceptions, the buffer areas and seasonal restrictions suggested here reflect an informed opinion that if implemented, should assure that the majority of individuals within a species will continue to occupy the area. Additional factors, such as intervening terrain, vegetation screens, and the cumulative impacts of activities should be considered.

These guidelines were originally developed by CDOW raptor biologist Gerald R. Craig (retired) in December 2002. To provide additional clarity in guidance, incorporate new information, and update the conservation status of some species, the guidelines were revised in January 2008. Further revisions of this document may become necessary as additional information becomes available.

RECOMMENDED BUFFER ZONES AND SEASONAL RESTRICTIONS

BALD EAGLE

Nest Site:

No surface occupancy (beyond that which historically occurred in the area; see 'Definitions' below) within ¼ mile radius of active nests (see 'Definitions' below). Seasonal restriction to human encroachment (see 'Definitions' below) within ½ mile radius of active nests from October 15 through July 31. This closure is more extensive than the National Bald Eagle Management Guidelines (USFWS 2007) due to the generally open habitat used by Colorado's nesting bald eagles.

Winter Night Roost:

No human encroachment from November 15 through March 15 within ¼ mile radius of an active winter night roost (see 'Definitions' below) if there is no direct line of sight between the roost and the encroachment activities. No human encroachment from November 15 through March 15 within ½ mile radius of an active winter night roost if there is a direct line of sight between the roost and the encroachment activities. If periodic visits (such as oil well maintenance work) are required within the buffer zone after development, activity should be restricted to the period between 1000 and 1400 hours from November 15 to March 15.

Hunting Perch:

Diurnal hunting perches (see 'Definitions' below) associated with important foraging areas should also be protected from human encroachment. Preferred perches may be at varying distances from human encroachment and buffer areas will vary. Consult the Colorado Division of Wildlife for recommendations for specific hunting perches.

GOLDEN EAGLE

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within ¼ mile radius of active nests. Seasonal restriction to human encroachment within ½ mile radius of active nests from December 15 through July 15.

OSPREY

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within ¼ mile radius of active nests. Seasonal restriction to human encroachment within ¼ mile radius of active nests from April 1 through August 31. Some osprey populations have habituated and are tolerant to human activity in the immediate vicinity of their nests.

FERRUGINOUS HAWK

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within ½ mile radius of active nests. Seasonal restriction to human encroachment within ½ mile radius of active nests from February 1 through July 15. This species is especially prone to nest abandonment during incubation if disturbed.

RED-TAILED HAWK

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within 1/3 mile radius of active nests. Seasonal restriction to human encroachment within 1/3 mile radius of active nests from February 15 through July 15. Some members of this species have adapted to urbanization and may

tolerate human habitation to within 200 yards of their nest. Development that encroaches on rural sites is likely to cause abandonment.

SWAINSON'S HAWK

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within ¼ mile radius of active nests. Seasonal restriction to human encroachment within ¼ mile radius of active nests from April 1 through July 15. Some members of this species have adapted to urbanization and may tolerate human habitation to within 100 yards of their nest.

PEREGRINE FALCON

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within ½ mile radius of active nests. Seasonal restriction to human encroachment within ½ mile of the nest cliff(s) from March 15 to July 31. Due to propensity to relocate nest sites, sometimes up to ½ mile along cliff faces, it is more appropriate to designate 'Nesting Areas' that encompass the cliff system and a ½ mile buffer around the cliff complex.

PRAIRIE FALCON

Nest Site:

No surface occupancy (beyond that which historically occurred in the area) within ½ mile radius of active nests. Seasonal restriction to human encroachment within ½ mile radius of active nests from March 15 through July 15.

NORTHERN GOSHAWK

No surface occupancy (beyond that which historically occurred in the area) within ½ mile radius of active nests. Seasonal restriction to human encroachment within ½ mile radius of active nests from March 1 through September 15.

BURROWING OWL

Nest Site:

No human encroachment within 150 feet of the nest site from March 15 through October 31. Although Burrowing Owls may not be actively nesting during this entire period, they may be present at burrows up to a month before egg laying and several months after young have fledged. Therefore it is recommended that efforts to eradicate prairie dogs or destroy abandoned towns not occur between March 15 and October 31 when owls may be present. Because nesting Burrowing Owls may not be easily visible, it is recommended that targeted surveys be implemented to determine if burrows are occupied. More detailed recommendations are available in a document entitled "Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls" which is available from the Colorado Division of Wildlife

Recommended Buffer Zones and Seasonal Restrictions Around Raptor Use Sites

Species and Use	Buffer	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bald Eagle													
ACTIVE NEST - No Surface Occupancy	1/4 Mile												
ACTIVE NEST - No Human Encroachment	1/2 Mile												
ACTIVE WINTER NIGHT ROOST without a direct line of sight- No Human Encroachment	1/4 Mile												
ACTIVE WINTER NIGHT ROOST with a direct line of sight - No Human Encroachment	1/2 Mile												
HUNTING PERCH - No Human Encroachment	Contact CDOW												
Golden Eagle													
ACTIVE NEST - No Surface Occupancy	1/4 Mile												
ACTIVE NEST - No Human Encroachment	1/2 Mile												
Osprey													
ACTIVE NEST - No Surface Occupancy	1/4 Mile												
ACTIVE NEST - No Human Encroachment	1/4 Mile												
Ferruginous Hawk													
ACTIVE NEST - No Surface Occupancy	1/2 Mile												
ACTIVE NEST - No Human Encroachment	1/2 Mile												
Red-tailed Hawk													
ACTIVE NEST - No Surface Occupancy	1/3 Mile												
ACTIVE NEST - No Human Encroachment	1/3 Mile												
Swainson's Hawk													
ACTIVE NEST - No Surface Occupancy	1/4 Mile												
ACTIVE NEST - No Human Encroachment	1/4 Mile												
Peregrine Falcon													
ACTIVE NEST - No Surface Occupancy	1/2 Mile												
ACTIVE NEST - No Human Encroachment	1/2 Mile												
Prairie Falcon													
ACTIVE NEST - No Surface Occupancy	1/2 Mile												
ACTIVE NEST - No Human Encroachment	1/2 Mile												
Northern Goshawk													
ACTIVE NEST - No Surface Occupancy	1/2 Mile												
ACTIVE NEST - No Human Encroachment	1/2 Mile												
Burrowing Owl													
ACTIVE NEST - No Human Encroachment	150 feet												

= time period for which seasonal restrictions are in place.

DEFINITIONS

Active nest – Any nest that is frequented or occupied by a raptor during the breeding season, or which has been active in any of the five previous breeding seasons. Many raptors use alternate nests in various years. Thus, a nest may be active even if it is not occupied in a given year.

Active winter night roost – Areas where Bald Eagles gather and perch overnight, and sometimes during the day in the event of inclement weather. Communal roost sites are usually in large trees (live or dead) that are relatively sheltered from wind and are generally in close proximity to foraging areas. These roosts may also serve a social purpose for pair bond formation and communication among eagles. Many roost sites are used year after year.

Human encroachment – Any activity that brings humans in the area. Examples include driving, facilities maintenance, boating, trail access (e.g., hiking, biking), etc.

Hunting perch – Any structure on which a raptor perches for the purpose of hunting for prey. Hunting perches provide a view of suitable foraging habitat. Trees are often used as hunting perches, but other structures may also be used (utility poles, buildings, etc.).

Surface occupancy – Any physical object that is intended to remain on the landscape permanently or for a significant amount of time. Examples include houses, oil and gas wells, tanks, wind turbines, roads, tracks, etc.

CONTACT

For further information contact:

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Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
Phone: 303-291-7320
Email: david.klute@state.co.us

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Revised 02/2008

I-76 & Bridge Street INTERCHANGE



Wetland Finding

Technical Report

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List of acronyms and abbreviations

AA	Assessment Area
AOI	Area of interest
BMP	Best management practice
Brighton	City of Brighton
CDOT	Colorado Department of Transportation
EA	Environmental Assessment
FACWet	Functional Assessment of Colorado Wetlands
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
GPS	Global positioning system
LOS	Level of service
OHWM	Ordinary high water mark
PEM	Palustrine emergent
ROW	Right of way
SWMP	Stormwater Management Plan
USACE	U.S. Army Corps of Engineers
WUS	Waters of the United States

1. Introduction

The I-76 and Bridge Street Interchange Environmental Assessment (EA) is a joint effort between the City of Brighton (Brighton), the Federal Highway Administration (FHWA), and the Colorado Department of Transportation (CDOT). This EA will identify potential impacts of the proposed interchange on the built and natural environment. Brighton proposes constructing a new interchange at Bridge Street and I-76 in eastern Brighton. The project is located in Adams County, Colorado, approximately 25 miles northeast of Denver. The wetlands study area is defined as the area surrounding the Bridge Street overpass over I-76, including the interstate, the frontage roads, and Bridge Street (Exhibit 1-1).

Exhibit 1-1. Project Area



The purpose of the project is to increase local and regional east-west connectivity, reduce the amount of travel delay through the future design year of 2035, and improve traffic flow and access in the project area. The need for the project results from the lack of local and regional connectivity, current and projected congestion and associated travel delay, and poor current and future traffic flow on the frontage roads.

The proposed interchange provides an opportunity to increase regional east-west connectivity, which will become increasingly important with future population growth and increased travel demand.

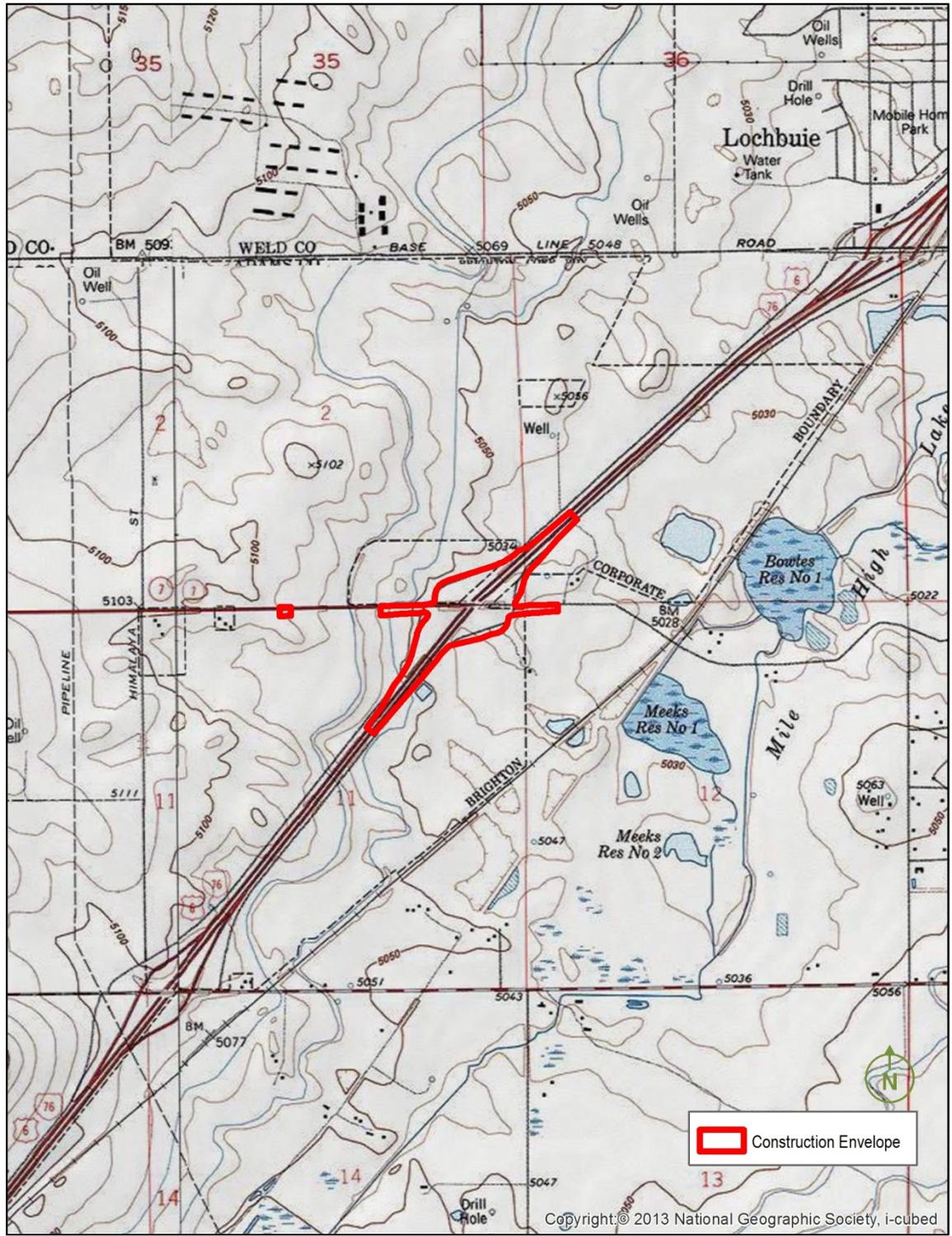
This report has been prepared as required by CDOT because permanent wetland impacts would exceed 500 square feet. The following is a Wetland Finding for the project and has been written in compliance with Executive Order 11990, "Protection of Wetlands," and in accordance with 23 Code of Federal Regulations [CFR] 771, 23 CFR 777, and FHWA Technical Advisory T6640.8A (Federal Register, 1977).

1.1 Project Location

The proposed project is located at the I-76 and Bridge Street intersection within the City of Brighton, Colorado (see Exhibit 1-2). The approximate geographical location of the project is centered at decimal degree coordinates (North American Datum [NAD] 83) latitude 39.986913°, longitude -104.735925°. The

project is located in parts of Sections 2 and 11, Township 1 South, Range 65 West of the 6th Principal Meridian on the United States Geological Survey (USGS) Mile High Lakes, Colorado 7.5-Minute Quadrangle (USGS, 1994). The elevation of the site is approximately 5,060 feet above mean sea level (msl).

Exhibit 1-2. Site Location



1.2 Project Description and Alternatives

1.2.1 No-Action Alternative

The No-Action Alternative serves as the baseline against which Action Alternatives were compared. For the purposes of this study, the No-Action Alternative is defined as the existing facilities within the project area. Under the No-Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

1.2.2 Preferred Alternative: Two-Roundabout Interchange Design

The Preferred Alternative is the Two-Roundabout Interchange. This alternative combines the frontage roads and ramp terminals to make one six-legged roundabout on both the east and west sides of I-76. This alternative meets the project Purpose and Need. It preserves the existing bridge, can be designed within the existing right of way (ROW), and avoids impacts to the Speer Canal to the northwest of the interchange. This alternative is expected to operate at level of service (LOS) B in the year 2035.

Each roundabout has an outside diameter of 200 feet, including a 12-foot truck apron for truck traffic. To develop approach angles as a traffic-calming technique and to lessen ROW impacts, both roundabouts have been placed off center of the existing Bridge Street center line. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements. This alternative has the least amount of access points among the Action Alternatives.

1.2.3 Alternative 2: Four-Roundabout Interchange Design

Alternative 2 is the Four-Roundabout Interchange, which creates two four-legged roundabouts on each side (east and west) of I-76. This alternative meets the project Purpose and Need. It preserves the existing bridge and has minor ROW impacts. This alternative is expected to operate at LOS B in the year 2035.

The two four-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 110 feet, including a 12-foot truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts have been placed slightly off center of the existing Bridge Street center line to develop approach angles as a traffic-calming technique and to lessen ROW impacts. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

1.2.4 Alternative 3: Three-Roundabout Interchange Design

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76. The West Frontage Road and I-76 westbound ramps are combined into one six-legged roundabout with an outside diameter of 200 feet, including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one four-legged roundabout and the frontage roads into another four-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet, including a 12-foot truck apron. This alternative meets the project Purpose and Need. It preserves the existing bridge and has minor ROW impacts, primarily to the east. The two four-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. This alternative is expected to operate at LOS B in the year 2035.

For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed slightly off center of the existing Bridge Street center line to develop approach angles as a traffic-calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with an 18-foot single lane for circulation and exclusive right turn bypasses for the ramp-to-frontage-road and frontage-road-to-ramp movements.

2. Methods

Pinyon Environmental, Inc., biologist Tim DeMasters visited the site on September 12, 2013, to delineate waters of the United States (WUS), including wetlands and open waters, within the study area. While in the field, wetlands and boundaries of waterways (open waters) were recorded with a Trimble GeoXH6000 global positioning system (GPS) unit. The GPS data were downloaded and mapped in ArcGIS 10.1 mapping software. The delineated wetlands and the ordinary high water mark (OHWM) were flagged during the site visit. Photographs of wetland areas were taken while in the field (Appendix A).

The wetland delineation was completed in accordance with the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE, 1987), and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation; Great Plains Regional Supplement (USACE, 2010). Wetlands were defined by vegetative, hydrologic, and soil features, and the data were recorded onto field data forms (Appendix B). Sampling points were placed in representative locations, as shown on Exhibit 3-1. In addition, CDOT's Functional Assessment of Colorado Wetlands (FACWet) Method (Johnson, et al, 2013) also was completed.

2.1 Field Methodology

Vegetation was identified and documented within the strata-specific sampling radii recommended by the USACE (30 feet for trees, 15 feet for shrubs, five feet for herbs, and 15 feet for woody vines) (USACE, 2010). Additional plant species located outside of the sampling point, but within the sampled plant community, are noted on the data forms as needed to better describe the nearby vegetation. Wetland indicator status for plant species was referenced in the National Wetland Plant List Final Draft Ratings (USACE, 2012). Species were classified as OBL (obligate wetland species), FACW (facultative wetland species), FAC (facultative species), FACU (facultative upland), or UPL (upland species). Plant species classified as FAC, FACW, or OBL are considered hydrophytic plants, and are wetland indicators. Wetlands also were classified using the Cowardin classification system (Cowardin, et al., 1979). Classifications are further described in the results section.

Hydrology and soil data also were collected at the sampling points. Hydrology indicators may include topographic positions, presence of standing water and/or saturated soil, profile conditions, drainage patterns, water marks, sediment deposits, and/or oxidized root channels in the upper 18 inches of the soil profile. Wetland soil indicators may include the presence of color streaking (mottling), gleying (greyish coloration), reducing conditions, hydrogen sulfide odor, high organic content, and organic matter streaking in the surface layer of sandy soils. Soil pits were hand-excavated adjacent to potential wetlands to verify indicators of vegetation, wetland hydrology, and hydric soils.

2.2 FACWet Methodology

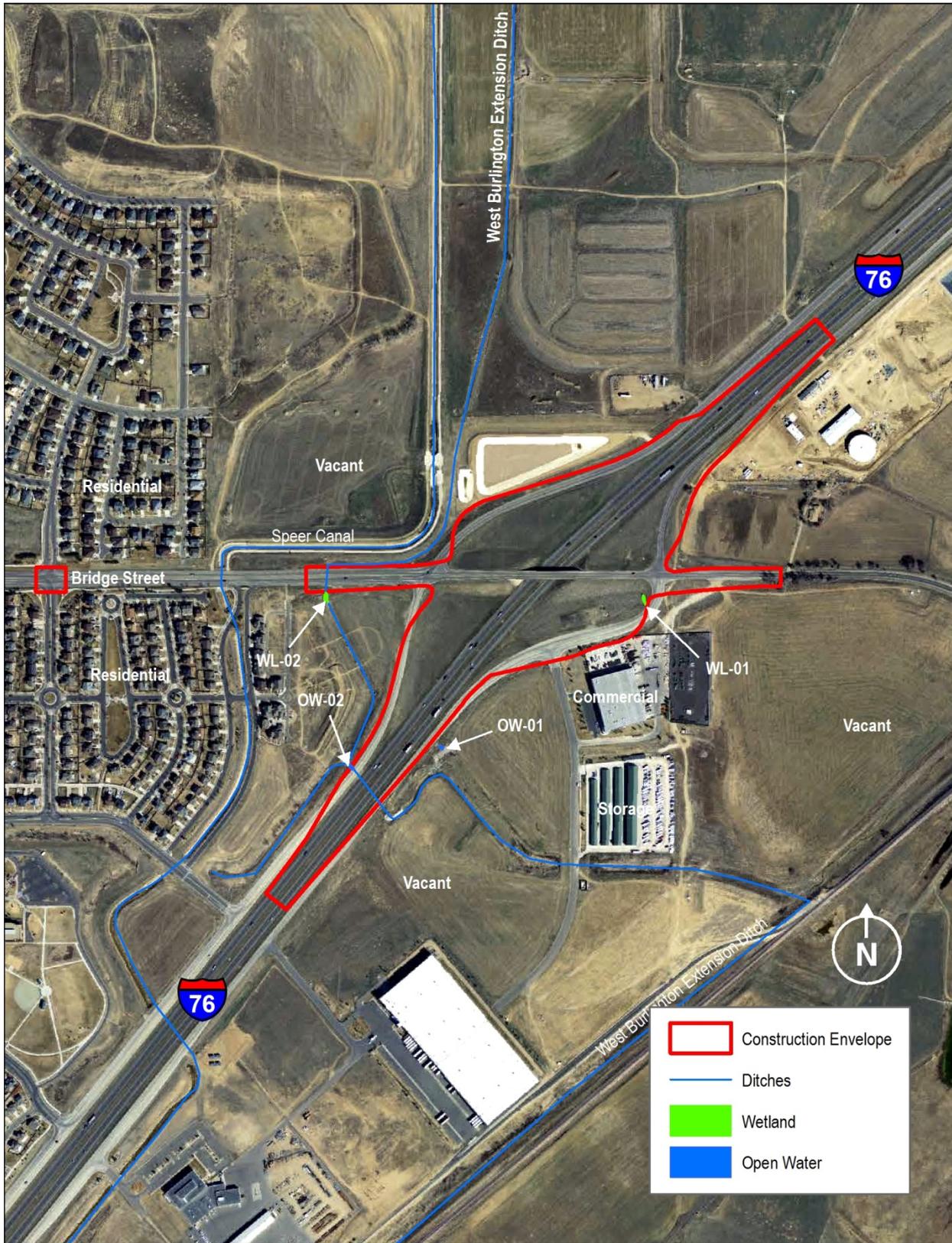
The Area of Interest (AOI) encompasses the area that could be directly or indirectly impacted by project activities, or the "Predicted Extent of Indirect Impacts." Per the FACWet methodology, the AOI was defined to the predicted extent of indirect impacts. Within the AOI, areas of target habitat (wetlands) were defined as Assessment Areas (AAs). The FACWet data sheets for each AA are included as Appendix C.

3. Results

3.1 General Site Conditions

Once a largely agricultural community, land in the immediate vicinity of the I-76 and Bridge Street intersection is primarily undeveloped (Exhibit 3-1). West of I-76, there is residential development, and there is additional planned residential and commercial growth on both the east and west sides of the interstate. Future planned land uses include further industrial, employment, mixed-use, high-density residential, and agricultural development. A new, high-density neighborhood is being developed on the northwest corner of I-76 and Bridge Street.

Exhibit 3-1. General Site Conditions



3.1.1 Upland Vegetation

The proposed project generally would be located within existing roadway ROW. Given the presence of the roadway and bridge, it is likely that the natural vegetation, soils, and hydrology have been altered by filling, grading, and improvement activities in the past.

Upland habitat types within the study area include upland native or planted grasses intermixed with sporadic weedy roadside habitat, and landscaped areas. Dominant species along much of the upland habitats includes: smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), sand dropseed (*Sporobolus cryptandrus*), bulbous bluegrass (*Poa bulbosa*), witchgrass (*Panicum capillare*), sideoats grama (*Bouteloua curtipendula*), needle and thread grass (*Hesperostipa comata ssp. comata*), little bluestem (*Schizachyrium scoparium*), prairie sandreed (*Calamovilfa longifolia*) and sand bluestem (*Andropogon hallii*). Common herbaceous species were kochia (*Bassia scoparia*), curly dock (*Rumex crispus*), and alfalfa (*Medicago sativa*). Scattered shrubs and trees in these areas included rabbitbrush (*Chrysothamnus nauseous*), Siberian elms (*Ulmus pumila*), and plains cottonwoods (*Populus deltoides*).

3.1.2 Hydrology

The primary hydrologic feature within the project area is West Burlington Extension Ditch, which flows toward the north (Exhibit 3-1). The study area also receives stormwater runoff from the current I-76 and Bridge Street roadways.

3.1.3 General Soils

There are three main soil types mapped within the immediate study area (USDA, 2013a). These are:

- The **Vona sandy loam, 1- to 3-percent slopes**, soil series is classified as well drained, and consists of sandy loam and loamy sand. These soils are sandy eolian deposits, generally found in sandy plains, and comprise the majority of the soils in the northern portion of the study area.
- The **Ascalon sandy loam, 1- to 3-percent slopes**, soil series is classified as well drained, and consists of sandy loam and sandy clay loam. These soils are eolian deposits from mixed materials, generally found in sandy plains, and comprise the majority of the soils in the middle and southern portion of the study area.
- The **Vona sandy loam, 3- to 9-percent slopes**, soil series is classified as well drained, and consists of sandy loam and loamy sand. These soils are sandy eolian deposits, generally found in sandy plains, and are found in the very southern portion of the study area.

The soils observed within the sampling points in both the wetlands and upland areas were sands and silty sands (Appendix B).

3.2 Wetlands and Open Waters

Two wetland areas and two open water features were identified within the study area (Exhibit 1-1). The following sections discuss each wetland and open water feature.

3.2.1 Wetland-01

Wetland-01 (WL-01) is located on the southwest corner of the intersection of the East Frontage Road and Bridge Street, on the east side of I-76. WL-01 is a palustrine emergent (PEM) wetland dominated by narrowleaf cattails (*Typha angustifolia*), an obligate herbaceous wetland species (Cowardian, et al., 1979). The wetland hydrology indicators included surface water in some areas, saturated soils, and a hydrogen sulfide odor. The hydric soil indicator was a depleted matrix with some redox concentrations present. Sampling Point 4 (SP-4) was completed in WL-01, and the data sheet for this sampling point provides additional information on the wetland indicators observed within WL-01 (Appendix B).

3.2.2 Wetland-02

Wetland-02 (WL-02) was delineated south of Bridge Street, and west of I-76 and the West Frontage Road. WL-02 was a PEM wetland dominated by narrowleaf cattails, marsh muhly (*Muhlenbergia racemosa*), giant ragweed (*Ambrosia trifida*), and curly dock (Cowardian, et al., 1979). The wetland hydrology indicators

included surface water in some areas, saturated soils, and drainage patterns. The hydric soil indicator was sandy redox with some redox concentrations present. Sampling Point 2 (SP-2) was completed in WL-02, and the data sheet for this sampling point provides additional information on the wetland indicators observed within WL-02 (Appendix B).

3.2.3 Open Waters 01 and 02

Two open water areas (OW-01 and OW-02) were also identified in the study area (Exhibit 1-1). These areas appear to be associated with the West Burlington Extension Ditch. Water in the ditch was likely the result of heavy rains prior to the field survey.

3.3 FACWet

The wetland areas are grouped into AAs to analyze the functional capacity of the wetlands, per CDOT's FACWet methodology. AAs are typically based on hydrogeomorphic class, wetland type, and location within the AOI. The AOI included the I-76 and Bridge Street area (see Exhibit 3-3). There were two wetland areas within the AOI. The wetland areas have been grouped into a single AA (AA-1) based on hydrogeomorphic class, wetland type, and plant community. WL-01 and WL-02 are both PEM wetlands with similar hydrological sources.

FACWet scores were recorded as Functional Capacity Indices (FCI). FCI score values are interpreted as shown in Exhibit 3-2 below.

Exhibit 3-2 Functional Capacity Indices Descriptions

FCI Score	Functional Category	Interpretation
1.0–0.9	Reference Standard	AA is functioning at or near its Reference Standard capacity.
<0.9–0.8	Highly Functioning	AA retains all of its natural functions. While the capacity of some or all have been altered somewhat, the function of the wetland is still fundamentally sound.
<0.8–0.7	Functioning	The capacity of some or all of the AA's functions has been markedly altered, but the wetland still provides the types of functions associated with its habitat type.
<0.7–0.6	Functioning Impaired	The functioning of the wetland has been severely altered. Certain functions may be nearly extinguished or they may be grossly altered to be more representative of a different class of wetland (e.g., a fen converted to a depressional system). Despite the profound changes, the AA still supports wetland habitat.
<0.6	Non-functioning	The AA no longer possesses the basic criteria necessary to support wetland conditions.

The overall FACWet Functional Capacity Index for AA-1 was 0.67, meaning that there has been obvious alteration and degradation of the wetland, but that it still supports basic wetland functioning, but at an impaired level (Appendix C). There are three main stressors for AA-1:

1. The presence of the I-76 corridor and frontage roads
2. Nearby commercial, residential, and industrial development
3. The presence of weeds within the AOI and AA.

These three stressors contribute to a degradation of the functioning of migration and dispersal of organisms that use the wetland, the water source, distribution of water within the AA, the outflow of water from the AA, the geomorphology, and the chemical environment.

Exhibit 3-3. FACWet Wetlands Areas



4. Impacts

As previously described, wetlands were measured by collecting GPS data in the field. This information was post-processed and corrected by a Geographic Information Systems (GIS) specialist, then incorporated into the project plan set to evaluate the acreage affected by the project. There would be no direct or indirect impacts to wetlands under the No-Action Alternative. All three Action Alternatives would have the same impacts to wetlands; therefore, the impact discussion below is for all three Action Alternatives.

4.1 Direct Impacts

4.1.1 Wetland Impacts

All three Action Alternatives would result in the same permanent direct impacts to one wetland, WL-01 (see Exhibit 4-1). Impacts were avoided to the extent possible but the location of the I-76 northbound off-ramp and the turning radius required for trucks made the impact to WL-01 unavoidable. Most of the direct permanent wetland impacts would be due to construction of the roadway alignment. Because CDOT requires mitigation of all wetland impacts, regardless of whether they are jurisdictional, this report breaks out wetlands anticipated to be jurisdictional for the purposes of USACE permitting and also identifies the total amount of wetlands present.

Exhibit 4-1. Wetland Impacts

Wetland ID	Wetland Location	Wetland Classification	Total Wetland Area	Action Alternative Permanent Impact ¹	No-Action Alternative Permanent Impact ¹	Jurisdictional Status ²
WL-01	Southwest corner of the intersection of East Frontage Road and Bridge Street, on the east side of I-76	PEM	0.01 ac (585 sf)	0.01 ac (585 sf)	0 ac (0 sf)	Unlikely, but Assumed Jurisdictional
WL-02	South of Bridge Street, and west of I-76 and West Frontage Road	PEM	0.02 ac (872 sf)	0 ac (0 sf)	0 ac (0 sf)	Jurisdictional
Total Wetland Impacts			0.03 ac (1,457 sf)	0.01 (585 sf)	0 ac (0 sf)	—

¹ Impact is the same for all Action Alternatives

² Assumed Jurisdictional status based on project review; however, only the USACE has final say in determination

ac = acres

sf = square feet

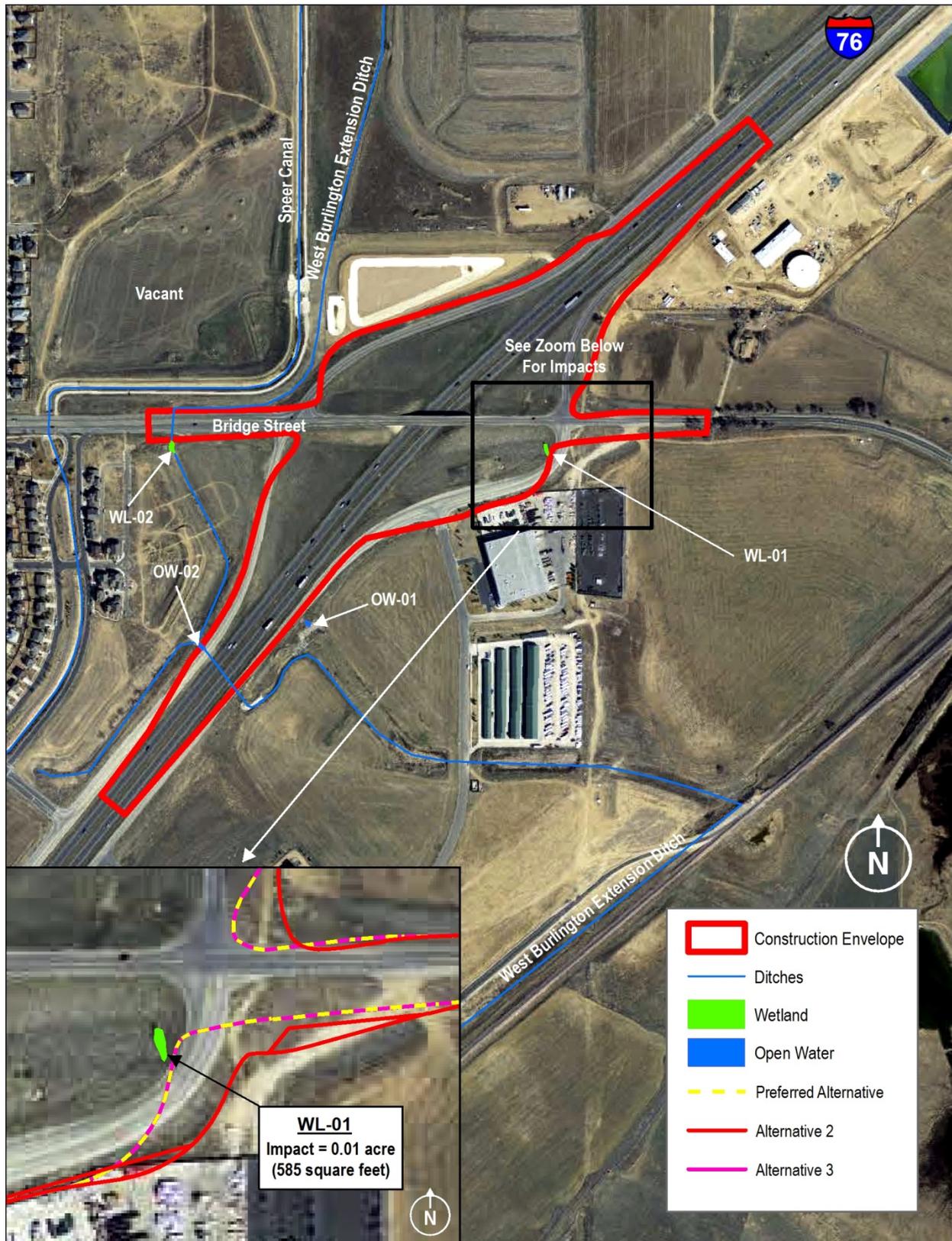
4.1.2 Open Waters Impacts

There would be no impacts to open waters in the project area.

4.2 Indirect Impacts

Indirect impacts could result from construction activities. These indirect impacts will be minimized by the implementation of a Stormwater Management Plan (SWMP). Construction activities disturb the ground, which increases the likelihood of noxious weeds becoming established. This will be minimized by re-seeding upland and wetland areas disturbed by construction with native species in accordance with Sections 207, 212, and 217 of the CDOT Standard Specifications, and for implementing the standard CDOT Best Management Practices (BMPs). This information is summarized in the project's Biological Resources Report, presented under separate cover.

Exhibit 4-2. Wetland Impacts



5. Mitigation

5.1 Mitigation of Permanent Wetland Impacts

Per Section 404 of the Clean Water Act, impacts to wetlands and other water features must be avoided, minimized, or mitigated (in order of preference). CDOT policy requires all wetland impacts to be mitigated, regardless of jurisdiction or magnitude. All mitigation for the wetlands within the study area also will be in accordance with CDOT policy.

The study area was evaluated for the potential for onsite mitigation for the 0.01 acre (585 square feet) of permanent impacts to wetlands. Because of insufficient natural hydrology and ROW requirements, the reestablishment of wetlands onsite would be difficult. Major drainage, hydrological, and slope changes would be needed for onsite mitigation. Onsite mitigation would result in a costly and time-consuming process, with no guarantee of the establishment of a successful wetland habitat. Therefore, the project may need to purchase credits from a wetland mitigation bank. Three USACE-approved banks are located within the same watershed as the project, including the Middle South Platte, Mile High, and Riverdale Wetland Mitigation Banks.

5.2 Mitigation of Indirect Wetland Impacts

As mentioned above, indirect impacts would be minimized through the implementation of a SWMP and CDOT BMPs.

5.3 Section 404 Permitting

Although the impacted wetland (WL-01) is isolated and not likely under the jurisdiction of the USACE, jurisdictional status is assumed because, due to the minimal impact to wetlands, this project would likely be covered under a Section 404 Nationwide Permit.

Since the Action Alternatives will discharge to a wetland, a PCN is required from the USACE; an official jurisdictional determination from the USACE is not recommended at this time.

6. Closing Statement

Based on the above considerations, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

7. References

- Cowardin et al, 1979. Cowardin, L.M., V. Carter V., F.C. Golet, E.T. LaRoe. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31. Washington, D.C. 1979.
- Federal Register, 1977. *The Provisions of Executive Order 11990 (Protection of Wetlands)*, 42 FR 26961, 3 CFR, 1977, page 121. The Federal Register, May 24, 1977.
- Johnson, Brad, Mark Beardsley, and Jessica Doran, 2013. *Colorado Department of Transportation's Functional Assessment of Colorado Wetlands (FACWet) Method Version 3.0*. Colorado Department of Transportation, April 2013.
- USACE, 1987. *U.S. Army Corps of Engineers Wetland Delineation Manual*, United States Army Corps of Engineers Wetland Training Institute, January 1987.
- USACE, 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)*," United States Army Corps of Engineers, March 2010.
- USACE, 2012. *National Wetland Plant List Final Draft Ratings*, United States Army Corps of Engineers, 2012.
- USDA, 2013. *Web Soil Survey*. websoilsurvey.nrcs.usda.gov. United States Department of Agriculture, Natural Resources Conservation Service, website accessed October 2013.
- USGS, 1994. *Mile High Lakes, Colorado 7.5 Minute Quadrangle*. United States Geological Service, 1966 (Revised 1994).

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Appendices

Appendix A: Photographic Log

Appendix B: USACE Data Forms

Appendix C: FACWet Data Forms

Photo 1.
Sampling Point 1
at Wetland 02.
Facing northeast.



Photo 2.
Sampling point 2
at Wetland 02.
Facing south.



Photo 3.
Sampling point 3
at Wetland 01.
Facing west.



Photo 4.
Sampling point 4
at Wetland 01.
Facing northeast.



Appendix B

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: I-76 and Bridge Street City/County: Brighton / Adams Sampling Date: 9/12/2013
 Applicant/Owner: CDOT State: CO Sampling Point: SP1
 Investigator(s): TJD Section, Township, Range: Sec 11, T 1 S, R 66 W
 Landform (hillslope, terrace, etc.): Drainage Area Local relief (concave, convex, none): Convex Slope (%): 1
 Subregion (LRR): G -Western Great Plains Range and Irrigated Region Lat: 39.986695 Long: -104.740024 Datum: NAD 83
 Soil Map Unit Name: Vona sandy loam, 1 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X*</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: Area is experiencing heavy rains and flooding. This site has some flowing water towards one side more than it normally would be.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Bomus inermis</u>	<u>95</u>	<u>Y</u>	<u>UPL</u>	
2. <u>Rumex crispus</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
3. <u>Convolvulus arvensis</u>	<u>2</u>	<u>N</u>	<u>UPL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
100 = Total Cover				
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
100 = Total Veg Cover				
% Bare Ground in Herb Stratum _____				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)
 Total Number of Dominant Species Across All Strata: 0 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = 0
 FACW species _____ x 2 = 0
 FAC species 3 x 3 = 9
 FACU species _____ x 4 = 0
 UPL species 97 x 5 = 485
 Column Totals: 100 (A) 494.00 (B)
 Prevalence Index = B/A = 4.94

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
All dominants are FACW and/or OBL.
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: _____

D5 - FAC Neutral Test for hydrology. Drop all FAC, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.

SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10 YR 4/2	100					Silty Sand	
2-18	10 YR 4/4	100					Silty Sand	Medium coarse grains
8-16	10 YR 4/3	100					Silty Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1) (p42)
- Histic Epipedon (A2) (p43)
- Black Histic (A3) (p44)
- Hydrogen Sulfide (A4) (p45)
- Stratified Layers (A5) (LRR F) (p46)
- 1 cm Muck (A9) (LRR F, G, H) (p47)
- Depleted Below Dark Surface (A11) (p48)
- Thick Dark Surface (A12) (p50)
- Sandy Mucky Mineral (S1) (p51)
- 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)⁽⁵²⁾
- 5 cm Mucky Peat or Peat (S3) (LRR F) (p52)
- Sandy Gleyed Matrix (S4) (p53)
- Sandy Redox (S5) (p53)
- Stripped Matrix (S6) (p54)
- Loamy Mucky Mineral (F1) (p55)
- Loamy Gleyed Matrix (F2) (p56)
- Depleted Matrix (F3) (p57)
- Redox Dark Surface (F6) (p58)
- Depleted Dark Surface (F7) (p60)
- Redox Depressions (F8) (p61)
- High Plains Depressions (F16) (p62) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR I, J) (p64)
 - Coast Prairie Redox (A16) (LRR F, G, H) (p64)
 - Dark Surface (S7) (LRR G) (p65)
 - High Plains Depressions (F16) (p65) (LRR H outside of MLRA 72 & 73)
 - Reduced Vertic (F18) (p66)
 - Red Parent Material (TF2) (p67)
 - Very Shallow Dark Surface (TF12) (p67)
 - Other (Explain in Remarks)
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1) (p73)
- High Water Table (A2) (p74)
- Saturation (A3) (p76)
- Water Marks (B1) (p77)
- Sediment Deposits (B2) (p77)
- Drift Deposits (B3) (p79)
- Algal Mat or Crust (B4) (p79)
- Iron Deposits (B5) (p81)
- Inundation Visible on Aerial Imagery (B7) (p82)
- Water-Stained Leaves (B9) (p82)
- Salt Crust (B11) (p83)
- Aquatic Invertebrates (B13) (p84)
- Hydrogen Sulfide Odor (C1) (p88)
- Dry-Season Water Table (C2) (p89)
- Oxidized Rhizospheres on Living Roots (C3) (where not tilled) (p91)
- Presence of Reduced Iron (C4) (p89)
- Thin Muck Surface (C7) (p90)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6) (p86)
- Sparsely Vegetated Concave Surface (B8) (p86)
- Drainage Patterns (B10) (p87)
- Oxidized Rhizospheres on Living Roots (C3) (p91) (where tilled)
- Crayfish Burrows (C8) (p93)
- Saturation Visible on Aerial Imagery (C9) (p94)
- Geomorphic Position (D2) (p95)
- FAC-Neutral Test (D5) (p95)
- Frost-Heave Hummocks (D7) (LRR F) (p96)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____
 Water Table Present? Yes _____ No _____ Depth (inches): _____
 Saturation Present? Yes X _____ No _____ Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

*While saturation was present, the site investigation occurred during a heavy precip. event, and would not normally show saturation in the upper 12". The lack of other hydrologic indicators supports this at this sampling point.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: I-76 and Bridge Street City/County: Brighton / Adams Sampling Date: 9/12/2013
 Applicant/Owner: CDOT State: CO Sampling Point: SP2
 Investigator(s): TJD Section, Township, Range: Sec 11, T 1 S, R 66 W
 Landform (hillslope, terrace, etc.): Drainage Area Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR): G -Western Great Plains Range and Irrigated Region Lat: 39.986612° Long: -104.739975° Datum: NAD 83
 Soil Map Unit Name: Vona sandy loam, 1 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Area is experiencing heavy rains and flooding. This site has some flowing water towards one side more than it normally would be.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC species _____ x 3 = <u>0</u> FACU species _____ x 4 = <u>0</u> UPL species _____ x 5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0.00</u> (B) Prevalence Index = B/A = <u>NaN</u>
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <u>X</u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Typha angustifolia</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Rumex crispus</u>	<u>7</u>	<u>N</u>	<u>FAC</u>	
3. <u>Ambrosia trifida</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
4. <u>Muhlenbergia racemosa</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
67 = Total Cover				
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
% Bare Ground in Herb Stratum _____ = Total Veg Cover <u>67</u>				
Remarks:				

D5 - FAC Neutral Test for hydrology. Drop all FAC, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: I-76 and Bridge Street City/County: Brighton / Adams Sampling Date: 9/12/2013
 Applicant/Owner: CDOT State: CO Sampling Point: SP3
 Investigator(s): TJD Section, Township, Range: Sec 11, T 1 S, R 66 W
 Landform (hillslope, terrace, etc.): Roadway intersection corner Local relief (concave, convex, none): Flat Slope (%): 1
 Subregion (LRR): G -Western Great Plains Range and Irrigated Region Lat: 39.986566° Long: -104.734195° Datum: NAD 83
 Soil Map Unit Name: Vona sandy loam, 1 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X*</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: Area is experiencing heavy rains and flooding. This site has some flowing water towards one side more than it normally would be.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5 Ft radius</u>)				
1. <u>Agropyron cristatum</u>	15	Y	UPL	
2. <u>Bouteloua curtipendula</u>	15	Y	UPL	
3. <u>Convolvulus arvensis</u>	20	Y	UPL	
4. <u>Pascopyrum (Agropyron) smithii</u>	15	Y	FACU	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
65 = Total Cover				
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>20</u>	_____	_____	_____	_____ = Total Veg Cover

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)
 Total Number of Dominant Species Across All Strata: 0 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = 0
 FACW species _____ x 2 = 0
 FAC species _____ x 3 = 0
 FACU species 15 x 4 = 60
 UPL species 50 x 5 = 250
 Column Totals: 65 (A) 310 (B)
 Prevalence Index = B/A = 4.77

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
All dominants are FACW and/or OBL.
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: D5 - FAC Neutral Test for hydrology. Drop all FAC, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.

SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10 YR 4/3	100					Silty Sand	
2-18	10 YR 4/4	100					Silty Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)(p42)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) (p53)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J) (p64)
<input type="checkbox"/> Histic Epipedon (A2) (p43)	<input type="checkbox"/> Sandy Redox (S5) (p53)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H) (p64)
<input type="checkbox"/> Black Histic (A3) (p44)	<input type="checkbox"/> Stripped Matrix (S6) (p54)	<input type="checkbox"/> Dark Surface (S7) (LRR G) (p65)
<input type="checkbox"/> Hydrogen Sulfide (A4) (p45)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (p55)	<input type="checkbox"/> High Plains Depressions (F16)(p65)
<input type="checkbox"/> Stratified Layers (A5) (LRR F) (p46)	<input type="checkbox"/> Loamy Gleyed Matrix (F2) (p56)	(LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H) (p47)	<input type="checkbox"/> Depleted Matrix (F3) (p57)	<input type="checkbox"/> Reduced Vertic (F18) (p66)
<input type="checkbox"/> Depleted Below Dark Surface (A11)(p48)	<input type="checkbox"/> Redox Dark Surface (F6) (p58)	<input type="checkbox"/> Red Parent Material (TF2)(p67)
<input type="checkbox"/> Thick Dark Surface (A12)(p50)	<input type="checkbox"/> Depleted Dark Surface (F7) (p60)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)(p67)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (p51)	<input type="checkbox"/> Redox Depressions (F8) (p61)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) ⁽⁵²⁾	<input type="checkbox"/> High Plains Depressions (F16) (p62)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)(p52)	(MLRA 72 & 73 of LRR H)	

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u> _____
Remarks: _____	

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) (p73)	<input type="checkbox"/> Salt Crust (B11) (p83)	<input type="checkbox"/> Surface Soil Cracks (B6) (p86)
<input type="checkbox"/> High Water Table (A2) (p74)	<input type="checkbox"/> Aquatic Invertebrates (B13) (p84)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) (p86)
<input type="checkbox"/> Saturation (A3) (p76)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1) (p88)	<input type="checkbox"/> Drainage Patterns (B10) (p87)
<input type="checkbox"/> Water Marks (B1) (p77)	<input type="checkbox"/> Dry-Season Water Table (C2) (p89)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (p91)
<input type="checkbox"/> Sediment Deposits (B2) (p77)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) (p91)	<input type="checkbox"/> Crayfish Burrows (C8) (p93)
<input type="checkbox"/> Drift Deposits (B3) (p79)	<input type="checkbox"/> Presence of Reduced Iron (C4) (p89)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) (p94)
<input type="checkbox"/> Algal Mat or Crust (B4) (p79)	<input type="checkbox"/> Thin Muck Surface (C7) (p90)	<input type="checkbox"/> Geomorphic Position (D2) (p95)
<input type="checkbox"/> Iron Deposits (B5) (p81)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5) (p95)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) (p82)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) (p96)
<input type="checkbox"/> Water-Stained Leaves (B9) (p82)		

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u> _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____	
Remarks: No hydrologic features.	

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: I-76 and Bridge Street City/County: Brighton / Adams Sampling Date: 9/12/2013
 Applicant/Owner: CDOT State: CO Sampling Point: SP4
 Investigator(s): TJD Section, Township, Range: Sec 11, T 1 S, R 66 W
 Landform (hillslope, terrace, etc.): Drainage Area Local relief (concave, convex, none): Convex Slope (%): 1
 Subregion (LRR): G -Western Great Plains Range and Irrigated Region Lat: 39.986584° Long: -104.734130° Datum: NAD 83
 Soil Map Unit Name: Vona sandy loam, 1 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 Ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
0 = Total Cover				Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>0</u> (A)</td> <td><u>0.00</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>NaN</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = <u>0</u>	FACW species _____	x 2 = <u>0</u>	FAC species _____	x 3 = <u>0</u>	FACU species _____	x 4 = <u>0</u>	UPL species _____	x 5 = <u>0</u>	Column Totals: <u>0</u> (A)	<u>0.00</u> (B)	Prevalence Index = B/A = <u>NaN</u>	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = <u>0</u>																			
FACW species _____	x 2 = <u>0</u>																			
FAC species _____	x 3 = <u>0</u>																			
FACU species _____	x 4 = <u>0</u>																			
UPL species _____	x 5 = <u>0</u>																			
Column Totals: <u>0</u> (A)	<u>0.00</u> (B)																			
Prevalence Index = B/A = <u>NaN</u>																				
Sapling/Shrub Stratum (Plot size: <u>15 Ft radius</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
0 = Total Cover																				
Herb Stratum (Plot size: <u>5 Ft radius</u>)																				
1. <u>Typha angustifolia</u>	<u>100</u>	<u>Y</u>	<u>OBL</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
100 = Total Cover																				
Woody Vine Stratum (Plot size: <u>15 Ft radius</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
_____ = Total Cover																				
_____ = Total Veg Cover																				
% Bare Ground in Herb Stratum _____																				
Remarks:																				

D5 - FAC Neutral Test for hydrology. Drop all FAC, cross examine all other dominants. If > 50% remaining are FACW to OBL, then YES to D5.

Appendix C

FACWet Version 3.0

April 2013

ADMINISTRATIVE CHARACTERIZATION

General Information		Date of Evaluation: 9/12/2013	
Site Name or ID: AA-1	Project Name: I-76 and Bridge Street EA		
404 or Other Permit Application #:	No 404. Likely covered under NWP 14	Applicant Name: Colorado Department of Transportation	
Evaluator Name(s):	Tim DeMasters	Evaluator's professional position and organization:	Biologist, Pinyon Environmental Inc.
Location Information:			
Site Coordinates (Decimal Degrees, e.g., 38.85, -104.96):	39.986913°, -104.735925°	Geographic Datum Used (NAD 83):	NAD 83
		Elevation	5,060 feet
Location Information:	Interstate 76 and Bridge Street Intersection Area.		
Associated stream/water body name:	none	Stream Order:	N/A
USGS Quadrangle Map:	Mile High Lakes	Map Scale: (Circle one)	<u>1:24,000</u> 1:100,000 Other 1:
Sub basin Name (8 digit HUC):	10190003	Wetland Ownership:	CDOT
Project Information:			
This evaluation is being performed at: <input checked="" type="checkbox"/> Project Wetland <input type="checkbox"/> Mitigation Site <i>(Check applicable box)</i>		Purpose of Evaluation (check all applicable):	<input checked="" type="checkbox"/> Potentially Impacted Wetlands <input type="checkbox"/> Mitigation; Pre-construction <input type="checkbox"/> Mitigation; Post-construction <input type="checkbox"/> Monitoring <input type="checkbox"/> Other (Describe)
Intent of Project: <i>(Check all applicable)</i> <input type="checkbox"/> Restoration <input type="checkbox"/> Enhancement <input type="checkbox"/> Creation			
Total Size of Wetland Involved: (Record Area, Check and Describe Measurement Method Used)	0.03 ac.	<input checked="" type="checkbox"/> Measured <input type="checkbox"/> Estimated	
Assessment Area (AA) Size (Record Area, check appropriate box. Additional spaces are used to record acreage when more than one AA is included in a single assessment)	0.03 ac.	<input checked="" type="checkbox"/> Measured	0.01 ac. 0.02 ac. ac. ac.
		<input type="checkbox"/> Estimated	ac. ac. ac. ac.
Characteristics or Method used for AA boundary determination:	The AA boundaries were determined based on the projected impacts to wetlands.		
Notes:	There are only two small wetlands in the study area. Impacts are anticipated at only one of the wetland areas. Hydrology and vegetation are similar at both wetlands. Therefore, a single AA was used for both areas.		

ECOLOGICAL DESCRIPTION 1

Special Concerns

Check all that apply

- | | |
|--|---|
| <input type="checkbox"/> Organic soils including Histosols or Histic Epipedons are present in the AA (i.e., AA includes core fen habitat).

<input type="checkbox"/> Project will directly impact organic soil portions of the AA including areas possessing either Histosol soils or histic epipedons.

<input type="checkbox"/> Organic soils are known to occur anywhere within the contiguous wetland of which the AA is part.

<input type="checkbox"/> The wetland is a habitat oasis in an otherwise dry or urbanized landscape?

<input type="checkbox"/> Federally threatened or endangered species are KNOWN to occur in the AA? List Below.

<hr/> | <input type="checkbox"/> Federally threatened or endangered species are SUSPECTED to possibly occur in the AA?

<hr/>
<hr/> <input type="checkbox"/> Species of concern according to the Colorado Natural Heritage (CNHP) are known to occur in the AA?

<input type="checkbox"/> Other special concerns (please describe)

<input type="checkbox"/> Other special concerns (please describe) |
|--|---|

HYDROGEOMORPHIC SETTING

- AA wetland maintains its fundamental natural hydrogeomorphic characteristics
- AA wetland has been subject to change in HGM classes as a result of anthropogenic modification
If the above is checked, please describe the original wetland type if discernable using the table below.
- AA wetland was created from an upland setting.

Current Conditions

Describe the hydrogeomorphic setting of the wetland by circling all conditions that apply.

HGM Setting	Water source	<u>Surface flow</u>	Groundwater	<u>Precipitation</u>	Unknown		
	Hydrodynamics	Unidirectional	Vertical	<u>Bi-directional</u>			
	Wetland Gradient	<u>0 - 2%</u>	2-4%	4-10%	>10%		
	# Surface Inlets	Over-bank	0	<u>1</u>	2	3	>3
	# Surface Outlets		0	<u>1</u>	2	3	>3
	Geomorphic Setting <small>(Narrative Description. Include approx. stream order for riverine)</small>						
	HGM class	Riverine	Slope	<u>Depressional</u>	Lacustrine		

Historical Conditions

Previous wetland typology	Water source	Surface flow	Groundwater	Precipitation	Unknown
	Hydrodynamics	Unidirectional	Vertical		
	Geomorphic Setting <small>(Narrative Description)</small>				
	Previous HGM Class	Riverine	Slope	Depressional	Lacustrine

Notes (include information on the AA's HGM subclass and regional subclass): NONE

Variable 1: Habitat Connectivity

The Habitat Connectivity Variable is described by two sub-variables – Neighboring Wetland and Riparian Habitat Loss and Barriers to Migration and Dispersal. These sub-variables were treated as independent variables in FACWet Version 2.0. The merging of these variables makes their structure more consistent with that of other composite variables in FACWet. The new variable configuration also makes this landscape variable more accurately reflect the interactions amongst aquatic habitats in Colorado's agricultural and urbanized landscapes, which have a naturally low density of wetlands. The two Habitat Connectivity Sub-variables are scored in exactly the same manner as their FACWet 2.0 counterparts, as described below. The Habitat Connectivity Variable score is simply the arithmetic average of the two sub-variable scores which is entered on the second page of the Variable 1 data form. If there is little or no wetland or riparian habitat in the Habitat Connectivity Envelope (defined below), then Sub-variable 1.1 is not scored.

SV 1.1 - Neighboring Wetland and Riparian Habitat Loss

(Do not score if few or no wetlands naturally exist in the HCE)

This sub-variable is a measure of how isolated from other naturally-occurring wetlands or riparian habitat the AA has become as the result of habitat destruction. To score this sub-variable, estimate the percent of naturally-occurring wetland/riparian habitat that has been lost (by filling, draining, development, or whatever means) within the 500-meter-wide belt surrounding the AA. This zone is called the Habitat Connectivity Envelope (HCE). In most cases the evaluator must use best professional judgment to estimate the amount of natural wetland loss. Historical photographs, National Wetland Inventory (NWI) maps, hydric soil maps can be helpful in making these determinations. Floodplain maps are especially valuable in river-dominated regions, such as the Front Range urban corridor. Evaluation of landforms and habitat patterns in the context of perceivable land use change is used to steer estimates of the amount of wetland loss within the HCE.

Rules for Scoring:

1. On the aerial photo, create a 500 m perimeter around the AA.
2. The area within this perimeter is the **Habitat Connectivity Envelope (HCE)**.
3. Within the HCE, outline the current extent of naturally occurring wetland and riparian habitat. Do not include habitats such as excavated ponds or reservoir induced fringe wetlands.
4. Outline the historical extent of wetland and riparian habitats (i.e., existing natural wetlands plus those that have been destroyed).
 - Use your knowledge of the history of the area and evident land use change to identify where habitat losses have occurred. Additional research can be utilized to increase the accuracy of this estimate including consideration of floodplain maps, historical aerial photographs, soil maps, etc.
5. Calculate the area of existing and historical wetlands. Divide the area of existing wetland by the total amount of existing and historical wetland and riparian habitat, and determine the variable score using the guidelines below. Enter sub-variable score at the bottom of p.2 of the Habitat Connectivity data form.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Wetland losses are absent or negligible or there is no evidence to suggest the native landscape within the HCE historically contained other wetland habitats
<0.9 - 0.8	B Highly Functioning	More than 80% of historical wetland habitat area within the HCE is still present (less than 20% of habitat area lost).
<0.8 - 0.7	C Functioning	80 to 60% of historical wetland habitat area within the HCE is still present (20% to 40% of habitat area lost).
<0.7 - 0.6	D Functioning Impaired	Less than 60 to 25% of historical wetland habitat area within the HCE is still present (more than 40 to 75% of habitat area lost).
<0.6	F Non-functioning	Less than 25% of the historical wetland habitat area within the HCE still in existence (more than 70% of habitat lost).

Notes: Few natural wetlands exist in HCE.

Variable 1: Habitat Connectivity p. 2

SV 1.2: Migration/Dispersal Barriers

This sub-variable is intended to rate the degree to which the AA has become isolated from existing neighboring wetland and riparian habitat by artificial barriers that inhibit migration or dispersal of organisms. On the aerial photograph, identify the man-made barriers within the HCE that intercede between the AA and surrounding wetlands and riparian areas, and identify them by type on the stressor list. Score this variable based on the barriers' impermeability to migration and dispersal and the amount of surrounding wetland/riparian habitat they affect.

Rules for Scoring:

1. On the aerial photo, outline **all** existing wetland and riparian habitat areas within the HCE. This includes naturally occurring habitats, as well as those purposefully created or induced by land use change.
2. Identify artificial barriers to dispersal and migration of organisms within the HCE that intercede between the AA and surrounding habitats. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
3. Considering the composite effect of all of identified barriers to migration and dispersal (i.e., stressors), assign an overall variable score using the scoring guidelines.

<input checked="" type="checkbox"/>	Stressors	Comments/description
x	Major Highway	I-76 runs through the project area.
x	Secondary Highway	Bridge Street intersectst with I-76 in the project area.
	Tertiary Roadway	
	Railroad	
	Bike Path	
x	Urban Development	Residential development to west, some commercial to east.
	Agricultural Development	
	Artificial Water Body	
	Fence	
	Ditch or Aqueduct	
	Aquatic Organism Barriers	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A <i>Reference Standard</i>	No appreciable barriers exist between the AA and other wetland and riparian habitats in the HCE; or there are no other wetland and riparian areas in the HCE.
<0.9 - 0.8	B <i>Highly Functioning</i>	Barriers impeding migration/dispersal between the AA and up to 33% of surrounding wetland/riparian habitat highly permeable and easily passed by most organisms. Examples could include gravel roads, minor levees, ditches or barbed-wire fences. More significant barriers (see "functioning category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.8 - 0.7	C <i>Functioning</i>	Barriers to migration and dispersal retard the ability of many organisms/propagules to pass between the AA and up to 66% of wetland/riparian habitat. Passage of organisms and propagules through such barriers is still possible, but it may be constrained to certain times of day, be slow, dangerous or require additional travel. Busy two-lane roads, culverted areas, small to medium artificial water bodies or small earthen dams would commonly rate a score in this range. More significant barriers (see "functioning impaired" category below) could affect migration to up to 10% of surrounding wetland/riparian habitat.
<0.7 - 0.6	D <i>Functioning Impaired</i>	Barriers to migration and dispersal preclude the passage of some types of organisms/propagules between the AA and up to 66% of surrounding wetland/riparian habitat. Travel of those animals which can potential negotiate the barrier are strongly restricted and may include a high chance of mortality. Up to 33% of surrounding wetland/riparian habitat could be functionally isolated from the AA.
<0.6	F <i>Non-functioning</i>	AA is essentially isolated from surrounding wetland/riparian habitat by impermeable migration and dispersal barriers. An interstate highway or concrete-lined water conveyance canal are examples of barriers which would generally create functional isolation between the AA and wetland/riparian habitat in the HCE.

SV 1.1 Score	0.65
SV 1.2 Score	0.65

Add SV 1.1 and 1.2 scores and divide by two to calculate variable score

Variable 1 Score

0.65

Variable 2: Contributing Area

The AA's Contributing Area is defined as the 250-meter-wide zone surrounding the perimeter of the AA. This variable is a measure of the capacity of that area to support characteristic functions of high quality wetland habitat. Depending on its condition, the contributing area can help maintain wetland condition or it can degrade it. Contributing Area condition is evaluated by considering the AA's Buffer and its Surrounding Land Use. Buffers are strips or patches of more-or-less natural upland and/or wetland habitat more than 5m wide. Buffers are contiguous with the AA boundary and they intercede between it and more intensively used lands. The AA Buffer is characterized with three sub-variables: Buffer Condition, Buffer Extent, and Average Buffer Width. The Surrounding Land Use Sub-variable considers changes within the Contributing Area that limit its capacity to support characteristic wetland functions. Many of the acute, on-site effects of land use change in the Contributing Area are specifically captured by Variables 3 - 8.

Rules for Scoring:

1. Delimit the Contributing Area on an aerial photograph as the zone within 250 meters of the outer boundary of the AA.
2. Evaluate and then rate the Buffer Condition sub-variable using the scoring guidelines. Record the score in the cell provided on the datasheet.
3. Indicate on the aerial photograph zones surrounding the AA which have 5m of buffer vegetation and those which do not.
4. Calculate the percentage of the AA which has a Buffer and record the value where indicated on the data sheet.
5. Rate the *Buffer Extent* Sub-variable using the scoring guidelines.
6. Determine the average Buffer width by drawing a line perpendicularly from the AA boundary to the outer extent of the buffer habitat. Measure line length and record its value on the data sheet. Repeat this process until a total of 8 lines have been sampled.
7. Calculate the average buffer width and record value on the data form. Then determine the sub-variable score using the scoring guidelines.
8. Score the Surrounding Land Use sub-variable by recording land use changes on the stressor list that affect the capacity of the landscape to support characteristic wetland functioning.
9. Enter the **lowest** of the three Buffer sub-variable scores along with the Surrounding Land Use Sub-variable score in the Contributing Area Variable scoring formula at the bottom of p. 2 of the data form. The Contributing Area Variable is the average of the two sub-variable scores.

SV 2.1 - Buffer Condition

0.7 **SV 2.1 - Buffer Condition Score**

Subvariable Score	Condition Grade	Buffer Condition Scoring Guidelines
1.0 - 0.9	<i>Reference Standard</i>	Buffer vegetation is predominately native vegetation, human-caused disturbance of the substrate is not evident, and human visitation is minimal. Common examples: Wilderness areas, undeveloped forest and range lands.
<0.9 - 0.8	<i>Highly Functioning</i>	Buffer vegetation may have a mixed native-nonnative composition, but characteristic structure and complexity remain. Soils are mostly undisturbed or have recovered from past human disturbance. Little or only low-impact human visitation. Buffers with higher levels of substrate disturbance may be included here if the buffer is still able to maintain predominately native vegetation. Common examples: Dispersed camping areas in national forests, common in wildland parks (e.g. State Parks) and open spaces.
<0.8 - 0.7	<i>Functioning</i>	Buffer vegetation is substantially composed of non-native species. Vegetation structure may be somewhat altered, such as by brush clearing. Moderate substrate disturbance and compaction occurs, and small pockets of greater disturbance may exist. Common examples: City natural areas, mountain hay meadows.
<0.7 - 0.6	<i>Functioning Impaired</i>	Buffer vegetation is substantially composed of non-native species and vegetation structure has been strongly altered by the complete removal of one or more strata. Soil disturbance and the intensity of human visitation are generally high. Common examples: Open lands around resource extraction sites (e.g., gravel mines), clear cut logging areas, ski slopes.
<0.6	<i>Non-functioning</i>	Buffer is nearly or entirely absent.

SV 2.2 - Buffer Extent

15 Percent of AA with Buffer

0.65 **SV 2.2 - Buffer Extent**

Subvariable Score	Condition Class	% Buffer Scoring Guidelines
1.0 - 0.9	<i>Reference Standard</i>	90 - 100% of AA with Buffer
<0.9 - 0.8	<i>Highly Functioning</i>	70-90% of AA with Buffer
<0.8 - 0.7	<i>Functioning</i>	51-69% of AA with Buffer
<0.7 - 0.6	<i>Functioning Impaired</i>	26-50% of AA with Buffer
<0.6	<i>Non-functioning</i>	0-25% of AA with Buffer

Variable 2: Contributing Area (p. 2)

SV 2.3 - Average Buffer Width

Record measured buffer widths in the spaces below and average.

Buffer Width (m)	10	5	5	5	0	0	0	0	3
Line #	1	2	3	4	5	6	7	8	Avg. Buffer Width (m)

0.6 SV 2.3 - Average Buffer Width Score

Subvariable Score	Condition Grade	Buffer Width Scoring Guidelines
1.0 - 0.9	Reference Standard	Average Buffer width is 190-250m
<0.9 - 0.8	Highly Functioning	Average Buffer width is 101-189m
<0.8 - 0.7	Functioning	Average Buffer width is 31-100m
<0.7 - 0.6	Functioning Impaired	Average Buffer width is 6-30m
<0.6	Non-functioning	Average Buffer width is 0-5m

SV 2.4 - Surrounding Land Use

0.65 SV 2.4 - Surrounding Land Use Score

Catalog and characterize land use changes in the surrounding landscape and score.

Stressors = Land Use Changes	<input checked="" type="checkbox"/>	Stressors	Comments/description	
	<input type="checkbox"/>	x	Industrial/commercial	
	<input type="checkbox"/>		Urban	
	<input type="checkbox"/>	x	Residential	Residential development to west, some commercial to east.
	<input type="checkbox"/>	x	Rural	Some rural areas exist
	<input type="checkbox"/>		Dryland Farming	
	<input type="checkbox"/>		Intensive Agriculture	
	<input type="checkbox"/>		Orchards or Nurseries	
	<input type="checkbox"/>		Livestock Grazing	
	<input type="checkbox"/>	x	Transportation Corridor	I-76, Bridge St, and Frontage Road
	<input type="checkbox"/>		Urban Parklands	
	<input type="checkbox"/>		Dams/impoundments	
	<input type="checkbox"/>		Artificial Water body	
	<input type="checkbox"/>		Physical Resource Extraction	
	<input type="checkbox"/>		Biological Resource Extraction	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	No appreciable land use change has been imposed Surrounding Landscape.
<0.9 - 0.8	B Highly Functioning	Some land use change has occurred in the Surrounding Landscape, but changes have minimal effect on the the landscape's capacity to support characteristic aquatic functioning, either because land use is not intensive, for example haying, light grazing, or low intensity silviculture, or more substantial changes occur in approximately less than 10% of the area.
<0.8 - 0.7	C Functioning	Surrounding Landscape has been subjected to a marked shift in land use, however, the land retains much of its capacity to support natural wetland function and it is not an overt source of pollutants or sediment. Moderate-intensity land uses such as dry-land farming, urban "green" corridors, or moderate cattle grazing would commonly be placed within this scoring range.
<0.7 - 0.6	D Functioning Impaired	Land use changes within the Surrounding Landscape has been substantial including the a moderate to high coverage (up to 50%) of impermeable surfaces, bare soil, or other artificial surfaces; considerable in-flow urban runoff or fertilizer-rich waters common. Supportive capacity of the land has been greatly diminished but not totally extinguished. Intensively logged areas, low-density urban developments, some urban parklands and many cropping situations would commonly rate a score within this range.
<0.6	F Non-functioning	The Surrounding Landscape is essentially completely developed or is otherwise a cause of severe ecological stress on wetland habitats. Commercial developments or highly urban landscapes generally rate a score of less than 0.6.

Buffer Score
(Lowest score)

Surrounding
Land Use

$$\left(\boxed{0.6} + \boxed{0.65} \right) \div 2 = \text{Variable 2 Score} \quad \boxed{0.63}$$

Variable 3: Water Source

This variable is concerned with **up-gradient** hydrologic connectivity. It is a measure of impacts to the AA's water source, including the quantity and timing of water delivery, and the ability of source water to perform work such as sediment transport, erosion, soil pore flushing, etc. To score this variable, identify stressors that alter the source of water to the AA, and record their presence on the stressor list. Stressors can impact water source by depletion, augmentation, or alteration of inflow timing or hydrodynamics. This variable is designed to assess water quantity, power and timing, not water quality. Water quality will be evaluated in Variable 7.

Scoring rules:

1. Use the stressor list and knowledge of the watershed to catalog type-specific impairments of the AA's water source. Mark the stressors present with a check in the first column and describe the general nature, severity and extent of each. List additional stressors in empty rows at the bottom of the table and explain.
2. Considering the composite effect of stressors on the water source, rate the condition of this variable with the aid of the scoring guidelines.

✓	Stressors	Comments/description
	Ditches or Drains (tile, etc.)	
	Dams	
	Diversions	
	Groundwater pumping	
	Draw-downs	
×	Culverts or Constrictions	Both AA s are sourced by culverts.
	Point Source (urban, ind., ag.)	
	Non-point Source	
	Increased Drainage Area	
	Storm Drain/Urban Runoff	
×	Impermeable Surface Runoff	I-76, Bridge Street, and Frontage Road
	Irrigation Return Flows	
	Mining/Natural Gas Extraction	
	Transbasin Diversion	
	Actively Managed Hydrology	

Variable Score	Condition Grade	Depletion	Augmentation
1.0 - 0.9	A <i>Reference Standard</i>	Unnatural drawdown events minor, rare or non-existent, very slight uniform depletion, or trivial alteration of hydrodynamics.	Unnatural high-water events minor, rare or non-existent, slight uniform increase in amount of inflow, or trivial alteration of hydrodynamics.
<0.9 - 0.8	B <i>Highly Functioning</i>	Unnatural drawdown events occasional, short duration and/or mild; or uniform depletion up to 20%; or mild to moderate reduction of peak flows or capacity of water to perform work.	Occasional unnatural high-water events, short in duration and/or mild in intensity; or uniform augmentation up to 20%; or mild to moderate increase of peak flows or capacity of water to perform work.
<0.8 - 0.7	C <i>Functioning</i>	Unnatural drawdown events common and of mild to moderate intensity and/or duration; or uniform depletion up to 50%; or moderate to substantial reduction of peak flows or capacity of water to perform work.	Common occurrence of unnatural high-water events, of a mild to moderate intensity and/or duration; or uniform augmentation up to 50%; or moderate to substantial increase of peak flows or capacity of water to perform work.
<0.7 - 0.6	D <i>Functioning Impaired</i>	Unnatural drawdown events occur frequently with a moderate to high intensity and/or duration; or uniform depletion up to 75%; or substantial reduction of peak flows or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.	Common occurrence of unnatural high-water events, some of which may be severe in nature or exist for a substantial portion of the growing season; or uniform augmentation more than 50% or capacity of water to perform work. Wetlands with actively managed or wholly artificial hydrology will usually score in this range or lower.
<0.6	F <i>Non-functioning</i>	Water source diminished enough to threaten or extinguish wetland hydrology in the AA.	Frequency, duration or magnitude of unnaturally high-water great enough to change the fundamental characteristics of the wetland.

Variable 3 Score

0.6

Variable 4: Water Distribution

This variable is concerned with hydrologic connectivity *within* the AA. It is a measure of alteration to the spatial distribution of surface and groundwater within the AA. These alterations are manifested as local changes to the hydrograph and generally result from geomorphic modifications within the AA. To score this variable, identify stressors within the AA that alter flow patterns and impact the hydrograph of the AA, including localized increases or decreases to the depth or duration of the water table or surface water.

Because the wetland's ability to distribute water in a characteristic fashion is fundamentally dependent on the condition of its water source, **in most cases the Water Source variable score will define the upper limit Water Distribution score**. For example, if the Water Source variable is rated at 0.85, the Water Distribution score will usually have the potential to attain a maximum score of 0.85. Additional stressors within or outside the lower end of the AA effecting water distribution (e.g., ditches and levees) will reduce the score from the maximum value.

Scoring rules:

1. Identify impacts to the natural distribution of water throughout the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. In most cases, the Water Source variable score will set the upper limit for the Water Distribution score.

✓	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Ponding/Impoundment	
	Culverts	
	Road Grades	
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Enlarged Channel	
	Artificial Banks/Shoreline	
	Weirs	
	Dikes/Levees/Berms	
	Diversions	
×	Sediment/Fill Accumulation	Both wetlands show signs of sediment accumulation

Variable Score	Condition Grade	Non-riverine	Riverine
1.0 - 0.9	A <i>Reference Standard</i>	Little or no alteration has been made to the way in which water is distributed throughout the wetland. AA maintains a natural hydrologic regime.	Natural active floodplain areas flood on a normal recurrence interval. No evidence of alteration of flooding and subirrigation duration and intensity.
<0.9 - 0.8	B <i>Highly Functioning</i>	Less than 10% of the AA is affected by <i>in situ</i> hydrologic alteration; or more widespread impacts result in less than a 2 in. (5 cm) change in mean growing season water table elevation.	Channel-adjacent areas have occasional unnatural periods of drying or flooding; or uniform shift in the hydrograph less than typical root depth.
<0.8 - 0.7	C <i>Functioning</i>	Between 10 and 33% of the AA is affected by <i>in situ</i> hydrologic alteration; or more widespread impacts result in a 4 in. (5 cm) or less change in mean growing season water table elevation.	In channel-adjacent area, periods of drying or flooding are common; or uniform shift in the hydrograph near root depth.
<0.7 - 0.6	D <i>Functioning Impaired</i>	33 to 66% of the AA is affected by <i>in situ</i> hydrologic alteration; or more widespread impacts result in a 6 in. (15 cm) or less change in mean growing season water table elevation. Water table behavior must still meet jurisdictional criteria to merit this rating.	Adjacent to the channel, unnatural periods of drying or flooding are the norm; or uniform shift in the hydrograph greater than root depth.
<0.6	F <i>Non-functioning</i>	More than 66% of the AA is affected by hydrologic alteration which changes the fundamental functioning of the wetland system, generally exhibited as a conversion to upland or deep water habitat.	Historical active floodplain areas are almost never wetted from overbank flooding, and/or groundwater infiltration is effectively cut off.

Variable 4 Score

0.7

Variable 5: Water Outflow

This variable is concerned with **down-gradient** hydrologic connectivity and the flow of water and water-borne materials and energy out of the AA. In particular it illustrates the degree to which the AA can support the functioning of down-gradient habitats. It is a measure of impacts that affect the hydrologic outflow of water including the passage of water through its normal low- and high-flow surface outlets, infiltration/groundwater recharge, and the energetic characteristics of water delivered to dependent habitats. In some cases, alteration of evapotranspiration rates may be significant enough of a factor to consider in scoring. Score this variable by identifying stressors that impact the means by which water is exported from the AA. To evaluate this variable focus on how water, energy and associated materials are exported out of the AA and their ability to support down-gradient habitats in a manner consistent with their HGM (regional) subclass.

Because the wetland's ability to export water and materials in a characteristic fashion is to a very large degree dependent the condition of its water source, as with the Water Distribution variable, **in most cases the Water Source variable score will define the upper limit Water Outflow score.**

Scoring rules:

1. Identify impacts to the natural outflow of water from the AA and catalog them in the stressor table.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines. Take in to account the cumulative effect of stressors on the wetland's ability to export water and water-borne materials. In most cases the Water Source variable will set the upper limit for the Water Outflow score.

✓	Stressors	Comments/description
	Alteration of Water Source	
	Ditches	
	Dikes/Levees	
×	Road Grades	Wetland 1 is affected more by road grades.
	Culverts	
	Diversions	
×	Constrictions	Both wetlands are constricted
	Channel Incision/Entrenchment	
	Hardened/Engineered Channel	
	Artificial Stream Banks	
	Weirs	
	Confined Bridge Openings	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Stressors have little to no effect on the magnitude, timing or hydrodynamics of the AA water outflow regime.
<0.9 - 0.8	B Highly Functioning	High- or low-water outflows are mildly to moderately affected, but at intermediate ("normal") levels flow continues essentially unaltered in quantity or character.
<0.8 - 0.7	C Functioning	High- or low-water outflows are moderately affected, mild alteration of intermediate level outflow occurs; or hydrodynamics moderately affected.
<0.7 - 0.6	D Functioning Impaired	Outflow at all stages is moderately to highly impaired resulting in persistent flooding of portions of the AA or unnatural drainage; or outflow hydrodynamics severely disrupted.
<0.6	F Non-functioning	The natural outflow regime is profoundly impaired. Down-gradient hydrologic connection severed or nearly so. Alterations may cause widespread unnatural persistent flooding or dewatering of the wetland system.

Variable 5 Score

0.7

Variable 6: Geomorphology

This variable is a measure of the degree to which the geomorphic setting has been altered within the AA. Changes to the surface configuration and natural topography constitute stressors. Such stressors may be observed in the form of fill, excavation, dikes, sedimentation due to absence of flushing floods, etc. In riverine systems, geomorphic changes to the stream channel should be considered if the channel is within the AA (i.e., small is size). Alterations may involve the bed and bank (substrate embeddedness or morphological changes), stream instability, and stream channel reconfiguration. Geomorphic changes are usually ultimately manifested as changes to wetland surface hydrology and water relations with vegetation. Geomorphic alterations can also directly affect soil properties, such as near-surface texture, and the wetland chemical environment such as the redox state or nutrient composition in the rooting zone. In rating this variable, **do not** include these resultant effects of geomorphic change; rather focus on the physical impacts **within the footprint** of the alteration **within the AA** – For example, the width and depth of a ditch or the size of a levee **within the AA** would describe the extent of the stressors. The secondary effects of geomorphic change are addressed by other variables. All alterations to geomorphology should be evaluated including small-scale impacts such as pugging, hoof shear, and sedimentation which can be significant but not immediately obvious.

Scoring Rules:

1. Identify impacts to geomorphological setting and topography within the AA and record them on the stressor checklist.
2. Considering all of the stressors identified, assign an overall variable score using the scoring guidelines.

✓	Stressors	Comments
	Dredging/Excavation/Mining	
	Fill, including dikes, road grades, etc.	
	Grading	
	Compaction	
	Plowing/Disking	
×	Excessive Sedimentation	Both Wetlands 1 and 2 show signs of heavy sediment accumulation
	Dumping	
	Hoof Shear/Pugging	
	Aggregate or Mineral Mining	
	Sand Accumulation	
	Channel Instability/Over Widening	
	Excessive Bank Erosion	
	Channelization	
	Reconfigured Stream Channels	
	Artificial Banks/Shoreline	
	Beaver Dam Removal	
	Substrate Embeddedness	
	Lack or Excess of Woody Debris	

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A Reference Standard	Topography essentially unaltered from the natural state, or alterations appear to have a minimal effect on wetland functioning and condition. Patch or microtopographic complexity may be slightly altered, but native plant communities are still supported.
<0.9 - 0.8	B Highly Functioning	Alterations to topography result in small but detectable changes to habitat conditions in some or all of the AA; or more severe impacts exist but affect less than 10% of the AA.
<0.8 - 0.7	C Functioning	Changes to AA topography may be pervasive but generally mild to moderate in severity. May include patches of more significant habitat alteration; or more severe alterations affect up to 20 % of the AA.
<0.7 - 0.6	D Functioning Impaired	At least one important surface type or landform has been eliminated or created; microtopography has been strongly impacted throughout most or all of the AA; or more severe alterations affect up to 50% of the AA. Evidence that widespread diminishment or alteration of native plant community exist due to physical habitat alterations. Most incidentally created wetland habitat such as that created by roadside ditches and the like would score in this range or lower.
<0.6	F Non-functioning	Pervasive geomorphic alterations have caused a fundamental change in site character and functioning, commonly resulting in a conversion to upland or deepwater habitat.

**Variable 6
Score**

0.75

Variable 7: Water and Soil Chemical Environment

This variable concerns the chemical environment of the soil and water media within the AA, including pollutants, water and soil characteristics. The origin of pollutants may be within or outside the AA. Score this variable by listing indicators of chemical stress in the AA. Consider point source and non-point sources of pollution, as well as mechanical or hydrologic changes that alter the chemical environment. Because water quality frequently cannot be inferred directly, the presence of stressors is often identified by the presence of indirect indicators. Five sub-variables are used to describe the Water and Soil Chemical Environment: Nutrient Enrichment/Eutrophication/Oxygen; Sedimentation/Turbidity; Toxic Contamination/pH; Temperature; and Soil Chemistry and Redox Potential. Utilization of web-based data mining tools is highly recommended to help inform and support variable scores.

Scoring rules:

1. Stressors are grouped into sub-variables which have a similar signature or set of causes.
2. Use the indicator list to identify each stressor impacting the chemical environment of the AA.
3. For each sub-variable, determine its score using the scoring guideline table provided on the second page of the scoring sheet. Scoring sub-variables is carried out in exactly the same way as normal variable scoring.
-If the AA is part of a water body that is recognized as impaired or recommended for TMDL development for one of the factors, then score that sub-variable 0.65 or lower.
4. Transcribe sub-variable scores to the following variable scoring page and compute the sum.
5. The lowest sub-variable score sets the letter grade range. The composite of sub-variables influences the score within that range.

Sub-variable	Stressor Indicator	✓	Comments	Sub-variable Score
SV 7.1 Nutrient Enrichment/ Eutrophication/ Oxygen (D.O.)	Livestock			0.80
	Agricultural Runoff			
	Septic/Sewage			
	Excessive Algae or Aquatic Veg.			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.2 Sedimentation/ Turbidity	Excessive Erosion	X		0.70
	Excessive Deposition	X		
	Fine Sediment Plumes			
	Agricultural Runoff			
	Excessive Turbidity			
	Nearby Construction Site			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.3 Toxic contamination/ pH	Recent Chemical Spills			0.70
	Nearby Industrial Sites	X	Commercial sites nearby	
	Road Drainage/Runoff			
	Livestock			
	Agricultural Runoff			
	Storm Water Runoff	X	Storm water runoff	
	Fish/Wildlife Impacts			
	Vegetation Impacts			
	Cumulative Watershed NPS			
	Acid Mine Drainage			
	Point Source Discharge			
	CDPHE Impairment/TMDL List			
	Metal staining on rocks and veg.			
SV 7.4 Temperature	Excessive Temperature Regime	X	No overstory at either AA	0.65
	Lack of Shading	X	No overstory at either AA	
	Reservoir/Power Plant Discharge			
	Industrial Discharge			
	Cumulative Watershed NPS			
	CDPHE Impairment/TMDL List			
SV 7.5 Soil chemistry/ Redox potential	Unnatural Saturation/Desaturation	X	Both likely subject to fluctuations	0.65
	Mechanical Soil Disturbance			
	Dumping/introduced Soil			
	CDPHE Impairment/TMDL List			

Variable 7: Water and Soil Chemical Environment p.2

Sub-variable Scoring Guidelines

Variable Score	Condition Class	Scoring Guidelines
1.0 - 0.9	A <i>Reference Standard</i>	Stress indicators not present or trivial.
<0.9 - 0.8	B <i>Highly Functioning</i>	Stress indicators scarcely present and mild, or otherwise not occurring in more than 10% of the AA.
<0.8 - 0.7	C <i>Functioning</i>	Stress indicators present at mild to moderate levels, or otherwise not occurring in more than 33% of the AA.
<0.7 - 0.6	D <i>Functioning Impaired</i>	Stress indicators present at moderate to high levels, or otherwise not occurring in more than 66% of the AA
<0.6	F <i>Non-functioning</i>	Stress indicators strongly evident throughout the AA at levels which apparently alter the fundamental chemical environment of the wetland system

Input each sub-variable score from p. 1 of the V7 data form and calculate the sum.

Nutrient enrichment/ Eutrophication/ Oxygen (D.O.)		Sedimentation/ Turbidity		Toxic contamination/ pH		Temperature		Soil chemistry/ Redox potential		Sum of Sub-variable Scores
0.80	+	0.70	+	0.70	+	0.65	+	0.65	=	3.50

Use the table to score the Chemical Environment Variable circling the applicable scoring rules.

Variable Score	Condition Grade	Scoring Rules	
		Single Factor	Composite Score
1.0 - 0.9	A <i>Reference Standard</i>	No single factor scores < 0.9	The factor scores sum > 4.5
<0.9 - 0.8	B <i>Highly Functioning</i>	Any single factor scores ≥ 0.8 but < 0.9	The factor scores sum >4.0 but ≤4.5
<0.8 - 0.7	C <i>Functioning</i>	Any single factor scores ≥ 0.7 but < 0.8	The factor scores sum >3.5 but ≤ 4.0
<0.7 - 0.6	D <i>Functioning Impaired</i>	Any single factor scores ≥ 0.6 but <0.7	The factor scores sum >3.0 but ≤3.5
< 0.6	F <i>Non-functioning</i>	Any single factor scores < 0.6	The factor scores sum < 3.0

Variable 7 Score

0.65

Variable 8: Vegetation Structure and Complexity

This variable is a measure of the condition of the wetland's vegetation relative to its native state. It particularly focuses on the wetland's ability to perform higher-order functions such as support of wildlife populations, and influence primary functions such as flood-flow attenuation, channel stabilization and sediment retention. Score this variable by listing stressors that have affected the structure, diversity, composition and cover of each vegetation stratum that would normally be present in the HGM (regional) subclass being assessed. For this variable, stressor severity is a measure of how much each vegetation stratum differs functionally from its natural condition or from the natural range of variability exhibited the HGM subclass or regional subclass. This variable has four sub-variables, each corresponding to a stratum of vegetation: Tree Canopy; Shrub Layer; Herbaceous Layer; and Aquatics.

Rules for Scoring:

1. Determine the number and types of vegetation layers present within the AA. Make a judgment as to whether additional layers were historically present using direct evidence such as stumps, root wads or historical photographs. Indirect evidence such as local knowledge and expert opinion can also be used in this determination.
2. Do not score vegetation layers that would not normally be present in the wetland type being assessed.
3. Estimate and record the current coverage of each vegetation layer at the top of the table.
4. Record the Reference Standard or expected percent coverage of each vegetation layer to create the sub-variable weigh factor. The condition of predominant vegetation layers has a greater influence on the variable score than do minor components.
5. Enter the percent cover values as decimals in the row of the stressor table labeled "Reference/expected Percent Cover of Layer". Note, percentages will often sum to more than 100% (1.0).
6. Determine the severity of stressors acting on each individual canopy layers, indicating their presence with checks in the appropriate boxes of the stressor table. The difference between the expected and observed stratum coverages is one measure of stratum alteration.
7. Determine the sub-variable score for each valid vegetation layer using the scoring guidelines on the second page of the scoring sheet. Enter each sub-variable score in the appropriate cell of the row labeled "Veg. Layer Sub-variable Score". If a stratum has been wholly removed score it as 0.5.
8. Multiply each layer's *Reference Percent Cover of Layer* score by its *Veg. Layer Sub-variable* scores and enter the products in the labeled cells. These are the weighted sub-variable scores. Individually sum the *Reference Percent Cover of Layer* and *Weighted Sub-variables* scores.
9. Divide the sum of "Veg. Layer Sub-variable Scores" by the total coverage of all layers scored. This product is the Variable 8 score. Enter this number in the labeled box at the bottom of this page.

Current % Coverage of Layer	Vegetation Layers				Comments
	0	0	100	0	
Stressor	Tree	Shrub	Herb	Aquatic	
Brush Cutting/Shrub Removal	X	X			
Dewatering					
Excessive Herbivory					
Exotic/Invasive spp.					
Herbicide					
Livestock Grazing					
Loss of Zonation/Homogenization					
Mowing/Haying	X	X	X		
Noxious Weeds	X				Weeds present at Wetland 2
Over Saturation					
Tree Harvest					
DIFFERENCE BETWEEN CURRENT COVERAGE AND REFERENCE/EXPECTED					

Reference/Expected % Cover of Layer	15	+	10	+	100	+	0	=	125
	X		X		X		X		
Veg. Layer Sub-variable Score	0.65		0.65		0.65		0.65		
Weighted Sub-variable Score	9.75	+	6.50	+	65.00	+	0.00	=	81.25

See sub-variable scoring guidelines on following page

Variable 8 Score

0.65

Variable 8: Vegetation Structure and Complexity p. 2

Sub-variable 8 Scoring Guidelines:

Based on the list of stressors identified above, rate the severity of their cumulative effect on vegetation structure and complexity for each vegetation layer.

Variable Score	Condition Grade	Scoring Guidelines
1.0 - 0.9	A <i>Reference Standard</i>	Stressors not present or with an intensity low enough as to not detectably affect the structure, diversity or composition of the vegetation layer.
<0.9 - 0.8	B <i>Highly Functioning</i>	Stressors present at intensity levels sufficient to cause detectable, but minor, changes in layer composition. Stress related change should generally be less than 10% for any given attribute (e.g., 10% cover of invasive, 10% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as high as 33% for a given attribute if stressors are confined to patches comprising less than 10% of the wetland.
<0.8 - 0.7	C <i>Functioning</i>	Stressors present with enough intensity to cause significant changes in the character of vegetation, including alteration of layer coverage, structural complexity and species composition. The vegetation layer retains its essential character though. AA's with a high proportion of non-native grasses will commonly fall in this class. Stress related change should generally be less than 33% for any given attribute (e.g., 33% cover of invasive, 33% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 66% for a given attribute if stressors are confined to patches comprising less than 25% of the wetland.
<0.7 - 0.6	D <i>Functioning Impaired</i>	Stressor intensity severe enough to cause profound changes to the fundamental character of the vegetation layer. Stress-related change should generally be less than 66% for any given attribute (e.g., 66% cover of invasive, 66% reduction in richness or cover) if the stressor is evenly distributed throughout the wetland. Stress related change could be as much as 80% of a given attribute if stressors are confined to patches comprising less than 50% of the wetland.
<0.6	F <i>Non-functioning</i>	Vegetation layer has been completely removed or altered to the extent that is no longer comparable to the natural structure, diversity and composition.

FACWet Score Card

Scoring Procedure:

1. Transcribe variable scores from each variable data sheet to the corresponding cell in the variable score table.
2. In each Functional Capacity Index (FCI) equation, enter the corresponding variable scores in the equation cells. Do not enter values in the crossed cells lacking labels.
3. Add the variable scores to calculate the total functional points achieved for each function.
4. Divide the total functional points achieved by the functional points possible. The typical number of total points possible is provided, however, if a variable is added or subtracted to FCI equation the total possible points must be adjusted.
5. Calculate the Composite FCI, by adding the FCI scores and dividing by the total number of functions scored (usually 7).
6. If scoring is done directly in the Excel spreadsheet, all values will be transferred and calculated automatically.

VARIABLE SCORE TABLE

Buffer & Landscape Context	Variable 1:	Habitat Connectivity (Connect)	0.65
	Variable 2:	Contributing Area (CA)	0.63
Hydrology	Variable 3:	Water Source (Source)	0.60
	Variable 4:	Water Distribution (Dist)	0.70
	Variable 5:	Water Outflow (Outflow)	0.70
Abiotic and Biotic Habitat	Variable 6:	Geomorphology (Geom)	0.75
	Variable 7:	Chemical Environment (Chem)	0.65
	Variable 8:	Vegetation Structure and Complexity (Veg)	0.65

Functional Capacity Indices

Function 1 -- Support of Characteristic Wildlife Habitat						Total Functional Points	FCI
$V1_{connect}$	$+ V2_{CA}$	$+ (2 \times V8_{veg})$		$=$	$\div 4 =$		
0.65	0.63	1.30		2.58		0.64	
Function 2 -- Support of Characteristic Fish/aquatic Habitat							
$(3 \times V3_{source})$	$+ (2 \times V4_{dist})$	$+ (2 \times V5_{outflow})$	$+ V6_{geom}$	$+ V7_{chem}$	$=$	$\div 9 =$	
1.80	1.40	1.40	0.75	0.65	6.00	0.67	
Function 3 -- Flood Attenuation							
$V2_{CA}$	$+ (2 \times V3_{source})$	$+ (2 \times V4_{dist})$	$+ (2 \times V5_{outflow})$	$+ V6_{geom}$	$+ V8_{veg}$	$=$	$\div 9 =$
0.63	1.20	1.40	1.40	0.75	6.03	0.67	
Function 4 -- Short- and Long-term Water Storage							
$V3_{source}$	$+ (2 \times V4_{dist})$	$+ (2 \times V5_{outflow})$	$+ V6_{geom}$		$=$	$\div 6 =$	
0.60	1.40	1.40	0.75		4.15	0.69	
Function 5 -- Nutrient/Toxicant Removal							
$(2 \times V2_{CA})$	$+ (2 \times V4_{dist})$	$+ V6_{geom}$	$+ V7_{chem}$		$=$	$\div 6 =$	
1.25	1.40	0.75	0.65		4.05	0.68	
Function 6 -- Sediment Retention/Shoreline Stabilization							
$V2_{CA}$	$+ (2 \times V6_{geom})$	$+ (2 \times V8_{veg})$			$=$	$\div 5 =$	
0.63	1.50	1.30			3.43	0.69	
Function 7 -- Production Export/Food Chain Support							
$V1_{connect}$	$+ (2 \times V5_{outflow})$	$+ V6_{geom}$	$+ V7_{chem}$	$+ (2 \times V8_{veg})$	$=$	$\div 7 =$	
0.65	1.40	0.75	0.65	1.30	4.75	0.68	

Sum of Individual FCI Scores **4.71**

Divide by the Number of Functions Scored $\div 7$

Composite FCI Score 0.67

the 1990s, the number of people with a mental health problem has increased in the UK, and the number of people with a mental health problem who are in contact with mental health services has also increased (Mental Health Act 1983, 1990, 1994, 1997, 2003, 2007, 2012).

There is a growing awareness of the need to improve the lives of people with a mental health problem, and to reduce the stigma and discrimination that they experience. This has led to a number of initiatives, including the development of mental health care plans, and the introduction of the Mental Health Act 2003, which introduced a new system of mental health care plans.

Mental health care plans are a key part of the mental health care system, and they provide a framework for the care of people with a mental health problem. They are developed in partnership with the person with a mental health problem, and they set out the goals of care, the services that will be provided, and the people who will be involved in the care.

The Mental Health Act 2003 introduced a new system of mental health care plans, and it required that all people with a mental health problem who are in contact with mental health services should have a mental health care plan. This was a significant change, and it reflected the growing awareness of the need to improve the lives of people with a mental health problem.

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**Modified Phase I
Environmental Site
Assessment**

Technical Report

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List of acronyms and abbreviations

ACM	Asbestos-containing material
bgs	Below ground surface
Brighton	City of Brighton
CDOT	Colorado Department of Transportation
CFR	Code of Federal Regulations
EA	Environmental Assessment
FHWA	Federal Highway Administration
MESA	Modified Environmental Site Assessment
NEPA	National Environmental Policy Act
REC	Recognized Environmental Condition
USGS	United States Geological Survey

1. Introduction and Scope of Work

The I-76 and Bridge Street Interchange Environmental Assessment (EA) is a joint effort between the City of Brighton (Brighton), the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT). This EA will identify potential impacts of the proposed interchange on the built and natural environment.

1.1 Site Location (see also Section 2.0)

Site: Includes the Bridge Street bridge over I-76 and portions of East Frontage Road and West Frontage Road near the Bridge Street intersection (as described in Section 2.0).
Address: Bridge Street and Interstate 76
City: Brighton
County: Adams
State: Colorado

1.2 Purpose and Scope of Services

The purpose of this assessment is to perform an evaluation for the potential presence of hazardous or toxic materials (otherwise known as “Recognized Environmental Conditions” [RECs])¹ at the Site. This report is made pursuant to all appropriate inquiry into the prior ownership and uses of the Site, consistent with good commercial and customary practices.

This Modified Phase I Environmental Site Assessment (MESA) generally meets the requirements of the ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (E 1527-05), with the deviations noted in Section 7.1, and the CDOT Modified Environmental Site Assessment (MESA) Guidance. The report was formatted for reading ease and does not follow the suggested ASTM format.

The scope of services for the project included the following:

1.2.1 Records Review

- An evaluation of historical Site use, by reviewing the following sources:
 - Aerial photographs reasonably available from public sources
 - Historical United States Geological Survey (USGS) topographic maps
 - City directories
 - Assessor information
- A review of the compliance history of the Site, and of any adjacent sites, as identified by the vendor-supplied regulatory database survey (EDR, 2013)
- A review of information regarding the physical settings of the Site, including:
 - The current USGS 7.5-minute topographic map
 - Geology and groundwater information published by the USGS
 - Soil survey, published in the Environmental Data Resources, Inc., report.

¹ Recognized environmental conditions (RECs) are defined by ASTM as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate environmental agencies.

1.2.2 Site Reconnaissance

Reconnaissance surveys of the Site and surrounding areas were completed on June 10, 2013, by Timothy Grenier with Pinyon Environmental, Inc. (Pinyon), to evaluate present conditions.

1.2.3 Interviews

Interviews were not conducted as part of this MESA.

1.2.4 Additional Services

Services beyond those required by ASTM or the City of Brighton were not completed.

1.2.5 Report

Presentation of the aforementioned services is in this report.

1.2.6 Qualifications

The modified environmental site assessment activities described herein were conducted in accordance with generally accepted standards, practices, and procedures (expressed or implied) in effect at the time of the project, relative to transportation projects in Colorado. Relevant information also was obtained from published sources (referenced in Section 6.0).

The project was completed by an Environmental Professional, or conducted under the supervision or responsibility of an Environmental Professional. At a minimum, the Environmental Professional was involved in planning the Site reconnaissance and interviews, and reviewed and interpreted the information used in developing the conclusions. Pinyon declares that, to the best of our professional knowledge and belief, the Environmental Professionals involved met the definition as defined in §312.1 of 40 Code of Federal Regulations (CFR) 312. Other persons involved are qualified individuals, and have the training and experience necessary to complete their assigned tasks. These personnel have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting as the subject property (Site). Resumes of the personnel involved in this project are included as Appendix A.

2. Project and Site Information

2.1 Project Overview

Date of Task Order: March 15, 2012

Work Authorized By: Jeffery R. Kullman, PE, Vice President, Atkins North America, Inc. (Atkins)

2.1.1 Purpose of Modified Phase I ESA

The purpose of the Modified Phase I ESA is to evaluate the potential for soil and/or groundwater contamination at the Site due to a release of hazardous substances or petroleum products. This Modified Phase I ESA is being performed at the request of Atkins to fulfill CDOT requirements for a National Environmental Policy Act (NEPA) reevaluation of a proposed corridor project. The City of Brighton is providing funding for the project (City of Brighton Contract #11-005). An EA is being conducted for the proposed project. The Modified Phase I ESA is being prepared as a supporting document for the Hazardous Materials section of the EA.

2.2 General Site Information and Current Conditions

2.2.1 Site Location (Exhibit 2-1)

Address: Bridge Street and Interstate 76
 City: Brighton
 County: Adams County
 Intersections: I-76 and Bridge Street; East Frontage Road and Bridge Street; and West Frontage Road and Bridge Street

2.2.2 Site Information

The Site is comprised of Bridge Street, I-76, East Frontage Road, and West Frontage Road, with no associated parcel numbers (Exhibit 2-1), in addition to private property. The table below provides information regarding the private properties located within the potential construction areas. Site owner, parcel number, and addresses (when available) are indicated in the table.

Exhibit 2-1 Site

Owner(s)	Parcel Number	Site Address
Western United Electric	0156911106010	100 Bromley Business Parkway, Brighton, CO 80603
Newton, Catherine	0156900000145	21955 E 160th Ave., Brighton, CO 80603
East Cherry Creek Valley Water	0156901301001	21850 I-76, Brighton, CO 80603
United Water and Sanitation District (Northern Water Treatment Plant)	0156900000113	Not found. This property is located to the north of the Bridge Street and West Frontage Road intersection.
ADS Builders, Inc.	0156911105036	Not found. This property is located to the southwest of the Bridge Street and West Frontage Road intersection.
ADS Builders, Inc.	0156911105032	Not found. This property is located to the southwest of the Bridge Street and West Frontage Road intersection.

Source: Adams County Assessor Website

Site Reconnaissance Information

Dates of Site Visit: June 10, 2013
 Personnel: Timothy Grenier, Pinyon
 Methodology: The Site was accessed and observed by driving or walking the entire extent of the project area. In areas where it was safe to park, the Site was physically walked and visually observed while photographs were taken. Notes regarding Site conditions were made on field aerial photographs and in a field notebook. The Site was observed entirely from public ROW. No privately owned properties were entered during this assessment.
 Inaccessible Areas: None
 Other Limiting Conditions: None

2.2.3 Current Uses (including unoccupied spaces): I-76 and Bridge Street

Current Site Use and Conditions

The Bridge Street bridge is located on the Site.

Site Description and Former Uses

The Site has been developed with a road consistent with the current I-76 configuration since at least 1942. A road consistent with the current Bridge Street configuration has been present since at least 1948.

2.2.4 Past Uses if Visible: None

Photographs of the Site are provided in Appendix B. General Site observations required by the ASTM standard practice are summarized on Exhibit 2. A glossary of terms is included as Appendix C.

3. Site Description

3.1 Physical Setting

3.1.1 Topography

The study area has a general topographic gradient to the east-southeast.

Elevation

The elevation of the Site is approximately 5,051 feet above mean sea level (msl) (USGS, 1987).

Surficial Soil

Surficial soils within the project area consist of the Vona series. Vona is a Class B soil with moderate infiltration rates, deep and moderately deep, moderately well and well drained soils with moderately coarse textures, from surface level to approximately 22 inches below ground surface (bgs) (EDR, 2013).

Surficial Geology

The surficial geology at the Site is classified as alluvial sand, silt, clay, and gravel (Louviere and Slocum Alluviums, undivided; late middle Pleistocene) (Moore, et al, 2001).

Regional Geology

The Site is located with the early-Tertiary late-Cretaceous age Denver formation or the lower part of the Dawson Arkose formation, which consists of arkosic sandstone, shale, mudstone, conglomerate, and local coal beds (Tweto, 1979).

Nearest Surface Water Body

The West Burlington Extension Ditch and the Speer Canal are approximately 600 feet and 1,600 feet, respectively, to the west-northwest of the study area. There is a retention pond located approximately 550 feet to the north and a second retention pond approximately 2,500 feet to the northeast of the study area.

Groundwater Conditions

Typically, groundwater flow direction mimics topography. Based on the topographic conditions of the Site, the groundwater flow direction is likely toward the east-southeast. Groundwater on the Site occurs at approximately 20 feet bgs (Hillier, et al, 1983).

3.2 General Site Environmental Conditions

3.2.1 PCBs

Transformers

During the reconnaissance survey, four pad-mounted electric transformers were observed within the project vicinity. Electrical transformers have the potential to include fluid that contains polychlorinated biphenyls (PCBs). Although PCBs were generally banned in 1979, the installation dates of the transformers observed within the project vicinity are unknown. These transformers have the potential to contain PCBs; however, they are likely owned and operated by a local utility provider (Xcel Energy or United Power). In the event of a release or relocation, the management of the regulated waste would be the responsibility of the utility provider. No substantial evidence of a release (e.g., staining) was noted on or around the observed transformers.

3.2.2 Heating/Cooling Systems

No heating or cooling systems were found at the Site.

3.2.3 Solid Waste Disposal

No visual evidence of waste generation or disposal was noted at the Site.

3.2.4 Drums

Drums were not noted at the Site.

3.2.5 Drains and Sumps

No evidence of drains or sumps were noted at the Site except for stormwater drains located at the north and south ends of Bridge Street, just west of the East Frontage Road intersection.

3.2.6 Wells

Monitoring wells were not noted at the Site.

3.2.7 Fill Material

The Site is located along I-76 and Bridge Street. It is likely that areas of the Site have been altered by filling, grading, and improvement activities associated with the roadway (e.g., culvert, utilities). In addition, commercial development is currently located adjacent to the Site. These uses have likely required some degree of grading and/or site filling; however, there was no indication of improper filling during the Site visit.

3.2.8 Hazardous Substances or Petroleum Product Use

There was no visual evidence of hazardous material use or storage, or hazardous waste generation on the Site.

3.3 Other Environmental Conditions

3.3.1 Asbestos Containing Building Materials (ACBMs)

The demolition of structures and/or bridges is not anticipated as part of the proposed project; therefore, asbestos samples were not collected as part of this Modified Phase I ESA.

3.3.2 Heavy-Metal Based Paint

The demolition of structures and/or bridges is not anticipated as part of the proposed project; therefore, paint samples were not collected as part of this Modified Phase I ESA.

3.4 Site History

3.4.1 Resources

The following resources were used in developing the Site history:

- Aerial photographs from selected years between 1948 and 2011
- Historical SGS topographic maps, from selected years between 1890 and 2010
- City Directories from selected years between 1985 to 2012
- Site reconnaissance conducted June 10, 2013

A complete list of references is included as Section 7.0.

Exhibit 3-1 Summary of Site History

From	To	Site Use
Prior to 1890	Around 1942	Vacant
1942	Present	The Site has been developed with a road consistent with the current I-76 configuration since at least 1942. A road consistent with the current Bridge Street configuration has been developed since at least 1948.

4. Adjacent and Nearby Properties

4.1 General Offsite Description

4.1.1 Zoning

The adjacent properties in the vicinity of the Site are zoned for agricultural use (A-3).

Exhibit 4-1 Adjacent Site Use

Direction from Site	Adjacent Site Use
North	Residential development and Northern Water Treatment Plant
East	Bridge Street, East Frontage Road, and vacant land
South	East Frontage Road, Western United Electric Supply Corporation, and Pony Express Mini Storage
West	Bridge Street, West Frontage Road, and residences

4.1.2 General Regional Property Use

Surrounding areas generally are comprised of roads, residential, light industrial, and commercial developments.

4.2 Sensitive Environmental Offsite Uses (Current and Historical)

Based on information gathered from offsite reconnaissance and resources reviewed, there were no establishments offsite but in the area identified as having the potential to impact the Site.

5. Conclusions

5.1 Findings

Based on the information obtained and reviewed (see Appendix D), no RECs, historical RECs, or *de minimis* conditions were identified on the Site or the adjacent properties.

5.2 Opinion

Based on the information obtained and reviewed, there is no indication that construction activities for the I-76 and Bridge Street interchange will disturb any hazardous materials.

5.3 Additional Investigations

No additional investigations are warranted at this time.

5.4 Data Gaps

The ASTM Standard requires that interviews (e.g., Site property owners/occupants, previous property owners, adjacent property owners/occupants, etc.) be conducted to obtain information regarding hazardous materials utilized, stored, or generated at the Site. Historical research has indicated that the Site has only been used as an Interstate and a road. Site property owners were not interviewed during this assessment; however, due to the historic use of the Site, this data gap is not considered to be significant to the findings in this report.

5.5 Conclusions

Pinyon has performed a Modified Phase I Environmental Site Assessment, in conformance with the scope and limitations of ASTM Practice E 1527, of I-76 and the Bridge Street bridge. Any exceptions to, or deletions from, this practice are described in Section 7.1 of this report. This assessment has not revealed evidence of any recognized environmental conditions in connection with this property.

5.6 Conclusions and Recommendations Regarding Additional Services

The following recommendation is presented:

- Workers on this project must follow CDOT Specification 250—Environmental, Health, and Safety Management.
- In the unlikely event that suspected ACM is encountered, including with buried utilities, workers must follow CDOT Specification 250.07—Asbestos-Containing Material Management and CDOT Asbestos-Contaminated Soil Management Standard Operating Procedure. Additionally, depending on the type of ACM, this material also must be abated in accordance with either Section 5.5 of the Solid Waste Regulations, or Regulation No. 8 of the Air Quality Control Commission Regulations. Workers on this project must follow CDOT Specification 250—Environmental, Health, and Safety Management.

6. Limitations

This report was prepared by Pinyon Environmental, Inc., at the request of and for the sole benefit of the City of Brighton and Atkins North America, Inc. (Atkins), or any entity controlling, controlled by, or under common control with Atkins. This report addresses certain physical characteristics of the Site with regard to the release or presence of hazardous materials. It is not intended to warrant or otherwise imply that the Site is or is not free from conditions, materials, or substances which could adversely impact the environment or pose a threat to public health and safety. The material in this report reflects the best judgement of Pinyon in light of the information that was readily available at the time of preparation.

This report is for the exclusive and present use of the City of Brighton, and Atkins, or any entity controlling, controlled by, or under common control with Atkins, to assist with an environmental evaluation of the Site. In the event of any reuse or publication of any portion of this report, Pinyon Environmental, Inc., shall not be liable for any damages arising out of such reuse of publication. Any use a third party makes of this report, or any reliance on or decisions to be made on it, are the responsibility of such third party. Pinyon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

The principles outlined in Section 4.5 of the ASTM Standard are an integral part of this practice and are intended to be referred to in resolving any ambiguity or exercising such discretion as is accorded the user or environmental professional in performing an environmental site assessment or in judging whether a user or environmental professional has conducted appropriate inquiry or has otherwise conducted an adequate environmental site assessment.

This report does not address additional requirements that must be met to qualify for the landowner liability protections (LLPs) (for example, the continuing obligation not to impede the integrity and effectiveness of activity and use limitations (AULs), or the duty to take reasonable steps to prevent releases, or the duty to comply with legally required release reporting obligations). Additionally, the report user has responsibilities with respect to All Appropriate Inquiry and LLPs.

6.1 Deletions and Deviations from Standard

This report was not completed to the requirements of the ASTM standard. The following deviations are presented; however, due to the nature of the Site (a bridge and roads) this is not considered to be a data gap:

Owners of properties that may be acquired were not interviewed in support of this Modified Phase I ESA, and a User Questionnaire was not provided. Additionally, the local health department was not contacted.

7. References

- Cole, Greater Denver Area City Directory. Cole Directories, Denver, Colorado, 1985, 1988, 1991, 1992, 1996, 2000, 2005, 2008, and 2012.
- EDR Radius Map Report with GeoCheck, 2013, Bridge Street—Proposed Interchange, Bridge Street and I-76, Brighton, CO, 80603, dated May 31, 2013.
- Pinyon obtained the following aerial photographs from EDR: 1948, 1964, 1969, 1971, 1978, 1984, 1988, 1991, 1993, 1999, 2002, 2005, 2006, 2009, and 2011.
- U.S. Geological Survey (USGS)—Hillier, Schneider, and Hutchinson, 1983. "Depth to the Water Table (1976-77) in the Great Denver Area, Front Range Urban Corridor, Colorado."
- U.S. Geological Survey (USGS)—Moore, et al, 2001. "Generalized Surficial Geologic Map of the Denver 1 degree x 2 degree Quadrangle, Colorado."
- U.S. Geological Survey (USGS)—Tweto, 1979. "Geological Map of Colorado."
- U.S. Geological Survey (USGS), in Cooperation with Colorado State Geological Survey Board and Colorado Metal Mining Fund—Burbank, et al, 1935. "Geologic Map of Colorado."
- U.S. Geological Survey (USGS), "7.5-Minute Topographic Map, Mile High Lakes, Colorado Quadrangle," United States Geological Survey, 1942, 1966, and 2010.
- U.S. Geological Survey (USGS), "7.5-Minute Topographic Map, Denver East, Colorado Quadrangle," United States Geological Survey, 1890 and 1981.
- U.S. Geological Survey (USGS), "7.5-Minute Topographic Map, Denver, Colorado Quadrangle," United States Geological Survey, 1953, 1957, and 1960.

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Appendices

Appendix A: Resumes

Appendix B: Photographic Log

Appendix C: Glossary of Terms

Appendix D: Agency Database Report



PROFESSIONAL EXPERIENCE

Ms. Evans has 27 years of consulting experience, primarily in subsurface investigations and remediation projects involving hazardous waste and petroleum contamination. She has acted as project manager on all phases of these projects from initial assessment through remedial design and implementation. Her experience includes management of projects at RCRA facilities and at CERCLA sites, including PRP support. She has extensive Phase I Environmental Site Assessment experience and has assisted clients with regulatory compliance issues, as well as environmental permitting and sensitive issue identification. Ms. Evans has also assisted attorneys with technical aspects of environmental litigation and has acted as an expert witness.

EDUCATION

B.S., Geological Engineering,
Colorado School of Mines,
1982

M.S., Geological
Engineering, Colorado
School of Mines, (no degree)

PE LICENSES

Colorado, License #27007
(1990)
Nebraska, License #E-11779
(2006)
New York, License #085662
(2008)
Nevada, License #20415
(2009)

REGISTRATIONS

OPS Registered Consultant
Program, Colorado,
Individual Number 5131

CERTIFICATIONS

OSHA Health & Safety,
Colorado

8-Hour OSHA Supervisor,
Colorado

Engineering Expert Witness,
No. EEW23, Colorado

First Aid and CPR, Colorado

MEMBERSHIPS

Immediate Past President
American Council of

RELEVANT EXPERIENCE

Environmental Site Assessments. Ms. Evans has extensive experience in performing site assessments for property transfers. She has conducted, managed, or reviewed over 2,000 site assessments throughout the nation. She is familiar with the current ASTM standards for both Phase I Assessments and Transaction Screenings and has been a frequent lecturer on All Appropriate Inquiry and the 2005 ASTM Standards. Ms. Evans has also managed projects requiring the completion of numerous Phase I ESAs in a short period of time. The largest of these involved assessments of more than 100 properties located in the Midwest over a three and one-half week period. Ms. Evans has helped several clients in the development of a company program, which has included a standardized project process and report format.

Phase II Environmental Site Assessments. Ms. Evans has conducted numerous Phase II assessments for evaluating soil and ground-water contamination. These projects have involved volatile and semi-volatile organic compounds, pesticides and herbicides, metals, radioactive elements, and biological contaminants. She has completed all aspects of these projects from sampling plan design and implementation through report preparation and closure. Ms. Evans has employed numerous sampling technologies, including multi-port sampling wells and random sampling schemes.

USTs. Ms. Evans has managed UST projects from tank removal through remediation and closure. She has conducted UST projects in Colorado, Nevada, Texas, and Missouri. Specific services on these projects have included reimbursement assistance, contaminant investigations in unique settings (i.e., fractured bedrock and tidal areas), agency negotiations and compliance assessments. Ms. Evans was the client and project manager on a \$500,000 UST contract for the City and County of Denver.

Engineering Companies of
Colorado (ACEC/CO)

ACEC/CO Environmental
Committee

ACEC National
Environmental Business
Committee

**VOLUNTEER
INVOLVEMENT**

Socially Conscious Coffee,
Denver, Colorado, 2006-
Present: Board of Directors
Member

Denver CASA (Court
Appointed Special
Advocate), Denver,
Colorado, 1999-2006: Child
Advocate

Iliff Ridge HOA, Lakewood,
Colorado, 2000-present:
president

Expert Witness Testimony. Ms. Evans has served as an expert witness on many cases. These cases have involved underground storage tank, contaminated surface water, historical site use, fuel spills, Class V injection wells, and explosive gas migration issues. She has assisted attorneys in the identification of key points, strengths and weaknesses of the technical aspects of the case, collection of additional information, and preparation of reports to the court. Ms. Evans has been recognized as an expert by the court and has been deposed and testified as an expert witness. She is certified by the American Council of Engineering Companies of Colorado as an Engineering Expert Witness.

RCRA. Ms. Evans has performed corrective measure studies, developed emergency and post-closure monitoring plans, evaluated waste streams to determine if they were hazardous, and performed oversight and certification of closure. She has also assisted in ground-water monitoring under post-closure permit conditions.

PUBLICATION

Evans, Lauren "In-field Processing of Time Domain Electromagnetic (TDEM) Sounding Data," Proceedings from GeoTech '86: Computer Aided Methods of Geology and Engineering, AIPG, 1986.

Evans, Lauren. "In-Field Processing of Time Domain Electromagnetic (TDEM) Sounding Data," Proceedings from GeoTech'86: Computer Aided Methods of Geology and Engineering, AIPG,, 1986.

Hoekstra, Pieter & Lauren Evans "Transient Electromagnetic (TDEM) Sounding for Mapping the Interface Between Fresh Water and Saline Water in Coastal Aquifers," Hydrological Science and Technology: Short Papers, AIH, 1987.

Hoesktra, Pieter & Lauren Evans "Time Domain Electromagnetic (TDEM) Exploration for Characterization of Injection Zones and Salt Water Intrusion Mapping," Proceedings of the Focus Conference on Southeastern Ground Water Issues, NWWA, 1989.

Mills, Theodore, Peter Hoekstra, Mark Blohm, & Lauren Evans "Time Domain Electromagnetic Soundings for Mapping Sea-Water Intrusion in Monterey County, California," Ground Water, November-December, 1988.

Appendix B: Photographic Log



View of the north side of the study area.



View of the south side of the study area.



View of the east side of the study area.



View of the west side of the study area.



View of a retention pond, located to the northwest of the study area.



View of a residential property followed by Interstate 76, located to the north of the study area.



View of Northern Water Treatment Plant, located to the northeast of the study area.



View of an open field, located to the southeast of the study area.



View of Western United Electric Supply Corporation, located to the south of the study area.



View of a drainage ditch, located to the southeast of the study area.



View of East Frontage Road, located to the east and south of the study area.



View of asphalt and concrete stockpiles, located to the south of the study area.



View of undeveloped land, located to the southwest of the study area.



View of Bridge Street, running east-west through the study area and project vicinity.



View of residential properties, located to the west of the study area.

Appendix C

GLOSSARY OF TERMS

AAI	All Appropriate Inquiry - that inquiry into the previous ownership and uses of the <i>property</i> consistent with good commercial or customary practice as defined in CERCLA, 42 U.S.C §9601(35)(B).
ACBM	Asbestos Containing Building Material. Any surfacing, thermal systems insulation or miscellaneous material found in or on interior structural members which contains more than one percent asbestos.
ACGIH	American Conference of Governmental Industrial Hygienists
AHERA	Asbestos Hazard Emergency Response Act
ASHARA	Asbestos School Hazard Re-Authorization Act
AST	Above-ground Storage Tank
ASTM	American Society of Testing and Materials
AUL	Activity and use limitations. Legal or physical restrictions or limitations on the use of, or access to, a site or facility: (1) to reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil or ground water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment.
Bona fide prospective purchaser liability protection	A form of liability protection offered under AAI; knowledge of contamination would not generally preclude this liability protection. A person must make <i>all appropriate inquiry</i> on or before the date of purchase. The facility must have been purchased after January 11, 2002. Other necessary requirements also apply.
CAA	Clean Air Act
CDPHE	Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act, commonly referred to as Superfund.
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
Contiguous property owner liability protection	A form of liability protection offered under AAI; a person may qualify for the <i>contiguous property owner liability protection</i> if, among other requirements, such person owns real <i>property</i> that is contiguous to, and that is or may be contaminated by <i>hazardous substances</i> from other real <i>property</i> that is not owned by that person. To qualify, the <i>all appropriate inquiry</i> completed before the

GLOSSARY OF TERMS

purchase must not result in knowledge of contamination. Other necessary requirements also apply.

CORRACTS

RCRA Corrective Action Site

COT

Chain of Title

CWA

Clean Water Act

Data failure

Under the ASTM Standard, a failure to achieve the historical research objectives, even after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.

Data gap

Under the ASTM Standard, lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information.

EC

Engineering controls. Physical modifications to a site or facility (for example, capping, slurry walls, or point of use water treatment) to reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property. Engineering controls are a type of activity and use limitation (AUL).

Environmental lien

A charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property, including (but not limited to) liens imposed pursuant to CERCLA and similar state or local laws.

Environmental professional

A person meeting the education, training, and experience requirements as set forth in 40 CFR §312.10(b).

EPA

Environmental Protection Agency

EPCRA

Emergency Planning and Community Right-to-Know Act

ERNS

Emergency Response Notification System

ESA

Environmental Site Assessment

FIFRA

Federal Insecticide, Fungicide and Rodenticide Act

Hazardous Materials

Hazardous material means any substance, waste, or material determined by any state, federal or local governmental authority to be capable of posing a risk of injury to health, safety and property,

GLOSSARY OF TERMS

including, but not limited to, all substances, wastes and materials designated, defined or listed as hazardous, extremely hazardous or toxic pursuant to the Clean Water Act, 33 USC Sec. 1251, et seq.; Resource Conservation and Recovery Act, 42 USC Sec. 6901 et. seq.; the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 USC Sec. 9601, et. seq.; the United States Department of Transportation Hazardous Material Table, 49 CFR Part 172; regulations of the Environmental Protection Agency, 40 CFR Part 302; or such substances, materials and wastes that are or become regulated under any applicable local, state or federal law, and including any asbestos, petroleum and any petroleum fractions, urea formaldehyde foam insulation, chlorofluorocarbons (CFCs), or polychlorinated biphenyls (PCBs).

Hazardous Substance

Defined by CERCLA. Includes substances designated for special consideration under the CAA, the CWA, or the TSCA, and any hazardous wastes defined under RCRA. EPA can designate additional substances as hazardous if they present substantial danger to health and the environment.

Hazardous Waste

Waste defined in RCRA, which, due to its quantity, concentration, or physical, chemical or infectious characteristics, may present a hazard to human health or the environment.

IC

A legal or administrative restriction (for example, “deed restrictions,” restrictive covenants, easements, or zoning) on the use of, or access to, a site or facility to (1) reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil or ground water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment.. An institutional control is a type of AUL.

LBP

Lead-Based Paint

LQG

Large Quantity Generator. Refers to a generator who generates more than 1,000 kilograms of hazardous waste in a calendar month.

LUST

Leaking Underground Storage Tank

Major occupants

Those tenants, subtenants, or other persons or entities each of which uses at least 40 % of the leasable area of the property or any anchor tenant when the property is a shopping center.

mg/Kg

milligram per kilogram

mg/L

milligram per liter

GLOSSARY OF TERMS

NAD	No Action Determination (Colorado VCUP)
NESHAP	National Emission Standard for Hazardous Air Pollutants
NFA	No Further Action
NFRAP	No Further Remedial Action Planned (CERCLA)
NIOSH	National Institute for Occupational Safety and Health
NLR	No Longer Regulated. Refers to a generator that is no longer regulated. Reasons for non classification include: Failure to report in a timely manner, no longer in business, no longer in business at the listed address, and/or no longer generating hazardous waste materials in quantities which require reporting.
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List (Superfund sites)
NVLAP	National Voluntary Laboratory Accreditation Program
OIS	Oil Inspection Section, Colorado Department of Labor and Employment
OTHERHW	Listed RCRA Facilities but do not fit into category of CORRACTS, TSDs, or Generators; includes Transporters, Non-Notifiers, former Generators, and others.
OSHA	Occupational Safety and Health Administration
PA/SI	Preliminary Assessment/Site Investigation (CERCLA study)
PCB	Polychlorinated biphenyl
PEL	Permissible Exposure Limit
PLM	Polarized Light Microscopy, a method of analyzing bulk samples for asbestos.
ppb	Parts-per-billion
ppm	Parts-per-million
RECs	Recognized Environmental Conditions
RCRA	Resource Conservation and Recovery Act
RCRA-Viol	RCRA facilities with a reported violation

GLOSSARY OF TERMS

RCRIS	Resource Conservation and Recovery Information System
RCRIS- TSDC	RCRA TSD facilities subject to corrective action
RFA	RCRA Facility Assessment (RCRA study).
RFI	RCRA Facility Investigation (RCRA study).
RI/FS	Remedial Investigation/Feasibility Study (CERCLA study).
SCL	State CERCLIS Equivalent Site
SDWA	Safe Drinking Water Act
SPILLS	State spills list and federal ERNS list.
SPL	State NPL Equivalent Site
SQG	Small Quantity Generator. Refers to a generator who generate between 100 and 1,000 kilograms of hazardous waste in a calendar month.
SWLF	Solid Waste Landfill
TRIS	Toxic Release Inventory System
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TSD	Treatment, Storage or Disposal (refers to RCRA facilities).
µg/Kg	microgram per kilogram
µg/L	microgram per liter
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UST	Underground Storage Tank
VCUP	Voluntary Cleanup Program (Colorado Program)
VGN	Conditionally Exempt Generator. Refers to a generator who generate less than 100 kilograms of hazardous waste in a calendar month.
Viol/Enf	Violations/Enforcement Actions (RCRA)

GLOSSARY OF TERMS

VSQ

Very Small Quantity Generator. Refers to a generator who generates less than 100 kilograms of hazardous waste in a calendar month.

Other terms may be used that are defined in the *ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, E 1527-05.

Appendix D

Bridge Street - Proposed Interchange

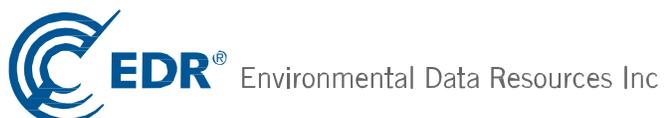
Bridge Street and I-76

Brighton, CO 80603

Inquiry Number: 3622506.2s

May 31, 2013

The EDR Radius Map™ Report with GeoCheck®



440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

BRIDGE STREET AND I-76
BRIGHTON, CO 80603

COORDINATES

Latitude (North): 39.9869000 - 39° 59' 12.84"
Longitude (West): 104.7359000 - 104° 44' 9.24"
Universal Transverse Mercator: Zone 13
UTM X (Meters): 522548.4
UTM Y (Meters): 4426126.5
Elevation: 5051 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 39104-H6 MILE HIGH LAKES, CO
Most Recent Revision: 1994

North Map: 40104-A6 HUDSON, CO
Most Recent Revision: 1994

West Map: 39104-H7 BRIGHTON, CO
Most Recent Revision: 1994

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year: 2011
Source: USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
NPL LIENS..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL..... National Priority List Deletions

Federal CERCLIS list

CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP..... CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG..... RCRA - Large Quantity Generators
RCRA-SQG..... RCRA - Small Quantity Generators
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROL..... Sites with Institutional Controls
LUCIS..... Land Use Control Information System

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS..... This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

EXECUTIVE SUMMARY

State and tribal landfill and/or solid waste disposal site lists

SWF/LF Solid Waste Sites & Facilities

State and tribal leaking storage tank lists

LUST Leaking Underground Storage Tank List
LUST TRUST RAP Site Listing
LAST Leaking Aboveground Storage Tank Listing
INDIAN LUST Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST Underground Storage Tank Database
AST Aboveground Tank List
INDIAN UST Underground Storage Tanks on Indian Land
FEMA UST Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

AUL Environmental Covenants and Environmental Use Restrictions List

State and tribal voluntary cleanup sites

INDIAN VCP Voluntary Cleanup Priority Listing
VCP Voluntary Cleanup & Redevelopment Act Application Tracking Report

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI Open Dump Inventory
DEBRIS REGION 9 Torres Martinez Reservation Illegal Dump Site Locations
SWRCY Registered Recyclers Listing
HIST LF Historical Landfill List
INDIAN ODI Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL Clandestine Drug Labs
CDL Meth Lab Locations
US HIST CDL National Clandestine Laboratory Register

Local Land Records

LIENS 2 CERCLA Lien Information

Records of Emergency Release Reports

HMIRS Hazardous Materials Information Reporting System

EXECUTIVE SUMMARY

CO ERNS Spills Database
SPILLS 90 SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR RCRA - Non Generators DOT
OPS Incident and Accident Data
DOD Department of Defense Sites
FUDS Formerly Used Defense Sites
CONSENT Superfund (CERCLA) Consent Decrees
ROD Records Of Decision
UMTRA Uranium Mill Tailings Sites
US MINES Mines Master Index File
TRIS Toxic Chemical Release Inventory System
TSCA Toxic Substances Control Act
FTTS FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS FIFRA/TSCA Tracking System Administrative Case Listing
SSTS Section 7 Tracking Systems
ICIS Integrated Compliance Information System
PADS PCB Activity Database System
MLTS Material Licensing Tracking System
RADINFO Radiation Information Database
FINDS Facility Index System/Facility Registry System
RAATS RCRA Administrative Action Tracking System
RMP Risk Management Plans
METHANE SITE Methane Site Investigations - Jefferson County 1980
Methane Investigation Methane Gas & Swamp Findings
DRYCLEANERS Drycleaner Facilities
NPDES Permitted Facility Listing
AIRS Permitted Facility & Emissions Listing
UMTRA Uranium Mill Tailings Sites
ASBESTOS Asbestos Abatement & Demolition Projects
INDIAN RESERV Indian Reservations
SCRD DRYCLEANERS State Coalition for Remediation of Drycleaners Listing
MINES Permitted Mines Listing
US AIRS Aerometric Information Retrieval System Facility Subsystem
PRP Potentially Responsible Parties
2020 COR ACTION 2020 Corrective Action Program List
LEAD SMELTERS Lead Smelter Sites
EPA WATCH LIST EPA WATCH LIST
US FIN ASSUR Financial Assurance Information
PCB TRANSFORMER PCB Transformer Registration Database
COAL ASH DOE Steam-Electric Plant Operation Data
COAL ASH EPA Coal Combustion Residues Surface Impoundments List
Financial Assurance Financial Assurance Information Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners EDR Exclusive Historic Dry Cleaners

EXECUTIVE SUMMARY

SURROUNDING SITES: SEARCH RESULTS

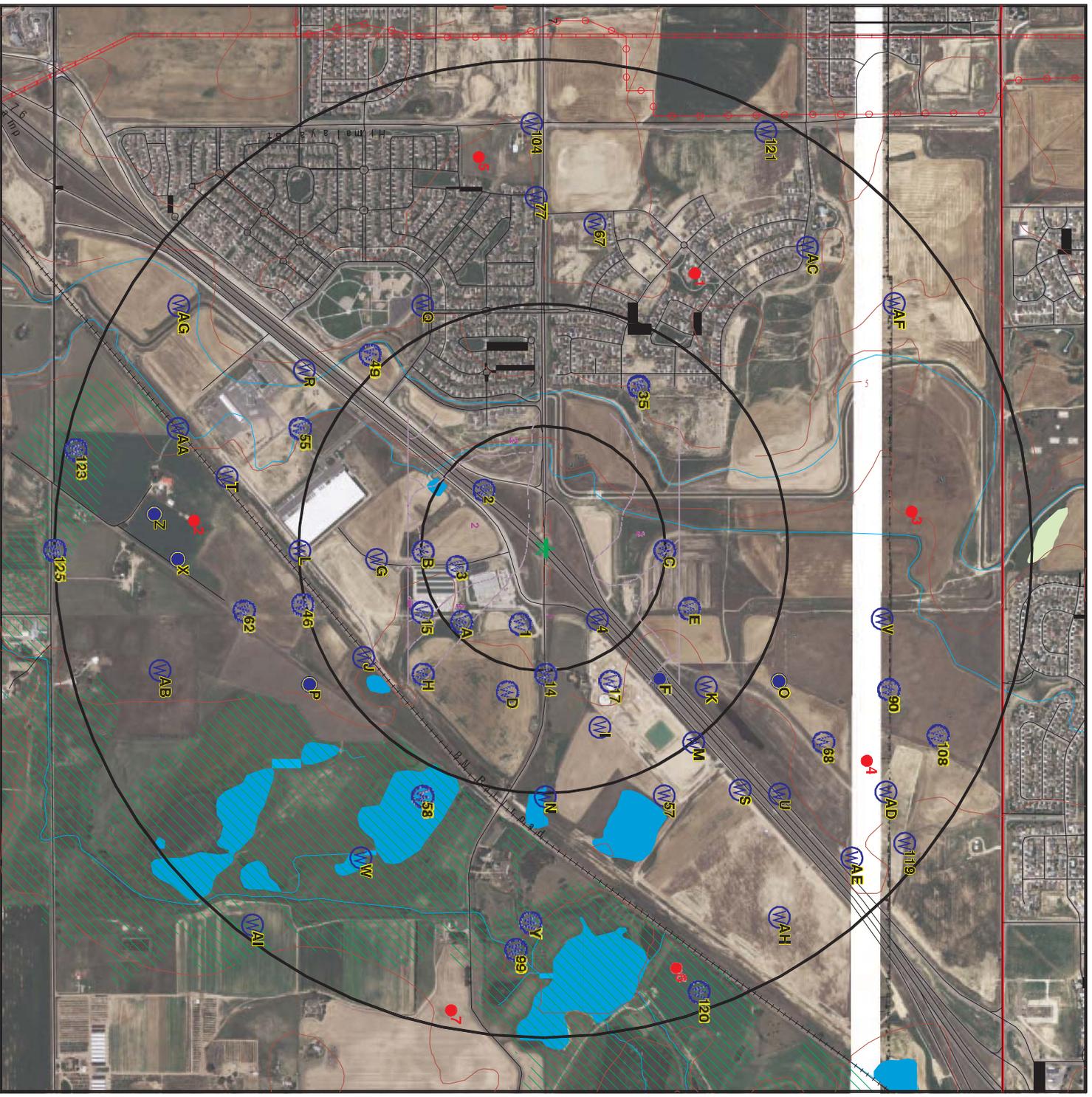
Surrounding sites were not identified.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

<u>Site Name</u>	<u>Database(s)</u>
KERR-MCGEE GATHERING - STATE C.S.	FINDS,AIRS (AFS)
KERR-MCGEE - HALEY 41-13	FINDS,AIRS (AFS)
B & G OIL FIELD SUPPLY	CERCLIS-NFRAP
BRIGHTON DRUM	CERCLIS-NFRAP
MOBILE PREMIX CONCRETE	LUST,UST
C&M CONCRETE	LUST
BRIGHTON READY MIX PLANT	LAST
LAFARGE WEST INC	UST
CM CONCRETE	UST
RAINBOW TANK	UST
SUBURBAN READY MIX	AST
BRIGHTON READY MIX PLANT	AST
JIMS WATER SERVICE OF CO HOLDING T	FINDS,RCRA-NLR
RIBLET PRODUCTS OF COLORADO#	FINDS,RCRA-NLR
LAFARGE WEST, INC. - TANI PIT	FINDS
AGGREGATE INDUSTRIES - WCR, INC.	FINDS
BRIGHTON READY MIX - AGGREGATE	FINDS
INERT FILL	HIST LF
FLY ASH DISPOSAL SITE	HIST LF
AGGREGATE INDUSTRIES - WCR, INC.	AIRS



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Manufactured Gas Plants
- ▲ National Priority List Sites
- ▲ Dept. Defense Sites

- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Bridge Street - Proposed Interchange
ADDRESS: Bridge Street and L76
 Brighton CO 80603
LAT/LONG: 39.9869 / 104.7359

CLIENT: Plyon Environmental Engr.
CONTACT: Tim Greiner
INQUIRY #: 3622506.2S
DATE: May 31, 2013 6:34 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
<i>Federal NPL site list</i>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
<i>Federal Delisted NPL site list</i>								
Delisted NPL	1.000		0	0	0	0	NR	0
<i>Federal CERCLIS list</i>								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
<i>Federal CERCLIS NFRAP site List</i>								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
<i>Federal RCRA CORRACTS facilities list</i>								
CORRACTS	1.000		0	0	0	0	NR	0
<i>Federal RCRA non-CORRACTS TSD facilities list</i>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<i>Federal RCRA generators list</i>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<i>Federal institutional controls / engineering controls registries</i>								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
<i>Federal ERNS list</i>								
ERNS	TP		NR	NR	NR	NR	NR	0
<i>State- and tribal - equivalent CERCLIS</i>								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
<i>State and tribal landfill and/or solid waste disposal site lists</i>								
SWF/LF	0.500		0	0	0	NR	NR	0
<i>State and tribal leaking storage tank lists</i>								
LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	0	NR	NR	0
LAST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<i>State and tribal registered storage tank lists</i>								
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
<i>State and tribal institutional control / engineering control registries</i>								
AUL	0.500		0	0	0	NR	NR	0
<i>State and tribal voluntary cleanup sites</i>								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
<u>ADDITIONAL ENVIRONMENTAL RECORDS</u>								
<i>Local Brownfield lists</i>								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
<i>Local Lists of Landfill / Solid Waste Disposal Sites</i>								
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
<i>Local Lists of Hazardous waste / Contaminated Sites</i>								
US CDL	TP		NR	NR	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
<i>Local Land Records</i>								
LIENS 2	TP		NR	NR	NR	NR	NR	0
<i>Records of Emergency Release Reports</i>								
HMIRS	TP		NR	NR	NR	NR	NR	0
CO ERNS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
<i>Other Ascertainable Records</i>								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
METHANE SITE	TP		NR	NR	NR	NR	NR	0
Methane Investigation	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
ASBESTOS	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

NO SITES FOUND

Count: 20 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BRIGHTON	1000281607	RIBLET PRODUCTS OF COLORADO#	HWY 85 N	80601	FINDS,RCRA-NLR
BRIGHTON	1000376258	JIMS WATER SERVICE OF CO HOLDING T	6000 HWY 85	80601	FINDS,RCRA-NLR
BRIGHTON	1001578605	CM CONCRETE	1857 US HWY 85	80601	UST
BRIGHTON	1003877361	B & G OIL FIELD SUPPLY	BETWEEN N MAIN & HWY 85-N	80601	CERCLIS-NFRAP
BRIGHTON	1003877703	BRIGHTON DRUM	152 ST. OR BROMLEY LANE 2 MILE	80601	CERCLIS-NFRAP
LOCHBUIE, 3.0 MI S O	1004446960	KERR-MCGEE GATHERING - STATE C.S.	NW SW SEC 16 T1S R65W	80601	FINDS,AIRS (AFS)
GREELEY	1004447464	KERR-MCGEE - HALEY 41-13	NE NE SEC 13 T1N R68W	80603	FINDS,AIRS (AFS)
BRIGHTON	1004450761	LAFARGE WEST, INC. - TANI PIT	EAST 132ND AVENUE AT NOME STRE	80601	FINDS
BRIGHTON	1010035775	BRIGHTON READY MIX - AGGREGATE	1859 HIGHWAY 85	80601	FINDS
BRIGHTON	1012075834	AGGREGATE INDUSTRIES - WCR, INC.	835 HWY 85	80603	FINDS
BRIGHTON	A100270407	SUBURBAN READY MIX	975 HWY 85	80603	AST
BRIGHTON	A100348515	BRIGHTON READY MIX PLANT	1857 HWY 85	80601	AST
	S100795426	FLY ASH DISPOSAL SITE	HWY 224 & YORK		HIST LF
	S100795434	INERT FILL	124TH HWY 6&85		HIST LF
BRIGHTON	S102052394	C&M CONCRETE	US HWY 85 & WELD CR 6	80601	LUST
BRIGHTON AREA	S108118797	AGGREGATE INDUSTRIES - WCR, INC.	1859 US HIGHWAY 85	80603	AIRS
BRIGHTON	S111868662	BRIGHTON READY MIX PLANT	1857 HWY 85	80601	LAST
BRIGHTON	U003116473	MOBILE PREMIX CONCRETE	1021 HWY 85	80601	LUST,UST
BRIGHTON	U003550481	RAINBOW TANK	1651 US HWY 85	80601	UST
BRIGHTON	U004127694	LAFARGE WEST INC	ROUTE 2 BOX 1020	80601	UST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 02/01/2013	Source: EPA
Date Data Arrived at EDR: 03/01/2013	Telephone: N/A
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 05/09/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 02/01/2013	Source: EPA
Date Data Arrived at EDR: 03/01/2013	Telephone: N/A
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 05/09/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 02/01/2013	Source: EPA
Date Data Arrived at EDR: 03/01/2013	Telephone: N/A
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 05/09/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/04/2013	Source: EPA
Date Data Arrived at EDR: 03/01/2013	Telephone: 703-412-9810
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 05/29/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/09/2012	Telephone: 703-603-8704
Date Made Active in Reports: 12/20/2012	Last EDR Contact: 04/10/2013
Number of Days to Update: 72	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/05/2013	Source: EPA
Date Data Arrived at EDR: 03/01/2013	Telephone: 703-412-9810
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 05/29/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 05/09/2013
	Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/21/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 6

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/02/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 05/02/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 05/02/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 05/02/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 05/02/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/14/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/29/2013	Telephone: 703-603-0695
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 03/11/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/14/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/29/2013	Telephone: 703-603-0695
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 03/11/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005	Source: Department of the Navy
Date Data Arrived at EDR: 12/11/2006	Telephone: 843-820-7326
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 05/20/2013
Number of Days to Update: 31	Next Scheduled EDR Contact: 09/02/2013
	Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2012	Source: National Response Center, United States Coast Guard
Date Data Arrived at EDR: 01/17/2013	Telephone: 202-267-2180
Date Made Active in Reports: 02/15/2013	Last EDR Contact: 04/02/2013
Number of Days to Update: 29	Next Scheduled EDR Contact: 07/15/2013
	Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A	Source: Department of Public Health & Environment
Date Data Arrived at EDR: N/A	Telephone: 303-692-3300
Date Made Active in Reports: N/A	Last EDR Contact: 05/20/2013
Number of Days to Update: N/A	Next Scheduled EDR Contact: 09/02/2013
	Data Release Frequency: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Sites & Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 12/31/2012	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 02/18/2013	Telephone: 303-692-3300
Date Made Active in Reports: 03/08/2013	Last EDR Contact: 05/17/2013
Number of Days to Update: 18	Next Scheduled EDR Contact: 08/26/2013
	Data Release Frequency: Annually

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank List

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 12/10/2012	Source: Department of Labor and Employment, Oil Inspection Section
Date Data Arrived at EDR: 12/28/2012	Telephone: 303-318-8521
Date Made Active in Reports: 01/14/2013	Last EDR Contact: 04/15/2013
Number of Days to Update: 17	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Quarterly

TRUST: LUST Trust Sites

Reimbursement application package. The 1989 Colorado General Assembly established Colorado's Petroleum Storage Tank Fund. The Fund reimburses eligible applicants for allowable costs incurred in cleaning up petroleum contamination from underground and aboveground petroleum storage tanks, as well as for third-party liability expenses. Remediation of contamination caused by railroad or aircraft fuel is not eligible for reimbursement. The Fund satisfies federal Environmental Protection Agency financial assurance requirements. Monies in the Fund come from various sources, predominantly the state environmental surcharge imposed on all petroleum products except railroad or aircraft fuel.

Date of Government Version: 01/28/2013	Source: Department of Labor and Employment, Oil Inspection Section
Date Data Arrived at EDR: 02/01/2013	Telephone: 303-318-8521
Date Made Active in Reports: 03/08/2013	Last EDR Contact: 05/13/2013
Number of Days to Update: 35	Next Scheduled EDR Contact: 07/15/2013
	Data Release Frequency: Varies

LAST: Leaking Aboveground Storage Tank Listing

A listing of leaking aboveground storage tank sites.

Date of Government Version: 12/10/2012	Source: Department of Labor & Employment
Date Data Arrived at EDR: 12/28/2012	Telephone: 303-318-8525
Date Made Active in Reports: 01/14/2013	Last EDR Contact: 04/15/2013
Number of Days to Update: 17	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 12/31/2012	Source: EPA Region 7
Date Data Arrived at EDR: 02/28/2013	Telephone: 913-551-7003
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 04/29/2013
Number of Days to Update: 43	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012	Source: EPA Region 8
Date Data Arrived at EDR: 08/28/2012	Telephone: 303-312-6271
Date Made Active in Reports: 10/16/2012	Last EDR Contact: 04/29/2013
Number of Days to Update: 49	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/06/2013	Source: EPA Region 4
Date Data Arrived at EDR: 02/08/2013	Telephone: 404-562-8677
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 04/29/2013
Number of Days to Update: 63	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Semi-Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/05/2013	Source: EPA Region 10
Date Data Arrived at EDR: 02/06/2013	Telephone: 206-553-2857
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 04/29/2013
Number of Days to Update: 65	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 09/28/2012	Source: EPA Region 1
Date Data Arrived at EDR: 11/01/2012	Telephone: 617-918-1313
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 05/01/2013
Number of Days to Update: 162	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011	Source: EPA Region 6
Date Data Arrived at EDR: 09/13/2011	Telephone: 214-665-6597
Date Made Active in Reports: 11/11/2011	Last EDR Contact: 04/29/2013
Number of Days to Update: 59	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2013	Telephone: 415-972-3372
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 04/29/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Underground Storage Tank Database

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/28/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 17

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 04/15/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Quarterly

AST: Aboveground Tank List

Aboveground storage tank locations.

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/28/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 17

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 04/15/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/21/2013
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 45

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 156

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 02/08/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2012	Source: EPA Region 7
Date Data Arrived at EDR: 02/28/2013	Telephone: 913-551-7003
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 04/29/2013
Number of Days to Update: 43	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011	Source: EPA Region 6
Date Data Arrived at EDR: 05/11/2011	Telephone: 214-665-7591
Date Made Active in Reports: 06/14/2011	Last EDR Contact: 04/29/2013
Number of Days to Update: 34	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012	Source: EPA Region 5
Date Data Arrived at EDR: 08/03/2012	Telephone: 312-886-6136
Date Made Active in Reports: 11/05/2012	Last EDR Contact: 04/29/2013
Number of Days to Update: 94	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013	Source: EPA Region 10
Date Data Arrived at EDR: 02/06/2013	Telephone: 206-553-2857
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 04/29/2013
Number of Days to Update: 65	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010	Source: FEMA
Date Data Arrived at EDR: 02/16/2010	Telephone: 202-646-5797
Date Made Active in Reports: 04/12/2010	Last EDR Contact: 04/18/2013
Number of Days to Update: 55	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

AUL: Environmental Real Covenants List

Senate Bill 01-145 gave authority to the Colorado Department of Public Health and Environment to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. When a contaminated site is not cleaned up completely, land use restrictions may be used to ensure that the selected cleanup remedy is adequately protective of human health and the environment.

Date of Government Version: 01/14/2013	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 01/14/2013	Telephone: 303-692-3331
Date Made Active in Reports: 01/30/2013	Last EDR Contact: 05/28/2013
Number of Days to Update: 16	Next Scheduled EDR Contact: 08/19/2013
	Data Release Frequency: Varies

State and tribal voluntary cleanup sites

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012	Source: EPA, Region 1
Date Data Arrived at EDR: 10/02/2012	Telephone: 617-918-1102
Date Made Active in Reports: 10/16/2012	Last EDR Contact: 04/05/2013
Number of Days to Update: 14	Next Scheduled EDR Contact: 07/15/2013
	Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008	Source: EPA, Region 7
Date Data Arrived at EDR: 04/22/2008	Telephone: 913-551-7365
Date Made Active in Reports: 05/19/2008	Last EDR Contact: 04/20/2009
Number of Days to Update: 27	Next Scheduled EDR Contact: 07/20/2009
	Data Release Frequency: Varies

VCP: Voluntary Cleanup & Redevelopment Act Application Tracking Report

The Voluntary Cleanup and Redevelopment Act is intended to permit and encourage voluntary cleanups by providing a method to determine clean-up responsibilities in planning the reuse of property. The VCRA was intended for sites which were not covered by existing regulatory programs.

Date of Government Version: 10/19/2012	Source: Department of Public Health and Environmental
Date Data Arrived at EDR: 01/22/2013	Telephone: 303-692-3331
Date Made Active in Reports: 03/08/2013	Last EDR Contact: 04/15/2013
Number of Days to Update: 45	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: Semi-Annually

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/10/2012	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/11/2012	Telephone: 202-566-2777
Date Made Active in Reports: 12/20/2012	Last EDR Contact: 03/26/2013
Number of Days to Update: 9	Next Scheduled EDR Contact: 07/08/2013
	Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009	Source: EPA, Region 9
Date Data Arrived at EDR: 05/07/2009	Telephone: 415-947-4219
Date Made Active in Reports: 09/21/2009	Last EDR Contact: 04/29/2013
Number of Days to Update: 137	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HISTORICAL LANDFILL: Historical Landfill List Abandoned/Inactive Landfills.

Date of Government Version: 01/31/1993
Date Data Arrived at EDR: 04/24/1994
Date Made Active in Reports: 05/30/1994
Number of Days to Update: 36

Source: Department of Public Health & Environment
Telephone: 303-692-3300
Last EDR Contact: 09/05/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Registered Recyclers Listing

A listing of registered recycler locations in the state of Colorado.

Date of Government Version: 03/18/2013
Date Data Arrived at EDR: 03/19/2013
Date Made Active in Reports: 04/24/2013
Number of Days to Update: 36

Source: Department of Public Health & Environment
Telephone: 303-692-3337
Last EDR Contact: 03/18/2013
Next Scheduled EDR Contact: 07/01/2013
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 05/03/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/12/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 59

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2013
Next Scheduled EDR Contact: 06/17/2013
Data Release Frequency: Quarterly

CDL: Meth Lab Locations

Meth lab locations that were reported to the Department of Public Health & Environment.

Date of Government Version: 01/07/2013
Date Data Arrived at EDR: 01/08/2013
Date Made Active in Reports: 01/30/2013
Number of Days to Update: 22

Source: Department of Public Health and Environment
Telephone: 303-692-3023
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 55

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/02/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Annually

CO ERNS: Spills Database

State reported spills.

Date of Government Version: 01/07/2013
Date Data Arrived at EDR: 01/08/2013
Date Made Active in Reports: 01/30/2013
Number of Days to Update: 22

Source: Department of Public Health and Environmental
Telephone: 303-692-2000
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 10/15/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/06/2013
Number of Days to Update: 34

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 02/12/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/15/2013	Telephone: 303-312-6149
Date Made Active in Reports: 02/27/2013	Last EDR Contact: 05/02/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 07/15/2013
	Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012	Source: Department of Transportation, Office of Pipeline Safety
Date Data Arrived at EDR: 08/07/2012	Telephone: 202-366-4595
Date Made Active in Reports: 09/18/2012	Last EDR Contact: 05/07/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 08/19/2013
	Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005	Source: USGS
Date Data Arrived at EDR: 11/10/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 04/19/2013
Number of Days to Update: 62	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011	Source: U.S. Army Corps of Engineers
Date Data Arrived at EDR: 02/26/2013	Telephone: 202-528-4285
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 03/11/2013
Number of Days to Update: 15	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2011	Source: Department of Justice, Consent Decree Library
Date Data Arrived at EDR: 01/15/2013	Telephone: Varies
Date Made Active in Reports: 03/13/2013	Last EDR Contact: 04/01/2013
Number of Days to Update: 57	Next Scheduled EDR Contact: 07/15/2013
	Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/18/2012	Source: EPA
Date Data Arrived at EDR: 03/13/2013	Telephone: 703-416-0223
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 03/13/2013
Number of Days to Update: 30	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010	Source: Department of Energy
Date Data Arrived at EDR: 10/07/2011	Telephone: 505-845-0011
Date Made Active in Reports: 03/01/2012	Last EDR Contact: 05/28/2013
Number of Days to Update: 146	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/05/2013	Source: Department of Labor, Mine Safety and Health Administration
Date Data Arrived at EDR: 04/18/2013	Telephone: 303-231-5959
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 03/06/2013
Number of Days to Update: 22	Next Scheduled EDR Contact: 06/17/2013
	Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 09/01/2011	Telephone: 202-566-0250
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 05/29/2013
Number of Days to Update: 131	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006	Source: EPA
Date Data Arrived at EDR: 09/29/2010	Telephone: 202-260-5521
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 03/28/2013
Number of Days to Update: 64	Next Scheduled EDR Contact: 07/08/2013
	Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009	Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 05/28/2013
Number of Days to Update: 25	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009	Source: EPA
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 05/28/2013
Number of Days to Update: 25	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2007
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2008
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 12/10/2010	Telephone: 202-564-4203
Date Made Active in Reports: 02/25/2011	Last EDR Contact: 04/29/2013
Number of Days to Update: 77	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/10/2011	Telephone: 202-564-5088
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 04/15/2013
Number of Days to Update: 61	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2012	Source: EPA
Date Data Arrived at EDR: 01/16/2013	Telephone: 202-566-0500
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 04/19/2013
Number of Days to Update: 114	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011	Source: Nuclear Regulatory Commission
Date Data Arrived at EDR: 07/15/2011	Telephone: 301-415-7169
Date Made Active in Reports: 09/13/2011	Last EDR Contact: 03/11/2013
Number of Days to Update: 60	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/09/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/11/2013	Telephone: 202-343-9775
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 04/11/2013
Number of Days to Update: 29	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/23/2011	Source: EPA
Date Data Arrived at EDR: 12/13/2011	Telephone: (303) 312-6312
Date Made Active in Reports: 03/01/2012	Last EDR Contact: 03/12/2013
Number of Days to Update: 79	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

RMP: Risk Management Plans

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/25/2012	Telephone: 202-564-8600
Date Made Active in Reports: 07/10/2012	Last EDR Contact: 04/29/2013
Number of Days to Update: 46	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011	Source: EPA/NTIS
Date Data Arrived at EDR: 02/26/2013	Telephone: 800-424-9346
Date Made Active in Reports: 04/19/2013	Last EDR Contact: 05/30/2013
Number of Days to Update: 52	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Biennially

METHANE SITE: Methane Site Investigations - Jefferson County 1980

The objectives of the study are to define as closely as possible the boundaries of methane producing solid waste landfills.

Date of Government Version: 12/31/1980	Source: Jefferson County Health Department
Date Data Arrived at EDR: 02/13/1995	Telephone: 303-239-7175
Date Made Active in Reports: 04/04/1995	Last EDR Contact: 01/27/1995
Number of Days to Update: 50	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

METHANE INVESTIGATION: Methane Gas & Swamp Findings

The primary objective of this study was to assess methane gas related hazards at selected landfill sites in Colorado. These sites were selected by the Colorado Department of Health following evaluation of responses received from County and Municipal agencies about completed and existing landfills within their jurisdiction.

Date of Government Version: 03/15/1979	Source: Department of Health
Date Data Arrived at EDR: 02/13/1995	Telephone: 303-640-3335
Date Made Active in Reports: 04/04/1995	Last EDR Contact: 01/27/1995
Number of Days to Update: 50	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

DRYCLEANERS: Drycleaner Facilities

A listing of drycleaning facilities.

Date of Government Version: 03/14/2013	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 03/15/2013	Telephone: 303-692-3213
Date Made Active in Reports: 04/24/2013	Last EDR Contact: 03/11/2013
Number of Days to Update: 40	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Varies

NPDES: Permitted Facility Listing

A listing of permitted facilities from the Water Quality Control Division.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 02/07/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 29

Source: Department of Public Health & Environment
Telephone: 303-692-3611
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

AIRS: Permitted Facility & Emissions Listing

A listing of Air Pollution Control Division permits and emissions data.

Date of Government Version: 03/13/2013
Date Data Arrived at EDR: 03/26/2013
Date Made Active in Reports: 04/24/2013
Number of Days to Update: 29

Source: Department of Public Health & Environment
Telephone: 303-692-3213
Last EDR Contact: 03/25/2013
Next Scheduled EDR Contact: 06/24/2013
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

There were nine uranium mill tailings sites in Colorado designated for cleanup under the federal Uranium Mill Tailings Radiation Control Act. These nine sites, known commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going.

Date of Government Version: 11/23/2004
Date Data Arrived at EDR: 03/21/2007
Date Made Active in Reports: 05/02/2007
Number of Days to Update: 42

Source: Department of Public Health & Environment
Telephone: 970-248-7164
Last EDR Contact: 05/30/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

ASBESTOS: Asbestos Abatement & Demolition Projects

Asbestos abatement and demolition projects by the contractor.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/12/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 24

Source: Department of Public Health & Environment
Telephone: 303-692-3100
Last EDR Contact: 05/13/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Semi-Annually

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005	Source: U.S. Geological Survey
Date Data Arrived at EDR: 02/06/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 04/19/2013
Number of Days to Update: 339	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: N/A

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/04/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/15/2013	Telephone: 202-566-1917
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 05/20/2013
Number of Days to Update: 56	Next Scheduled EDR Contact: 09/02/2013
	Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/18/2012	Telephone: 703-308-4044
Date Made Active in Reports: 05/25/2012	Last EDR Contact: 05/17/2013
Number of Days to Update: 7	Next Scheduled EDR Contact: 08/26/2013
	Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001	Source: American Journal of Public Health
Date Data Arrived at EDR: 10/27/2010	Telephone: 703-305-6451
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 12/02/2009
Number of Days to Update: 36	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/14/2013	Telephone: 703-603-8787
Date Made Active in Reports: 02/27/2013	Last EDR Contact: 04/08/2013
Number of Days to Update: 13	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/25/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 42

Source: Department of Public Health & Environment
Telephone: 303-392-3350
Last EDR Contact: 04/23/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Varies

MINES: Permitted Mines Listing

This dataset represents permitted mines in the State of Colorado

Date of Government Version: 09/19/2011
Date Data Arrived at EDR: 12/26/2012
Date Made Active in Reports: 02/01/2013
Number of Days to Update: 37

Source: Division of Reclamation Mining and safety
Telephone: 303-866-3567
Last EDR Contact: 12/26/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/30/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 04/01/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/30/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 04/01/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Annually

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/18/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 12/02/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 69

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 04/04/2013
Next Scheduled EDR Contact: 07/15/2013
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/19/2011	Telephone: 202-566-0517
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 05/03/2013
Number of Days to Update: 83	Next Scheduled EDR Contact: 08/12/2013
	Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005	Source: Department of Energy
Date Data Arrived at EDR: 08/07/2009	Telephone: 202-586-8719
Date Made Active in Reports: 10/22/2009	Last EDR Contact: 04/18/2013
Number of Days to Update: 76	Next Scheduled EDR Contact: 07/29/2013
	Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/03/2011	Telephone: N/A
Date Made Active in Reports: 03/21/2011	Last EDR Contact: 03/15/2013
Number of Days to Update: 77	Next Scheduled EDR Contact: 06/24/2013
	Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/23/2013	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 01/25/2013	Telephone: 303-692-3350
Date Made Active in Reports: 03/08/2013	Last EDR Contact: 04/23/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ADAMS COUNTY:

Summary Report on Methane Gas Hazards and Surveys Conducted on Domestic and Demolition Landfills in Adams County
As of May 8, 1978, all known landfills or dumping sites in the Adams County area have been surveyed.

Date of Government Version: 05/08/1978
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

ARAPAHOE COUNTY:

A Survey of Landfills in Arapahoe County

A survey of Arapahoe County was conducted from August through November, 1977, of all open and closed landfills and dumpsites in the county. Each of the sites found was classified as domestic or demolition.

Date of Government Version: 12/31/1978
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

BOULDER COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Old Landfill Sites

Landfill sites in Boulder county.

Date of Government Version: 05/01/1986
Date Data Arrived at EDR: 11/14/1995
Date Made Active in Reports: 12/07/1995
Number of Days to Update: 23

Source: Boulder County Health Department
Telephone: 303-441-1182
Last EDR Contact: 01/30/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DENVER COUNTY:

Landfills in Denver County

Landfill sites in the city and county of Denver.

Date of Government Version: 11/08/2000
Date Data Arrived at EDR: 12/07/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 38

Source: City and County of Denver
Telephone: 303-436-7300
Last EDR Contact: 12/07/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Investigation of Methane Gas Hazards

The purpose of this study was to assess the actual and potential generation, migration, explosive and related problem associated with specified old landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. Eight sites determined to be priorities due to population density and potential hazards to population and property were selected by the Colorado Department of Health.

Date of Government Version: 01/01/1981
Date Data Arrived at EDR: 01/29/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 38

Source: City and County of Denver Department of Environmental Health
Telephone: 720-865-5522
Last EDR Contact: 01/15/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DOUGLAS COUNTY:

Douglas County Landfill Key

Landfill sites in Douglas county.

Date of Government Version: 06/12/1991
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

PUEBLO COUNTY:

Designated Disposal & Landfill Sites

Only inert materials. Asphalt, cement, dirt & rock unless otherwise specified. These sites are no longer active.

Date of Government Version: 04/30/1990
Date Data Arrived at EDR: 11/16/1995
Date Made Active in Reports: 12/07/1995
Number of Days to Update: 21

Source: Pueblo City-County Health Department
Telephone: 719-583-4300
Last EDR Contact: 11/13/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

TRI COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Tri-County Area Solid Waste Facilities List (Adams, Arapahoe and Douglas Counties)

Closed Domestic Landfills in Adams County, Closed Domestic Landfills in Arapahoe County, Closed Demolition Landfills in Arapahoe County, Closed Domestic Landfills in Douglas County.

Date of Government Version: 10/15/1983
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

WELD COUNTY:

Solid Waste Facilities in Weld County

Solid Waste Facilities in Weld County.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/18/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 18

Source: Weld County Department of Public Health
Telephone: 970-304-6415
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 02/18/2013
Date Data Arrived at EDR: 02/18/2013
Date Made Active in Reports: 03/21/2013
Number of Days to Update: 31

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/21/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 02/07/2013
Date Made Active in Reports: 03/15/2013
Number of Days to Update: 36

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/09/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 57

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/23/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 09/27/2012
Number of Days to Update: 70

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/18/2013
Next Scheduled EDR Contact: 07/01/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: Rextag Strategies Corp.
Telephone: (281) 769-2247

U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health
Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Daycare Listing

Source: Department of Human Services
Telephone: 303-866-5958

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data

Source: Division of Wildlife
Telephone: 970-416-3360

Scanned Digital USGS 7.5' Topographic Map (DRG)

Source: United States Geologic Survey

A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

BRIDGE STREET - PROPOSED INTERCHANGE
BRIDGE STREET AND I-76
BRIGHTON, CO 80603

TARGET PROPERTY COORDINATES

Latitude (North): 39.9869 - 39° 59' 12.84"
Longitude (West): 104.7359 - 104° 44' 9.24"
Universal Transverse Mercator: Zone 13
UTM X (Meters): 522548.4
UTM Y (Meters): 4426126.5
Elevation: 5051 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map: 39104-H6 MILE HIGH LAKES, CO
Most Recent Revision: 1994

North Map: 40104-A6 HUDSON, CO
Most Recent Revision: 1994

West Map: 39104-H7 BRIGHTON, CO
Most Recent Revision: 1994

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County
ADAMS, CO

FEMA Flood
Electronic Data
YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 08001C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property
NOT AVAILABLE

NWI Electronic
Data Coverage
YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION</u> <u>FROM TP</u>	<u>GENERAL DIRECTION</u> <u>GROUNDWATER FLOW</u>
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

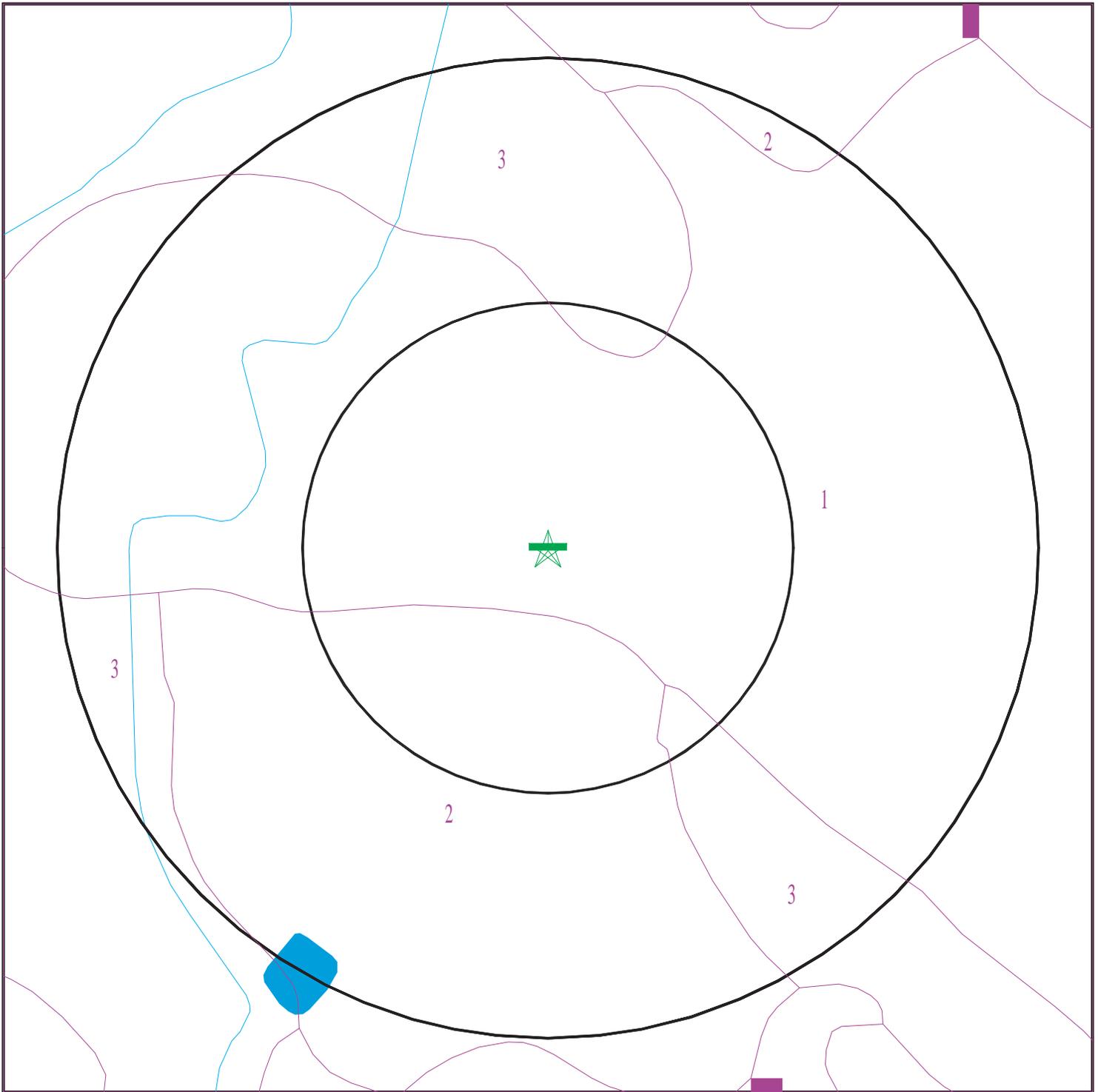
Era:	Mesozoic
System:	Cretaceous
Series:	Navarro Group
Code:	uK4 (<i>decoded above as Era, System & Series</i>)

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3622506.2s



- ★ Target Property
- SSURGO Soil
- Water



SITE NAME: **Bridge Street - Proposed Interchange**
ADDRESS: **Bridge Street and I-76**
Brighton CO 80603
LAT/LONG: **39.9869 / 104.7359**

CLIENT: **Plyon Environmental Engr.**
CONTACT: **Tim Grenler**
INQUIRY #: **3622506.2s**
DATE: **May 31, 2013 6:35 pm**

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Vona

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 9 Min: 7.9
2	9 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 9 Min: 7.9
3	22 inches	59 inches	loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 9 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: Ascalon

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	9 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42.33 Min: 14.11	Max: 9 Min: 7.9
2	9 inches	20 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42.33 Min: 14.11	Max: 9 Min: 7.9
3	20 inches	27 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42.33 Min: 14.11	Max: 9 Min: 7.9
4	27 inches	59 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42.33 Min: 14.11	Max: 9 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 3

Soil Component Name: Vona

Soil Surface Texture: loamy sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	9 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 9 Min: 7.9
2	9 inches	22 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 9 Min: 7.9
3	22 inches	59 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 9 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
D16	USGS40000215294	1/4 - 1/2 Mile ESE
17	USGS40000215357	1/4 - 1/2 Mile ENE
D18	USGS40000215293	1/4 - 1/2 Mile ESE
F36	USGS40000215380	1/4 - 1/2 Mile NE
P52	USGS40000215225	1/2 - 1 Mile SSE
O59	USGS40000215451	1/2 - 1 Mile NNE
X88	USGS40000215165	1/2 - 1 Mile South
Z91	USGS40000215160	1/2 - 1 Mile South
123	USGS40000215108	1/2 - 1 Mile SSW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
1	CO5000000362045	1/8 - 1/4 Mile ESE
2	CO5000000361877	1/8 - 1/4 Mile SW
3	CO5000000361707	1/8 - 1/4 Mile SSE
4	CO5000000362727	1/8 - 1/4 Mile NE
A5	CO5000000361779	1/8 - 1/4 Mile SE
A6	CO5000000361713	1/8 - 1/4 Mile SE
A7	CO5000000361714	1/8 - 1/4 Mile SE
B8	CO5000000361561	1/8 - 1/4 Mile South
B9	CO5000000361562	1/8 - 1/4 Mile South
B10	CO5000000361556	1/8 - 1/4 Mile South
C11	CO5000000363401	1/8 - 1/4 Mile North
C12	CO5000000363402	1/8 - 1/4 Mile North

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
C13	CO5000000363403	1/8 - 1/4 Mile North
14	CO5000000362313	1/4 - 1/2 Mile East
15	CO5000000361518	1/4 - 1/2 Mile SSE
E19	CO5000000363531	1/4 - 1/2 Mile NNE
E20	CO5000000363530	1/4 - 1/2 Mile NNE
F21	CO5000000363114	1/4 - 1/2 Mile NE
G22	CO5000000361300	1/4 - 1/2 Mile South
G23	CO5000000361301	1/4 - 1/2 Mile South
F24	CO5000000363397	1/4 - 1/2 Mile NE
F25	CO5000000363396	1/4 - 1/2 Mile NE
F26	CO5000000363399	1/4 - 1/2 Mile NE
F27	CO5000000363398	1/4 - 1/2 Mile NE
H28	CO5000000361560	1/4 - 1/2 Mile SE
H29	CO5000000361558	1/4 - 1/2 Mile SE
H30	CO5000000361559	1/4 - 1/2 Mile SE
F31	CO5000000363116	1/4 - 1/2 Mile NE
F32	CO5000000363117	1/4 - 1/2 Mile NE
I33	CO5000000362743	1/4 - 1/2 Mile ENE
I34	CO5000000362744	1/4 - 1/2 Mile ENE
35	CO5000000363013	1/4 - 1/2 Mile WNW
J37	CO5000000361202	1/4 - 1/2 Mile SSE
J38	CO5000000361203	1/4 - 1/2 Mile SSE
K39	CO5000000363627	1/4 - 1/2 Mile NE
K40	CO5000000363628	1/4 - 1/2 Mile NE
L41	CO5000000360780	1/4 - 1/2 Mile South
L42	CO5000000360781	1/4 - 1/2 Mile South
L43	CO5000000360782	1/4 - 1/2 Mile South
M44	CO5000000363549	1/2 - 1 Mile NE
M45	CO5000000363550	1/2 - 1 Mile NE
46	CO5000000360833	1/2 - 1 Mile SSE
N47	CO5000000362311	1/2 - 1 Mile East
N48	CO5000000362310	1/2 - 1 Mile East
49	CO5000000361253	1/2 - 1 Mile SW
O50	CO5000000364042	1/2 - 1 Mile NNE
O51	CO5000000364043	1/2 - 1 Mile NNE
Q53	CO5000000361572	1/2 - 1 Mile WSW
Q54	CO5000000361573	1/2 - 1 Mile WSW
55	CO5000000360796	1/2 - 1 Mile SSW
P56	CO5000000360774	1/2 - 1 Mile SSE
57	CO5000000363394	1/2 - 1 Mile ENE
58	CO5000000361557	1/2 - 1 Mile ESE
R60	CO5000000360840	1/2 - 1 Mile SW
R61	CO5000000360841	1/2 - 1 Mile SW
62	CO5000000360410	1/2 - 1 Mile SSE
S63	CO5000000363799	1/2 - 1 Mile NE
S64	CO5000000363800	1/2 - 1 Mile NE
T65	CO5000000360320	1/2 - 1 Mile SSW
T66	CO5000000360321	1/2 - 1 Mile SSW
67	CO5000000362707	1/2 - 1 Mile West
68	CO5000000364252	1/2 - 1 Mile NE
U69	CO5000000364051	1/2 - 1 Mile NE
U70	CO5000000364052	1/2 - 1 Mile NE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
V71	CO5000000364623	1/2 - 1 Mile North
V72	CO5000000364624	1/2 - 1 Mile North
V73	CO5000000364628	1/2 - 1 Mile NNE
V74	CO5000000364627	1/2 - 1 Mile NNE
V75	CO5000000364630	1/2 - 1 Mile NNE
V76	CO5000000364629	1/2 - 1 Mile NNE
77	CO5000000362142	1/2 - 1 Mile West
W78	CO5000000361187	1/2 - 1 Mile ESE
W79	CO5000000361186	1/2 - 1 Mile ESE
W80	CO5000000361188	1/2 - 1 Mile ESE
W81	CO5000000361190	1/2 - 1 Mile ESE
W82	CO5000000361189	1/2 - 1 Mile ESE
X83	CO5000000360063	1/2 - 1 Mile South
X84	CO5000000360011	1/2 - 1 Mile South
X85	CO5000000360012	1/2 - 1 Mile South
X86	CO5000000360009	1/2 - 1 Mile South
X87	CO5000000360010	1/2 - 1 Mile South
Y89	CO5000000362306	1/2 - 1 Mile East
90	CO5000000364711	1/2 - 1 Mile NNE
Y92	CO5000000362024	1/2 - 1 Mile East
AA93	CO5000000360031	1/2 - 1 Mile SSW
AA94	CO5000000360032	1/2 - 1 Mile SSW
AB95	CO5000000360006	1/2 - 1 Mile SSE
AC96	CO5000000364170	1/2 - 1 Mile NW
Z97	CO5000000359799	1/2 - 1 Mile South
Z98	CO5000000359800	1/2 - 1 Mile South
99	CO5000000362025	1/2 - 1 Mile East
AC100	CO5000000364166	1/2 - 1 Mile NW
AD101	CO5000000364591	1/2 - 1 Mile NE
AB102	CO5000000359765	1/2 - 1 Mile SSE
AE103	CO5000000364333	1/2 - 1 Mile NE
104	CO5000000362111	1/2 - 1 Mile West
AD105	CO5000000364808	1/2 - 1 Mile NE
AF106	CO5000000364804	1/2 - 1 Mile NW
AF107	CO5000000364805	1/2 - 1 Mile NW
108	CO5000000365024	1/2 - 1 Mile NNE
AG109	CO5000000360060	1/2 - 1 Mile SSW
AG110	CO5000000360061	1/2 - 1 Mile SSW
AG111	CO5000000360062	1/2 - 1 Mile SSW
AG112	CO5000000360058	1/2 - 1 Mile SSW
AG113	CO5000000360059	1/2 - 1 Mile SSW
AH114	CO5000000364045	1/2 - 1 Mile ENE
AH115	CO5000000364044	1/2 - 1 Mile ENE
AH116	CO5000000364047	1/2 - 1 Mile ENE
AH117	CO5000000364046	1/2 - 1 Mile ENE
AE118	CO5000000364517	1/2 - 1 Mile NE
119	CO5000000364873	1/2 - 1 Mile NE
120	CO5000000363579	1/2 - 1 Mile ENE
121	CO5000000363900	1/2 - 1 Mile WNW
AI122	CO5000000360519	1/2 - 1 Mile SE
AI124	CO5000000360414	1/2 - 1 Mile SE
125	CO5000000359276	1/2 - 1 Mile South

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	COOG90000048505	1/2 - 1 Mile WNW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE OIL/GAS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
2	COOG90000047752	1/2 - 1 Mile South
3	COOG90000048827	1/2 - 1 Mile North
4	COOG90000048763	1/2 - 1 Mile NNE
5	COOG90000048173	1/2 - 1 Mile West
6	COOG90000048460	1/2 - 1 Mile ENE
7	COOG90000048119	1/2 - 1 Mile ESE

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

1
ESE
1/8 - 1/4 Mile
Lower

CO WELLS CO5000000362045

Div:	1	Wd:	2
Wdid:	0	Receipt:	0538635C
Permitno:	263894	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	E 9
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NW	Coordsns:	938
Coordsns d:	N	Coordsew:	118
Coordsew d:	W	Utm x:	522796
Utm y:	4426050.5		
Loc accur:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	05/16/2005	Date permi:	06/22/2005
Date 1st b:	06/22/2007	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING LLC 24965 CR 69		
Mailing ci:	KERSEY		
Mailing st:	CO	Mailing zi:	80644-9401
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	05/08/2007		
Last actio:	Record corrected		
Site id:	CO5000000362045		

2
SW
1/8 - 1/4 Mile
Higher

CO WELLS CO5000000361877

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0015962
Permitrpl:	15962	Permitsuf:	MH
Current st:	Not Reported	Status des:	Well Abandoned
Case no:	11	Well name:	DC 61
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	0	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	11
Q40:	Not Reported	Q160:	NE
Coordsns d:	Not Reported	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	522355
Loc accura:	4425930		
Use1:	Spotted from quarters	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	acres		
Date per00:	0		
Date 1st b:	03/14/1990	Date permi:	03/14/1990
Date wel00:	06/12/1990	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	06/26/1991		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
Mailing ad:	0		
Mailing ci:	0	Full name:	LAND
Mailing st:	C/O 6450 YORK ST		
Driller li:	DENVER		
Date last :	CO	Mailing zi:	80229-7499
Last actio:	LIC	Pump lic:	Not Reported
Site id:	07/06/2010		
	Record corrected		
	CO5000000361877		

3
SSE
1/8 - 1/4 Mile
Lower

CO WELLS CO5000000361707

Div:	1	Wd:	2
Wdid:	0	Receipt:	3601999A
Permitno:	269557	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	TW-10
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS	Manageme00:	Not Reported
Management:	0	Designat00:	Not Reported
Designated:	0	Filing:	Not Reported
Subdivisio:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NE
Q40:	SE	Coordsns:	1620
Coordsns d:	N	Coordsew:	500
Coordsew d:	E	Utm x:	522607.90625
Utm y:	4425841.5		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	03/24/2006	Date permi:	06/26/2006
Date 1st b:	06/26/2008	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date the permit was issued.		
Site id:	CO5000000361707		

4

NE
1/8 - 1/4 Mile
Lower

CO WELLS

CO5000000362727

Div:	1	Wd:	2
Wdid:	0	Receipt:	9005078
Permitno:	109683	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NW	Coordsns:	100
Coordsns d:	N	Coordsew:	75
Coordsew d:	W	Utm x:	522782.5

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426306	Permitted :	8
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	DOMESTIC	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
Date per00:	Not Reported	Date permi:	08/23/1979
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	10/23/1974	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	SAVA JOSEPH A
Mailing ci:	RR 4 BOX 259		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601
Date last :	LR	Pump lic:	Not Reported
Last actio:	03/27/1992		
Site id:	Record corrected		
	CO5000000362727		

A5
SE
1/8 - 1/4 Mile
Lower

CO WELLS CO5000000361779

Div:	1	Wd:	2
Wdid:	0	Receipt:	0532595A
Permitno:	260931	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	MH-#2
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	1501
Coordsns d:	N	Coordsew:	48
Coordsew d:	W	Utm x:	522774.90625
Utm y:	4425879		
Loc accur:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	12/06/2004	Date permi:	12/20/2004

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	12/20/2006	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	UNITED WATER& SANITATION DISTRICT
Mailing ad:	C/O D HELTON CONSULTING LLC 24965 CR 69		
Mailing ci:	KERSEY		
Mailing st:	CO	Mailing zi:	80644-9401
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	11/07/2006		
Last actio:	Record corrected		
Site id:	CO5000000361779		

**A6
SE
1/8 - 1/4 Mile
Lower**

CO WELLS CO5000000361713

Div:	1	Wd:	2
Wdid:	209882	Receipt:	0538635E
Permitno:	263896	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	P 12
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	1605
Coordsns d:	N	Coordsew:	118
Coordsew d:	W	Utm x:	522796.3125
Utm y:	4425847		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	05/16/2005	Date permi:	06/22/2005
Date 1st b:	06/22/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	75
Pump rate:	39	Bperf:	60
Static wat:	0		
	9	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING LLC PO BOX 24		
Mailing ci:	KIOWA		
Mailing st:	CO	Mailing zi:	80117-

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	736	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date permit was canceled		
Site id:	CO5000000361713		

**A7
SE
1/8 - 1/4 Mile
Lower**

CO WELLS CO5000000361714

Div:	1	Wd:	2
Wdid:	209882	Receipt:	3602526A
Permitno:	64473	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	P-12
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.05		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	1605
Coordsns d:	N	Coordsew:	118
Coordsew d:	W	Utm x:	522796.3125
Utm y:	4425847		
Loc accura:	Spotted from section lines	Permitted :	4
Use1:	INDUSTRIAL	Permitte00:	2
Use2: Use3:	MUNICIPAL	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	04/07/2006	Date permi:	06/26/2006
Date 1st b:	06/26/2007	Date well :	01/24/2006
Date wel00:	Not Reported	Date pump :	08/17/2006
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	74
Pump rate:	29	Bperf:	59
Static wat:	604		
	13	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	EXST	Pump lic:	1200
Date last :	07/06/2007		
Last actio:	Record corrected		
Site id:	CO5000000361714		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

B8
South
1/8 - 1/4 Mile
Lower

CO WELLS CO5000000361561

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044513
Permitno:	44513	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-13
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522558.3125
Utm y:	4425729.5		
Loc accur:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000361561		

B9
South
1/8 - 1/4 Mile
Lower

CO WELLS CO5000000361562

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0045423
Permitrpl:	45423	Permitsuf:	MH
Current st:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Case no:	5	Well name:	P-12 & P-13
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	11
Q40:	Not Reported	Q160:	NE
Coordsns d:	SE	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	522558.3125
Loc accura:	4425729.5		
Use1:	Spotted from quarters	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	08/22/2005	Date permi:	08/23/2005
Date wel00:	11/20/2005	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	2 wells		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
	0		
	0	Full name:	UNITED WATER
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	08/23/2005		
Last actio:	Date the permit was issued.		
Site id:	CO5000000361562		

B10
South
1/8 - 1/4 Mile
Lower

CO WELLS CO5000000361556

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262J
Permitno:	10472	Permitsuf:	AD
Permitrpl:	Not Reported	Status des:	Application Denied
Current st:	3	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522558.3125
Utm y:	4425729		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	05/22/1984
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BRIGHTON CO
Mailing ci:	Not Reported		
Mailing st:	NORTHGLENN		
Driller li:	CO	Mailing zi:	80233
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	05/22/1984		
Site id:	Date the permit was issued. CO5000000361556		

**C11
North
1/8 - 1/4 Mile
Higher**

CO WELLS CO5000000363401

Div:	1	Wd:	2
Wdid:	0	Receipt:	0047495
Permitno:	47495	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522553.1875

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426525	Permitted :	Q
Loc accur:	Spotted from quarters	Permitte00:	Not Reported
Use1:	OTHER	Special us:	M
Use2: Use3:	Not Reported	Aquifer1 n:	QUATERNARY ALLUVIUM
Aquifer2 n:	MONITORING WELL		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	10/23/2007	Date permi:	10/25/2007
Date 1st b:	01/21/2008	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Three (3) holes to be constructed		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	10/25/2007		
Last actio:	Date the permit was issued.		
Site id:	CO5000000363401		

**C12
North
1/8 - 1/4 Mile
Higher**

CO WELLS CO5000000363402

Div:	1	Wd:	2
Wdid:	0	Receipt:	9002753
Permitno:	22232	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522553.1875
Utm y:	4426525		
Loc accur:	Spotted from quarters	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
	Not Reported	Date permi:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	Not Reported
Date 1st b:	11/19/1964	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	160
Tperf:	0	Bperf:	0
Pump rate:	12		
Static wat:	30	Full name:	RANDALL NETTIE & C H
Mailing ad:	RT 1		
Mailing ci:	BRIGHTON		
Mailing st:	CO	Mailing zi:	80601
Driller li:	Not Reported	Pump lic:	Not Reported
Date last :	07/18/2007		
Last actio:	Record corrected		
Site id:	CO5000000363402		

**C13
North
1/8 - 1/4 Mile
Higher**

CO WELLS CO5000000363403

Div:	1	Wd:	2
Wdid:	205966	Receipt:	9000070
Permitno:	419	Permitsuf:	R
Permitrpl:	Not Reported	Status des:	Well Abandoned
Current st:	11	Well name:	Not Reported
Case no:	W4033	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	0
Coordsns d:	S	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522553.1875
Utm y:	4426525		
Loc accura:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	05/31/1954	Date permi:	07/20/1959
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	05/01/1954	Date pump :	Not Reported
Comment :	04/17/1980		
Elev:	Not Reported		
Tperf:	0	Well depth:	58
Pump rate:	0	Bperf:	0
Static wat:	1100		
Mailing ad:	0	Full name:	DREYER DONALD
Mailing ci:	RT 1		
Mailing st:	BRIGHTON		
	CO	Mailing zi:	80601

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	LR	Pump lic:	Not Reported
Date last :	09/22/1995		
Last actio:	Record corrected		
Site id:	CO5000000363403		

**14
East
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000362313

Div:	1	Wd:	2
Wdid:	0	Receipt:	0043179
Permitno:	43179	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	C-2
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522961.6875
Utm y:	4426134.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	02/24/2004	Date permi:	03/02/2004
Date 1st b:	05/24/2004	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	no data		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	BROMLEY COMPANIES LLC
Mailing ad:	C/O ATEST INC P O BOX 262121		
Mailing ci:	HIGHLANDS RANCH		
Mailing st:	CO	Mailing zi:	80163-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	11/01/2004		
Last actio:	Record corrected		
Site id:	CO5000000362313		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

15
SSE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000361518

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044199
Permitno:	44199	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Well Abandoned
Current st:	11	Well name:	LH-1045 OW
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	2000
Coordsns d:	N	Coordsew:	10
Coordsew d:	E	Utm x:	522757.40625
Utm y:	4425726.5		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	10/08/2004	Date permi:	10/12/2004
Date 1st b:	01/06/2005	Date well :	10/18/2004
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	05/17/2006		
Elev:	Not Reported		
Tperf:	0	Well depth:	25
Pump rate:	10	Bperf:	24
Static wat:	0		
	0	Full name:	EAST CHERRY CREEK VALLEY WATER & SAN
Mailing ad:	C/O LYMAN HENN 110 16TH ST STE 900		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80202-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	05/30/2006		
Last actio:	Date abandonment report received.		
Site id:	CO5000000361518		

D16
ESE
1/4 - 1/2 Mile
Lower

FED USGS USGS40000215294

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395909104434801		
Monloc name:	SC00106612BBC1 USGS 395909104434801		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.985817
Longitude:	-104.7305244	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5041.50
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		
Aquifer type:	Not Reported		
Construction date:	19540101	Welldepth:	62.8
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel

1957-11-07	14.50	

17
ENE
1/4 - 1/2 Mile
Lower

FED USGS USGS40000215357

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395920104434901		
Monloc name:	SC00106601CCC1 USGS 395920104434901		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.9888725
Longitude:	-104.7308022	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5040.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported	Welldepth:	65
Construction date:	19560101	Wellholedepth:	Not Reported
Welldepth units:	ft		
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

D18
ESE
1/4 - 1/2 Mile
Lower

FED USGS USGS40000215293

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395909104434701		
Monloc name:	SC00106612BBC2 USGS 395909104434701		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.985817
Longitude:	-104.7302467	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5041.50
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		
Aquifer type:	Not Reported		
Construction date:	19240101	Welldepth:	28.1
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel

1955-10-12	19.90	

E19
NNE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000363531

Div:	1	Wd:	2
Wdid:	0	Receipt:	0517285
Permitno:	254287	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	890
Coordsns d:	S	Coordsew:	55
Coordsew d:	E	Utm x:	522735.90625
Utm y:	4426607.5		
Loc accura:	User supplied	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	11/06/2003	Date permi:	12/02/2003
Date 1st b:	12/02/2005	Date well :	04/12/2004
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	72
Pump rate:	32	Bperf:	62
Static wat:	1150		
	16	Full name:	BRIGHTON EAST HOLDING LLC
Mailing ad:	C/O JEHN WATER CONSULTANTS 1565 GILPIN ST		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80218-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	04/22/2004		
Last actio:	Date the Well Construction and Test Report was received at DWR.		
Site id:	CO5000000363531		

**E20
NNE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000363530

Div:	1	Wd:	2
Wdid:	205966	Receipt:	0026538
Permitno:	419	Permitsuf:	R
Permitrpl:	R	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	890
Coordsns d:	S	Coordsew:	5
Coordsew d:	E	Utm x:	522751.1875

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426607.5	Permitted :	1
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	IRRIGATION	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	115		
Annual app:	acres		
Date appli:	345		
Date per00:	11/27/1979	Date permi:	01/09/1980
Date 1st b:	Not Reported	Date well :	04/18/1980
Date wel00:	Not Reported	Date pump :	04/17/1980
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	63
Pump rate:	40	Bperf:	58
Static wat:	0		
Mailing ad:	18	Full name:	BAUMGARTNER H F
Mailing ci:	PO BOX 8		
Mailing st:	BRIGHTON CO 806		
Driller li:	01	Mailing zi:	8-6-1
Date last :	1	Pump lic:	1
Last actio:	09/22/1995		
Site id:	Record corrected CO5000000363530		

**F21
NE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000363114

Div:	1	Wd:	2
Wdid:	0	Receipt:	0538635A
Permitno:	263891	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	E 7
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	477
Coordsns d:	S	Coordsew:	574
Coordsew d:	W	Utm x:	522930.90625
Utm y:	4426482		
Loc accur:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	05/16/2005	Date permi:	06/22/2005

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	06/22/2007	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING LLC 24965 CR 69		
Mailing ci:	KERSEY		
Mailing st:	CO	Mailing zi:	80644-9401
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	05/08/2007		
Last actio:	Record corrected		
Site id:	CO5000000363114		

G22
South
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000361300

Div:	1	Wd:	2
Wdid:	209884	Receipt:	0538635F
Permitno:	263897	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	P 12
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NE
Q40:	SE	Coordsns:	2485
Coordsns d:	N	Coordsew:	572
Coordsew d:	E	Utm x:	522586.3125
Utm y:	4425578		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	05/16/2005	Date permi:	06/22/2005
Date 1st b:	06/22/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	72
Pump rate:	31	Bperf:	57
Static wat:	0		
	17	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING LLC PO BOX 24		
Mailing ci:	KIOWA		
Mailing st:	CO	Mailing zi:	80117-

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	736	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date permit was canceled		
Site id:	CO5000000361300		

**G23
South
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000361301

Div:	1	Wd:	2
Wdid:	209884	Receipt:	3602526B
Permitno:	64474	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	P-13
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.05		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NE
Q40:	SE	Coordsns:	2485
Coordsns d:	N	Coordsew:	572
Coordsew d:	E	Utm x:	522586.3125
Utm y:	4425578		
Loc accur:	Spotted from section lines	Permitted :	4
Use1:	INDUSTRIAL	Permitte00:	2
Use2: Use3:	MUNICIPAL	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	04/07/2006	Date permi:	06/26/2006
Date 1st b:	06/26/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	08/17/2006
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	72
Pump rate:	31	Bperf:	57
Static wat:	592		
	0	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO		
Driller li:	EXST	Mailing zi:	80401-
Date last :	07/06/2007	Pump lic:	1200
Last actio:	Record corrected		
Site id:	CO5000000361301		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

F24
NE
 1/4 - 1/2 Mile
 Lower

CO WELLS CO5000000363397

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044499
Permitno:	44499	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	E-7
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522956.90625
Utm y:	4426526		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000363397		

F25
NE
 1/4 - 1/2 Mile
 Lower

CO WELLS CO5000000363396

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0044200
Permitrpl:	44200	Permitsuf:	MH
Current st:	Not Reported	Status des:	Well Abandoned
Case no:	11	Well name:	RO-15
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SW
Coordsns d:	SW	Coordsns:	700
Coordsew d:	S	Coordsew:	1000
Utm y:	W	Utm x:	522956.90625
Loc accur:	4426526		
Use1:	User supplied	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	10/08/2004	Date permi:	10/12/2004
Date wel00:	01/06/2005	Date well :	10/28/2004
Comment :	Not Reported	Date pump :	Not Reported
Elev:	05/17/2006		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	25
Static wat:	10	Bperf:	25
	0		
	0	Full name:	EAST CHERRY CREEK VALLEY WATER & SAN
Mailing ad:	C/O LYMAN HENN 110 16TH ST STE 900		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80202-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	05/30/2006		
Last actio:	Date abandonment report received.		
Site id:	CO5000000363396		

**F26
NE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000363399

Div:	1	Wd:	2
Wdid:	206803	Receipt:	9000201
Permitno:	1068	Permitsuf:	R
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	KILKER WELL #2
Case no:	W3426	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522956.90625
Utm y:	4426526		
Loc accura:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	12/21/1959	Date permi:	12/21/1959
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	09/01/1955	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	65
Pump rate:	45	Bperf:	65
Static wat:	900		
Mailing ad:	23	Full name:	KILKER JAMES & SONS
Mailing ci:	RT 1		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601
Date last :	LR	Pump lic:	Not Reported
Last actio:	03/17/2004		
Site id:	Record corrected		
	CO5000000363399		

**F27
NE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000363398

Div:	1	Wd:	2
Wdid:	0	Receipt:	0049661
Permitno:	49661	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Well Abandoned
Current st:	11	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522956.90625

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426526	Permitted :	Q
Loc accur:	Spotted from quarters	Permitte00:	Not Reported
Use1:	OTHER	Special us:	M
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	MONITORING WELL		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	10/26/2010		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION DISTRICT
Mailing ci:	5460 S QUEBEC ST NO 110		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	Not Reported
Date last :	LIC	Pump lic:	Not Reported
	11/30/2010		
Last actio:	Date abandonment report received.		
Site id:	CO5000000363398		

**H28
SE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000361560

Div:	1	Wd:	2
Wdid:	207230	Receipt:	9000407
Permitno:	2564	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	W10152002CW351	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522962.09375
Utm y:	4425730.5		
Loc accur:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
	05/06/1960	Date permi:	05/12/1960

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	Not Reported
Date 1st b:	05/31/1954	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Mile High Duck Club aug plan.		
Elev:	0	Well depth:	71
Tperf:	0	Bperf:	0
Pump rate:	1400		
Static wat:	0	Full name:	MILE HI DUCK CLUB
Mailing ad:	1011 11TH AVENUE		
Mailing ci:	GREELEY		
Mailing st:	CO	Mailing zi:	80631-
Driller li:	LR	Pump lic:	Not Reported
Date last :	05/05/2006		
Last actio:	Change of Ownership		
Site id:	CO5000000361560		

H29
SE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000361558

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044273
Permitno:	44273	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522962.1875
Utm y:	4425730.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	11/03/2004	Date permi:	11/04/2004
Date 1st b:	02/01/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	2 WELLS		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	PEARSON LYLE
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PL		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	AUTH	Pump lic:	Not Reported
Date last :	11/04/2004		
Last actio:	Date the permit was issued.		
Site id:	CO5000000361558		

**H30
SE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000361559

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044504
Permitno:	44504	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-11, P-12
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522962.1875
Utm y:	4425730.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	2 wells		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000361559		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

F31
NE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000363116

Div:	1	Wd:	2
Wdid:	0	Receipt:	0495741
Permitno:	107531	Permitsuf:	Not Reported
Permitrpl:	A	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	14		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	480
Coordsns d:	S	Coordsew:	830
Coordsew d:	W	Utm x:	523008.90625
Utm y:	4426483		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	UPPER ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	07/18/2002	Date permi:	07/24/2002
Date 1st b:	07/24/2004	Date well :	08/02/2002
Date wel00:	Not Reported	Date pump :	08/04/2002
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	290
Pump rate:	150	Bperf:	250
Static wat:	15		
	40	Full name:	KILKER-NEWTON CATHERINE
Mailing ad:	NORAH KILKER BISHOP 443 S RACE ST		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80209-
Driller li:	1258	Pump lic:	489
Date last :	09/18/2002		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000363116		

F32
NE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000363117

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	9005047
Permitrpl:	107531	Permitsuf:	Not Reported
Current st:	Not Reported	Status des:	Well Abandoned
Case no:	11	Well name:	Not Reported
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SW
Coordsns d:	SW	Coordsns:	480
Coordsew d:	S	Coordsew:	830
Utm y:	W	Utm x:	523008.90625
Loc accur:	4426483		
Use1:	Spotted from section lines	Permitted :	8
Use2: Use3:	DOMESTIC	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	Not Reported
Permitte01:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	1		
Date appli:	acres		
Date per00:	0		
Date 1st b:	04/30/1979	Date permi:	06/15/1979
Date wel00:	Not Reported	Date well :	Not Reported
Comment :	12/30/1920	Date pump :	Not Reported
Elev:	09/12/2002		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	245
Static wat:	0	Bperf:	0
Mailing ad:	20		
Mailing ci:	0	Full name:	KILKER JAMES H/GEORGE D/MARY E
Mailing st:	21955 E 160TH AVE		
Driller li:	BRIGHTON		
Date last :	CO	Mailing zi:	80601
	LR	Pump lic:	Not Reported
	09/26/2002		
Last actio:	Date abandonment report received.		
Site id:	CO5000000363117		

**I33
ENE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000362743

Div:	1	Wd:	2
Wdid:	209886	Receipt:	0538635B
Permitno:	263893	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	P 8
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NW	Coordsns:	74
Coordsns d:	N	Coordsew:	1237
Coordsew d:	W	Utm x:	523136.6875
Utm y:	4426314.5		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	05/16/2005	Date permi:	06/22/2005
Date 1st b:	06/22/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	84
Pump rate:	34	Bperf:	69
Static wat:	0		
	13	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING LLC PO BOX 24		
Mailing ci:	KIOWA		
Mailing st:	CO	Mailing zi:	80117-
Driller li:	736	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date permit was canceled		
Site id:	CO5000000362743		

I34
ENE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000362744

Div:	1	Wd:	2
Wdid:	209886	Receipt:	3602526D
Permitno:	64476	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	P-8
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.05		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NW	Coordsns:	74
Coordsns d:	N	Coordsew:	1237
Coordsew d:	W	Utm x:	523136.6875

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426314.5	Permitted :	4
Loc accura:	Spotted from section lines	Permitte00:	2
Use1:	INDUSTRIAL	Special us:	Not Reported
Use2: Use3:	MUNICIPAL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	04/07/2006	Date permi:	06/26/2006
Date 1st b:	06/26/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	05/19/2006
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	89
Pump rate:	34	Bperf:	69
Static wat:	459		
	23	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	EXST	Pump lic:	1200
Date last :	07/06/2007		
Last actio:	Record corrected		
Site id:	CO5000000362744		

**35
WNW
1/4 - 1/2 Mile
Higher**

CO WELLS CO5000000363013

Div:	1	Wd:	2
Wdid:	0	Receipt:	0523845
Permitno:	257369	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	62		
County:	WELD		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	A	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	10		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SE
Q40:	SW	Coordsns:	350
Coordsns d:	S	Coordsew:	2440
Coordsew d:	E	Utm x:	522013.1875
Utm y:	4426438.5		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported Not
Use2: Use3:	Not Reported	Special us:	Reported LARAMIE
Aquifer2 n:	Not Reported	Aquifer1 n:	FOX HILLS
Permitte01:	Not Reported		
Permitte02:	41000		
Annual app:	SQ.FT.		
Date appli:	0		
	04/29/2004	Date permi:	06/07/2004

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	06/07/2006	Date well :	10/11/2004
Date 1st b:	Not Reported	Date pump :	10/11/2004
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	5100	Well depth:	920
Tperf:	795	Bperf:	920
Pump rate:	15		
Static wat:	493	Full name:	AUSTIN RONALD D & SHARON A
Mailing ad:	16651 WCR 12		
Mailing ci:	FT LUPTON		
Mailing st:	CO	Mailing zi:	80621-
Driller li:	698	Pump lic:	698
Date last :	04/12/2005		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000363013		

F36
NE
1/4 - 1/2 Mile
Lower

FED USGS USGS40000215380

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395926104434701		
Monloc name:	SC00106601CCB1 USGS 395926104434701		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.9905392
Longitude:	-104.7302466	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5034.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	56.9
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

	Feet below	Feet to
Date	Surface	Sealevel

1957-11-07	11.90	

J37
SSE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000361202

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	209885	Receipt:	0538635D Not
Permitrpl:	263895	Permitsuf:	Reported Permit
Current st:	Not Reported	Status des:	Canceled P 11
Case no:	8	Well name:	Not Reported
City:	Not Reported	Ogcc id:	
County:	1		
Management:	ADAMS		Not Reported
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	
Parcel siz:	Not Reported		
Pm:	0		1
Tdir:	S	Ts:	66
Rdir:	S	Rng:	12
Seca:	W	Sec:	NW
Q40:	Not Reported	Q160:	2625
Coordsns d:	SW	Coordsns:	487
Coordsew d:	N	Coordsew:	522909.1875
Utm y:	W	Utm x:	
Loc accur:	4425536.5		Q
Use1:	Spotted from section lines	Permitted :	Not Reported
Use2: Use3:	OTHER	Permitte00:	M
Aquifer2 n:	Not Reported	Special us:	QUATERNARY ALLUVIUM
Permitte01:	MONITORING WELL	Aquifer1 n:	
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		06/22/2005
Date 1st b:	05/16/2005	Date permi:	01/24/2003
Date wel00:	06/22/2007	Date well :	Not Reported
Comment :	Not Reported	Date pump :	
Elev:	Not Reported		
Tperf:	Not Reported		76
Pump rate:	0	Well depth:	61
Static wat:	29	Bperf:	
	0		
	12	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING LLC PO BOX 24		
Mailing ci:	KIOWA		
Mailing st:	CO	Mailing zi:	80117-
Driller li:	736	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date permit was canceled		
Site id:	CO5000000361202		

**J38
SSE
1/4 - 1/2 Mile
Lower**

CO WELLS

CO5000000361203

Div:	1	Wd:	2
Wdid:	209885	Receipt:	3602526C
Permitno:	64475	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	P-11
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.05		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2625
Coordsns d:	N	Coordsew:	487
Coordsew d:	W	Utm x:	522909.1875
Utm y:	4425536.5		
Loc accura:	Spotted from section lines	Permitted :	4
Use1:	INDUSTRIAL	Permitte00:	2
Use2: Use3:	MUNICIPAL	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	04/07/2006	Date permi:	06/26/2006
Date 1st b:	06/26/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	08/17/2006
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	80
Pump rate:	29	Bperf:	61
Static wat:	538		
	14	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	EXST	Pump lic:	1200
Date last :	07/06/2007		
Last actio:	Record corrected		
Site id:	CO5000000361203		

K39
NE
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000363627

Div:	1	Wd:	2
Wdid:	210019	Receipt:	0539658B
Permitno:	263943	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	E 7A
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	1075
Coordsns d:	S	Coordsew:	825
Coordsew d:	W	Utm x:	523002.8125

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426664.5	Permitted :	Q
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	OTHER	Special us:	M
Use2: Use3:	Not Reported	Aquifer1 n:	QUATERNARY ALLUVIUM
Aquifer2 n:	MONITORING WELL		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	06/09/2005	Date permi:	06/23/2005
Date 1st b:	06/23/2007	Date well :	01/24/2003
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	75
Pump rate:	39	Bperf:	60
Static wat:	0		
	16	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING INC PO BOX 24		
Mailing ci:	KIOWA		
Mailing st:	CO	Mailing zi:	80117-
Driller li:	736	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date permit was canceled		
Site id:	CO5000000363627		

**K40
NE
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000363628

Div:	1	Wd:	2
Wdid:	210019	Receipt:	3602526E
Permitno:	64477	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	E-7A
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.07		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SW	Coordsns:	1075
Coordsns d:	S	Coordsew:	825
Coordsew d:	W	Utm x:	523002.8125
Utm y:	4426664.5		
Loc accur:	Spotted from section lines	Permitted :	4
Use1:	INDUSTRIAL	Permitte00:	2
Use2: Use3:	MUNICIPAL	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	04/07/2006	Date permi:	06/26/2006

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	06/26/2007	Date well :	01/24/2003
Date 1st b:	Not Reported	Date pump :	06/14/2006
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	89
Tperf:	39	Bperf:	60
Pump rate:	1355		
Static wat:	26	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	EXST	Pump lic:	1200
Date last :	07/06/2007		
Last actio:	Record corrected		
Site id:	CO5000000363628		

**L41
South
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000360780

Div:	1	Wd:	2
Wdid:	0	Receipt:	0045424
Permitno:	45424	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	P-14
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522559.09375
Utm y:	4425325.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	08/22/2005	Date permi:	08/23/2005
Date 1st b:	11/20/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
	Not Reported		
Comment :	SPOKE WITH PAT O BRIAN & HE SAID THIS WELL WAS NEVER CONSTRUCTED. ADB 12-20-05		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	UNITED WATER
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	AUTH	Pump lic:	Not Reported
Date last :	01/04/2006		
Last actio:	Record corrected		
Site id:	CO5000000360780		

**L42
South
1/4 - 1/2 Mile
Lower**

CO WELLS CO5000000360781

Div:	1	Wd:	2
Wdid:	0	Receipt:	0045674
Permitno:	45674	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522559.09375
Utm y:	4425325.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	10/19/2005	Date permi:	10/21/2005
Date 1st b:	01/17/2006	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	1 hole to be constructed.		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
		Full name:	UNITED WATER
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80801-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	10/21/2005		
Last actio:	Date the permit was issued.		
Site id:	CO5000000360781		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

L43
South
1/4 - 1/2 Mile
Lower

CO WELLS CO5000000360782

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262I
Permitno:	10473	Permitsuf:	AD
Permitrpl:	Not Reported	Status des:	Application Denied
Current st:	3	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522559.09375
Utm y:	4425325.5		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	05/22/1984
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BRIGHTON CO
Mailing ci:	Not Reported		
Mailing st:	NORTHGLENN		
Driller li:	CO	Mailing zi:	80233
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	05/22/1984		
Site id:	Date the permit was issued. CO5000000360782		

M44
NE
1/2 - 1 Mile
Lower

CO WELLS CO5000000363549

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	210020	Receipt:	0539658C Not
Permitrpl:	263944	Permitsuf:	Reported Permit
Current st:	Not Reported	Status des:	Canceled P 6
Case no:	8	Well name:	Not Reported
City:	Not Reported	Ogcc id:	
County:	1		
Management:	ADAMS		Not Reported
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	
Parcel siz:	Not Reported		
Pm:	0		1
Tdir:	S	Ts:	66
Rdir:	S	Rng:	1
Seca:	W	Sec:	SW
Q40:	Not Reported	Q160:	940
Coordsns d:	SE	Coordsns:	1420
Coordsew d:	S	Coordsew:	523185.1875
Utm y:	W	Utm x:	
Loc accura:	4426623.5		Q
Use1:	Spotted from section lines	Permitted :	Not Reported
Use2: Use3:	OTHER	Permitte00:	M
Aquifer2 n:	Not Reported	Special us:	QUATERNARY ALLUVIUM
Permitte01:	MONITORING WELL	Aquifer1 n:	
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		06/23/2005
Date 1st b:	06/09/2005	Date permi:	01/25/2006
Date wel00:	06/23/2007	Date well :	Not Reported
Comment :	Not Reported	Date pump :	
Elev:	Not Reported		
Tperf:	Not Reported		74
Pump rate:	0	Well depth:	59
Static wat:	41	Bperf:	
	0		UNITED WATER & SANITATION DIST
	14	Full name:	
Mailing ad:	C/O D HELTON CONSULTING INC PO BOX 24		
Mailing ci:	KIOWA		
Mailing st:	CO	Mailing zi:	80117-
Driller li:	736	Pump lic:	Not Reported
Date last :	06/26/2006		
Last actio:	Date permit was canceled		
Site id:	CO5000000363549		

**M45
NE
1/2 - 1 Mile
Lower**

CO WELLS

CO5000000363550

Div:	1	Wd:	2
Wdid:	210020	Receipt:	3602526F
Permitno:	64478	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	P-6
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.07		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	SE	Coordsns:	940
Coordsns d:	S	Coordsew:	1420
Coordsew d:	W	Utm x:	523185.1875
Utm y:	4426623.5		
Loc accura:	Spotted from section lines	Permitted :	4
Use1:	INDUSTRIAL	Permitte00:	2
Use2: Use3:	MUNICIPAL	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	04/07/2006	Date permi:	06/26/2006
Date 1st b:	06/26/2007	Date well :	01/25/2006
Date wel00:	Not Reported	Date pump :	08/19/2006
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	78
Pump rate:	41	Bperf:	59
Static wat:	814		
	17	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	EXST	Pump lic:	2100
Date last :	07/06/2007		
Last actio:	Record corrected		
Site id:	CO5000000363550		

46
SSE
1/2 - 1 Mile
Lower

CO WELLS CO5000000360833

Div:	1	Wd:	2
Wdid:	0	Receipt:	0539658A
Permitno:	263942	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Not Reported
Current st:	0	Well name:	P 14
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	3282
Coordsns d:	N	Coordsew:	80
Coordsew d:	E	Utm x:	522736.59375

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4425336	Permitted :	Q
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	OTHER	Special us:	M
Use2: Use3:	Not Reported	Aquifer1 n:	QUATERNARY ALLUVIUM
Aquifer2 n:	MONITORING WELL		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	06/09/2005	Date permi:	06/23/2005
Date 1st b:	06/23/2007	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O D HELTON CONSULTING INC 24965 CR 69		
Mailing ci:	KERSEY		
Mailing st:	CO	Mailing zi:	80644-9401
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	05/08/2007		
Last actio:	Record corrected		
Site id:	CO5000000360833		

**N47
East
1/2 - 1 Mile
Lower**

CO WELLS CO5000000362311

Div:	1	Wd:	2
Wdid:	0	Receipt:	0043178A
Permitno:	43178	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	B-2
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523365.09375
Utm y:	4426135.5		
Loc accur:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	02/24/2004	Date permi:	03/02/2004

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	05/24/2004	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	no data		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	BROMLEY COMPANIES LLC
Mailing ad:	C/O ATEST INC P O BOX 262121		
Mailing ci:	HIGHLANDS RANCH		
Mailing st:	CO	Mailing zi:	80163-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	11/01/2004		
Last actio:	Record corrected		
Site id:	CO5000000362311		

N48
East
1/2 - 1 Mile
Lower

CO WELLS CO5000000362310

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044503
Permitno:	44503	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	INF-2
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523365.1875
Utm y:	4426135.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
	CO	Mailing zi:	80111-

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	AUTH	Pump lic:	Not Reported
Date last :	01/31/2005		
Last actio:	Date the permit was issued.		
Site id:	CO5000000362310		

**49
SW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000361253

Div:	1	Wd:	2
Wdid:	0	Receipt:	0531589F
Permitno:	6	Permitsuf:	GX
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	2549
Coordsns d:	N	Coordsew:	2520
Coordsew d:	W	Utm x:	521914.3125
Utm y:	4425554.5		
Loc accura:	Spotted from section lines	Permitted :	G
Use1:	GEOTHERMAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	11/02/2004	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	12/06/2004
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	300
Pump rate:	0	Bperf:	0
Static wat:	0		
		Full name:	ROCKY MOUNTAIN GOE-THERMAL INC
Mailing ad:	7790 EAST ARAPAHOE RD STE 200		
Mailing ci:	CENTENNIAL		
Mailing st:	CO	Mailing zi:	80112-
Driller li:	GT-11	Pump lic:	Not Reported
Date last :	01/11/2005		
Last actio:	Date the Well Construction and Test Report was received at DWR.		
Site id:	CO5000000361253		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

O50
NNE
 1/2 - 1 Mile
 Lower

CO WELLS CO5000000364042

Div:	1	Wd:	2
Wdid:	0	Receipt:	0050769
Permitno:	50769	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522948
Utm y:	4426905		
Loc accur:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	06/14/2012	Date permi:	06/14/2012
Date 1st b:	09/12/2012	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Two (2) holes to be constructed		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER & SANITATION DISTRICT
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	06/14/2012		
Last actio:	Date the permit was issued.		
Site id:	CO5000000364042		

O51
NNE
 1/2 - 1 Mile
 Lower

CO WELLS CO5000000364043

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	206802	Receipt:	9002561
Permitrpl:	20095	Permitsuf:	R
Current st:	Not Reported	Status des:	Well Constructed
Case no:	9	Well name:	KILKER WELL #1
City:	W3426	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SW
Coordsns d:	NW	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	522948
Loc accur:	4426905		
Use1:	Spotted from quarters	Permitted :	1
Use2: Use3:	IRRIGATION	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	Not Reported
Permitte01:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	acres		
Date per00:	0		
Date 1st b:	12/21/1959	Date permi:	12/21/1959
Date wel00:	Not Reported	Date well :	Not Reported
Comment :	04/01/1953	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	66
Static wat:	26	Bperf:	66
Mailing ad:	1697		
Mailing ci:	26	Full name:	KILKER JAMES H & JAMES M & GEORGE D
Mailing st:	RT 1		
Driller li:	BRIGHTON		
Date last :	CO	Mailing zi:	80601
Last actio:	LR	Pump lic:	Not Reported
Site id:	03/17/2004		
	Record corrected		
	CO5000000364043		

P52
SSE
1/2 - 1 Mile
Lower

FED USGS USGS40000215225

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395849104434701		
Monloc name:	SC00406612CBB1		
Monloc type:	Well		
Monloc desc:	Not Reported	Drainagearea value:	Not Reported
Huc code:	10190003	Contrib drainagearea:	Not Reported
Drainagearea Units:	Not Reported	Latitude:	39.9802616
Contrib drainagearea units:	Not Reported	Sourcemap scale:	99000
Longitude:	-104.7302467		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5041.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		
Aquifer type:	Not Reported		
Construction date:	19540101	Welldepth:	74
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

	Feet below	Feet to
Date	Surface	Sealevel

1957-12-09	27.40	

Q53
WSW
1/2 - 1 Mile
Higher

CO WELLS CO5000000361572

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262B
Permitno:	30680	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	BROMLEY LFH-04
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521750.59375
Utm y:	4425727.5		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported Not
Use2: Use3:	Not Reported	Special us:	Reported LARAMIE
Aquifer2 n:	Not Reported	Aquifer1 n:	FOX HILLS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
	02/24/1984	Date permi:	11/03/1986

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	BRIGHTON CO.
Mailing ad:	Not Reported		
Mailing ci:	NORTHGLENN		
Mailing st:	CO	Mailing zi:	80233
Driller li:	LIC	Pump lic:	Not Reported
Date last :	11/03/1987		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000361572		

Q54
WSW
1/2 - 1 Mile
Higher

CO WELLS CO5000000361573

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262E
Permitno:	30683	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	BROMLEY A-04
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521750.59375
Utm y:	4425727.5		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	02/24/1984	Date permi:	11/03/1986
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BRIGHTON CO.
Mailing ci:	Not Reported		
Mailing st:	NORTHGLENN		
	CO	Mailing zi:	80233

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	LIC	Pump lic:	Not Reported
Date last :	11/03/1987		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000361573		

55
SSW
1/2 - 1 Mile
Higher

CO WELLS CO5000000360796

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262H
Permitno:	10474	Permitsuf:	AD
Permitrpl:	Not Reported	Status des:	Application Denied
Current st:	3	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522155.59375
Utm y:	4425325.5		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	05/22/1984
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BRIGHTON CO
Mailing ci:	Not Reported		
Mailing st:	NORTHGLENN		
Driller li:	CO	Mailing zi:	80233
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	05/22/1984		
Site id:	Date the permit was issued. CO5000000360796		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

P56
SSE
1/2 - 1 Mile
Lower

CO WELLS CO5000000360774

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044514
Permitno:	44514	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-14
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	SW
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522962.6875
Utm y:	4425326		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000360774		

57
ENE
1/2 - 1 Mile
Lower

CO WELLS CO5000000363394

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0044498
Permitrpl:	44498	Permitsuf:	MH
Current st:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Case no:	5	Well name:	P-6
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SW
Coordsns d:	SE	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	523361.1875
Loc accur:	4426527		
Use1:	Spotted from quarters	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	01/27/2005	Date permi:	01/31/2005
Date wel00:	04/27/2005	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
Mailing ad:	0		
Mailing ci:	0	Full name:	UNITED WATER & SANITATION
Mailing st:	5460 S QUEBEC ST		
Driller li:	GREENWOOD VILLAGE		
Date last :	CO	Mailing zi:	80111-
Last actio:	AUTH	Pump lic:	Not Reported
Site id:	01/31/2005		
	Date the permit was issued.		
	CO5000000363394		

58
ESE
1/2 - 1 Mile
Lower

CO WELLS CO5000000361557

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044502A
Permitno:	44502	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-10
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523365.5
Utm y:	4425731.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000361557		

O59
NNE
1/2 - 1 Mile
Lower

FED USGS USGS40000215451

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395938104434601		
Monloc name:	SC00106601CBB1 USGS 395938104434601		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.9938725
Longitude:	-104.7299688	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5042.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported	Welldepth:	66
Construction date:	19550101	Wellholedepth:	Not Reported
Welldepth units:	ft		
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel

1957-12-11	23.70	

**R60
SW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360840

Div:	1	Wd:	2
Wdid:	0	Receipt:	0535565E
Permitno:	17	Permitsuf:	GX
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	2019
Coordsns d:	S	Coordsew:	2612
Coordsew d:	E	Utm x:	521964.90625
Utm y:	4425338		
Loc accura:	Spotted from section lines	Permitted :	G
Use1:	GEOHERMAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	02/25/2005
Date 1st b:	02/25/2006	Date well :	02/21/2006
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	400
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED POWER HEADQUARTERS BUILDING
Mailing ci:	500 CO-OPERATIVE WAY		
Mailing st:	BRIGHTON		
	CO	Mailing zi:	80601-

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li: GT-28 Pump lic: Not Reported
 Date last : 04/24/2006
 Last actio: Date the Well Construction and Test Report was received at DWR.
 Site id: CO5000000360840

R61
SW
1/2 - 1 Mile
Higher

CO WELLS CO5000000360841

Div:	1	Wd:	2
Wdid:	0	Receipt:	0543693B
Permitno:	3	Permitsuf:	GX
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	2019
Coordsns d:	S	Coordsew:	2612
Coordsew d:	E	Utm x:	521964.90625
Utm y:	4425338		
Loc accura:	Spotted from section lines	Permitted :	G
Use1:	GEOTHERMAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	09/16/2005	Date permi:	10/26/2005
Date 1st b:	10/20/2006	Date well :	03/27/2006
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	400
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED POWER
Mailing ci:	PO BOX 929		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601-
Date last :	GT-2	Pump lic:	Not Reported
	04/11/2006		
Last actio:	Date the Well Construction and Test Report was received at DWR.		
Site id:	CO5000000360841		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

62
SSE
1/2 - 1 Mile
Lower

CO WELLS CO5000000360410

Div:	1	Wd:	2
Wdid:	0	Receipt:	0545386
Permitno:	267228	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Not Reported
Current st:	0	Well name:	P-14
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	1388
Coordsns d:	S	Coordsew:	16
Coordsew d:	E	Utm x:	522756.40625
Utm y:	4425142		
Loc accur:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	11/02/2005	Date permi:	01/04/2006
Date 1st b:	01/04/2008	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER & SANITATION DIST
Mailing ad:	C/O HYDROKINETICS INC 12975 2 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	01/04/2006		
Last actio:	Date the permit was issued.		
Site id:	CO5000000360410		

S63
NE
1/2 - 1 Mile
Lower

CO WELLS CO5000000363799

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	210303	Receipt:	3628820
Permitrpl:	277592	Permitsuf:	Not Reported
Current st:	Not Reported	Status des:	Permit Canceled
Case no:	8	Well name:	P-5
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SW
Coordsns d:	NE	Coordsns:	1442
Coordsew d:	S	Coordsew:	1944
Utm y:	W	Utm x:	523341
Loc accur:	4426777		
Use1:	Spotted from section lines	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	05/06/2008	Date permi:	05/21/2008
Date wel00:	05/21/2010	Date well :	08/21/2008
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	ALSO SEE 277587-277593.		
Pump rate:	0	Well depth:	70
Static wat:	35	Bperf:	54
	752		
	18	Full name:	UNITED WATER & SANITATION DISTRICT
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	1200	Pump lic:	Not Reported
Date last :	05/19/2011		
Last actio:	Date permit was canceled		
Site id:	CO5000000363799		

**S64
NE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000363800

Div:	1	Wd:	2
Wdid:	210303	Receipt:	3650286D
Permitno:	75066	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	P-5
Case no:	02CW403/02CW404	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	25.03		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	NE	Coordsns:	1442
Coordsns d:	S	Coordsew:	1944
Coordsew d:	W	Utm x:	523341
Utm y:	4426777		
Loc accura:	Spotted from section lines	Permitted :	4
Use1:	INDUSTRIAL	Permitte00:	2
Use2: Use3:	MUNICIPAL	Special us:	A
Aquifer2 n:	AUGMENTED	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	05/13/2011	Date permi:	05/19/2011
Date 1st b:	05/19/2012	Date well :	08/21/2008
Date wel00:	Not Reported	Date pump :	09/09/2011
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	71
Pump rate:	0	Bperf:	0
Static wat:	595		
	16	Full name:	UNITED WATER & SANITATION DISTRICT
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	EXST	Pump lic:	878
Date last :	10/27/2011		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000363800		

**T65
SSW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360320

Div:	1	Wd:	2
Wdid:	0	Receipt:	0365204B
Permitno:	176550	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	REPLACES LR
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SW	Coordsns:	1195
Coordsns d:	S	Coordsew:	1460
Coordsew d:	E	Utm x:	522316.3125

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4425085		
Loc accur:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2:	Not Reported	Special us:	L
Use3:	ISSUED UNDER PRESUMPTION	Aquifer1 n:	UPPER ARAPAHOE
Aquifer2 n:	Not Reported		
Permitte01:	0		
Permitte02:	acres		
Annual app:	0		
Date appli:	02/04/1994	Date permi:	03/07/1994
Date per00:	03/07/1996	Date well :	03/11/1994
Date 1st b:	Not Reported	Date pump :	03/14/1994
Date wel00:	Not Reported		
Comment :	REPL;CHG SOURCE; ONLY EXEMPT* WELL ON 35+ (*IRR WELL IS #13203-R)		
Elev: Tperf:	0	Well depth:	235
Pump rate:	100	Bperf:	235
Static wat:	10		
Mailing ad:	30	Full name:	MCBRIDE WILL
Mailing ci:	2060 TELLER		
Mailing st:	LAKEWOOD		
Driller li:	CO	Mailing zi:	80215
Date last :	489	Pump lic:	489
	03/31/1994		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000360320		

**T66
SSW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360321

Div:	1	Wd:	2
Wdid:	0	Receipt:	0365204A
Permitno:	0	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Application Withdrawn
Current st:	4	Well name:	Not Reported
Case no:	Not Reported	Ogoc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SW	Coordsns:	1195
Coordsns d:	S	Coordsew:	1463
Coordsew d:	E	Utm x:	522315.3125
Utm y:	4425085		
Loc accur:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	9
Use2: Use3:	STOCK	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
	02/04/1994	Date permi:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	MCBRIDE WILL
Mailing ad:	2060 TELLER		
Mailing ci:	LAKEWOOD		
Mailing st:	CO	Mailing zi:	80215
Driller li:	LR	Pump lic:	Not Reported
Date last :	02/04/1994		
Last actio:	Date application received at DWR.		
Site id:	CO5000000360321		

67
West
1/2 - 1 Mile
Higher

CO WELLS CO5000000362707

Div:	1	Wd:	2
Wdid:	0	Receipt:	9004441
Permitno:	77100	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NW
Q40:	NW	Coordsns:	115
Coordsns d:	N	Coordsew:	1114
Coordsew d:	W	Utm x:	521481.1875
Utm y:	4426293.5		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
Date per00:	10/07/1974	Date permi:	10/17/1974
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	06/01/1956	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	PARKER ROGER J
Mailing ci:	20400 E 160TH AVENUE		
Mailing st:	BRIGHTON		
	CO	Mailing zi:	80601

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	Not Reported	Pump lic:	Not Reported
Date last :	01/28/2010		
Last actio:	Change of Ownership		
Site id:	CO5000000362707		

**68
NE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364252

Div:	1	Wd:	2
Wdid:	210302	Receipt:	3628819
Permitno:	277591	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	P-4
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	2341
Coordsns d:	S	Coordsew:	1441
Coordsew d:	W	Utm x:	523180.8125
Utm y:	4427050.5		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	05/06/2008	Date permi:	05/21/2008
Date 1st b:	05/21/2010	Date well :	09/09/2008
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	ALSO SEE 277587-277593.		
Tperf:	0	Well depth:	78
Pump rate:	35	Bperf:	61
Static wat:	1200		
	9	Full name:	UNITED WATER & SANITATION DISTRICT
Mailing ad:	C/O HYDROKINETICS INC 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	1200	Pump lic:	Not Reported
Date last :	05/19/2011		
Last actio:	Date permit was canceled		
Site id:	CO5000000364252		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

U69
NE
 1/2 - 1 Mile
 Lower

CO WELLS CO5000000364051

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044497
Permitno:	44497	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-5
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SW
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523353.90625
Utm y:	4426906.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000364051		

U70
NE
 1/2 - 1 Mile
 Lower

CO WELLS CO5000000364052

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0244018P
Permitrpl:	10609	Permitsuf:	AD
Current st:	Not Reported	Status des:	Application Denied
Case no:	3	Well name:	Not Reported
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	0	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SW
Coordsns d:	NE	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	523353.90625
Loc accur:	4426906.5		
Use1:	Spotted from quarters	Permitted :	2
Use2: Use3:	MUNICIPAL	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	Not Reported
Permitte01:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	acres		
Date per00:	0		
Date 1st b:	Not Reported	Date permi:	10/29/1984
Date wel00:	Not Reported	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
Mailing ad:	0		
Mailing ci:	0	Full name:	FARMERS RESERVOIR & IRR
Mailing st:	Not Reported		
Driller li:	BRIGHTON		
Date last :	CO	Mailing zi:	80601
Last actio:	Not Reported	Pump lic:	Not Reported
Site id:	02/28/1994		
	Record corrected		
	CO5000000364052		

**V71
North
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364623

Div:	1	Wd:	2
Wdid:	0	Receipt:	0403096B
Permitno:	14010	Permitsuf:	AD
Permitrpl:	Not Reported	Status des:	Application Denied
Current st:	3	Well name:	LOCHBUIE A
Case no:	93CW0150	Ogcc id:	Not Reported
City:	1		
County:	ADAMS	Manageme00:	Not Reported
Management:	0	Designat00:	Not Reported
Designated:	0	Filing:	Not Reported
Subdivisio:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2000
Coordsns d:	N	Coordsew:	100
Coordsew d:	W	Utm x:	522767.09375
Utm y:	4427242.5		
Loc accura:	Spotted from section lines	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	LOWER ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	07/03/1996	Date permi:	12/02/1996
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BEEBE DRAW WATER & SANITATION DIST
Mailing ci:	1610 WYNKOOP ST #550		
Mailing st:	DENVER		
Driller li:	CO	Mailing zi:	80202
Date last :	LIC	Pump lic:	Not Reported
Last actio:	02/03/1997		
Site id:	Record corrected CO5000000364623		

V72
North
1/2 - 1 Mile
Higher

CO WELLS CO5000000364624

Div:	1	Wd:	2
Wdid:	0	Receipt:	0433443B
Permitno:	50642	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Not Reported
Current st:	0	Well name:	LOCHBUIE A1
Case no:	93CW0150	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2000
Coordsns d:	N	Coordsew:	100
Coordsew d:	W	Utm x:	522767.09375

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4427242.5		
Loc accura:	Spotted from section lines	Permitted :	1
Use1:	IRRIGATION	Permitte00:	2
Use2:	MUNICIPAL	Special us:	5
Use3:	ISSUED PURSUANT TO SB5 --13741	Water 1 n:	LOWER DAWSON
Aquifer2 n:	Not Reported		
Permitte01:	0		
Permitte02:	acres		
Annual app:	0		
Date appli:	07/22/1998	Date permi:	09/25/1998
Date per00:	09/25/1999	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	BEEBE DRAW WATER & SANITATION DIST
Mailing ad:	1610 WYNKOOP ST #550		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80202
Driller li:	LIC	Pump lic:	Not Reported
Date last :	09/25/1998		
Last actio:	Date the permit was issued.		
Site id:	CO5000000364624		

**V73
NNE
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364628

Div:	1	Wd:	2
Wdid:	0	Receipt:	0433443A
Permitno:	50641	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Not Reported
Current st:	0	Well name:	Not Reported
Case no:	93CW0150	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2000
Coordsns d:	N	Coordsew:	150
Coordsew d:	W	Utm x:	522782.3125
Utm y:	4427243		
Loc accura:	Spotted from section lines	Permitted :	1
Use1:	IRRIGATION	Permitte00:	2
Use2:	MUNICIPAL	Special us:	5
Use3:	ISSUED PURSUANT TO SB5 --13741	Water 1 n:	LARAMIE FOX HILLS
Aquifer2 n:	Not Reported		
Permitte01:	0		
Permitte02:	acres		
Annual app:	0		
Date appli:	07/22/1998	Date permi:	09/25/1998

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	09/25/1999	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	BEEBE DRAW WATER & SANITATION DIST
Mailing ad:	1610 WYNKOOP ST #550		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80202
Driller li:	LIC	Pump lic:	Not Reported
Date last :	09/25/1998		
Last actio:	Date the permit was issued.		
Site id:	CO5000000364628		

**V74
NNE
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364627

Div:	1	Wd:	2
Wdid:	0	Receipt:	0403096A
Permitno:	14011	Permitsuf:	AD
Permitrpl:	Not Reported	Status des:	Application Denied
Current st:	3	Well name:	LOCHBUIE LFH 1
Case no:	93CW0150	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2000
Coordsns d:	N	Coordsew:	150
Coordsew d:	W	Utm x:	522782.3125
Utm y:	4427243		
Loc accura:	Spotted from section lines	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported Not
Use2: Use3:	Not Reported	Special us:	Reported LARAMIE
Aquifer2 n:	Not Reported	Aquifer1 n:	FOX HILLS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	07/03/1996	Date permi:	12/02/1996
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BEEBE DRAW WATER & SANITATION DIST
Mailing ci:	1610 WYNKOOP ST #550		
Mailing st:	DENVER		
	CO	Mailing zi:	80202

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	LIC	Pump lic:	Not Reported
Date last :	02/03/1997		
Last actio:	Record corrected		
Site id:	CO5000000364627		

**V75
NNE
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364630

Div:	1	Wd:	2
Wdid:	209407	Receipt:	0403096D
Permitno:	47837	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	BDWSD 1 KA
Case no:	93CW0150	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2000
Coordsns d:	N	Coordsew:	150
Coordsew d:	W	Utm x:	522782.3125
Utm y:	4427243		
Loc accura:	Spotted from section lines	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2:	Not Reported	Special us:	5
Use3:	ISSUED PURSUANT TO SB5 --13741	Water n:	LOWER ARAPAHOE
Aquifer2 n:	Not Reported		
Permitte01:	0		
Permitte02:	acres		
Annual app:	0		
Date appli:	07/03/1996	Date permi:	02/03/1997
Date per00:	02/03/1998	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	BEEBE DRAW WATER & SAN DIST
Mailing ad:	1610 WYNKOOP ST STE 550		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80202
Driller li:	LIC	Pump lic:	Not Reported
Date last :	09/24/1998		
Last actio:	Date permit was canceled		
Site id:	CO5000000364630		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

V76 NNE 1/2 - 1 Mile Higher		CO WELLS CO5000000364629	
Div:	1	Wd:	2
Wdid:	209401	Receipt:	0403096C
Permitno:	47836	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Canceled
Current st:	8	Well name:	BDWSD 1 LFH
Case no:	93CW0150	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	2000
Coordsns d:	N	Coordsew:	150
Coordsew d:	W	Utm x:	522782.3125
Utm y:	4427243		
Loc accura:	Spotted from section lines	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2:	Not Reported	Special us:	5
Use3:	ISSUED PURSUANT TO SB5 --13701	Aquifer1 n:	LARAMIE FOX HILLS
Aquifer2 n:	Not Reported		
Permitte01:	0		
Permitte02:	acres		
Annual app:	0		
Date appli:	07/03/1996	Date permi:	02/03/1997
Date per00:	02/03/1998	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	BEEBE DRAW WATER & SAN DIST
Mailing ad:	1610 WYNKOOP ST STE 550		
Mailing ci:	DENVER		
Mailing st:	CO	Mailing zi:	80202
Driller li:	LIC	Pump lic:	Not Reported
Date last :	09/24/1998		
Last actio:	Date permit was canceled		
Site id:	CO5000000364629		

77
West
1/2 - 1 Mile
Higher

CO WELLS **CO5000000362142**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	206347	Receipt:	9001639
Permitrpl:	12426	Permitsuf:	R
Current st:	Not Reported	Status des:	Well Constructed
Case no:	9	Well name:	Not Reported
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	11
Q40:	Not Reported	Q160:	SE
Coordsns d:	SE	Coordsns:	748
Coordsew d:	N	Coordsew:	822
Utm y:	W	Utm x:	521393.40625
Loc accur:	4426100		
Use1:	Spotted from section lines	Permitted :	1
Use2: Use3:	IRRIGATION	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	Not Reported
Permitte01:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	acres		
Date per00:	0		
Date 1st b:	04/25/1960	Date permi:	04/25/1960
Date wel00:	Not Reported	Date well :	Not Reported
Comment :	08/01/1947	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	55
Static wat:	0	Bperf:	0
	1450		
	25	Full name:	70 RANCH LLC
Mailing ad:	8301 E PRENTICE AVENUE #100		
Mailing ci:	GREENWOOD VILLAGE		
Mailing st:	CO	Mailing zi:	80111-
Driller li:	LR	Pump lic:	Not Reported
Date last :	06/21/2011		
Last actio:	Change of Ownership		
Site id:	CO5000000362142		

**W78
ESE
1/2 - 1 Mile
Lower**

CO WELLS

CO5000000361187

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010220
Permitno:	220	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	Not Reported
Q40:	Not Reported	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523568.09375
Utm y:	4425529.5		
Loc accura:	Spotted from quarters	Permitted :	Not Reported
Use1:	Not Reported	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	03/02/1955
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	42
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	GREEN K B
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
Driller li:	Not Reported	Mailing zi:	Not Reported
Date last :	1	Pump lic:	Not Reported
Last actio:	03/02/1955		
Site id:	Date the permit was issued. CO5000000361187		

W79
ESE
1/2 - 1 Mile
Lower

CO WELLS CO5000000361186

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010200
Permitno:	200	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	Not Reported
Q40:	Not Reported	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523568.09375

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4425529.5	Permitted :	Not Reported
Loc accur:	Spotted from quarters	Permitte00:	Not Reported
Use1:	Not Reported	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	11/04/1954
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	70
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	MILE HI DUCK CLUB
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
Driller li:	Not Reported	Mailing zi:	Not Reported
Date last :	1	Pump lic:	Not Reported
Last actio:	11/04/1954		
Site id:	Date the permit was issued. CO500000361186		

**W80
ESE
1/2 - 1 Mile
Lower**

CO WELLS CO500000361188

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010221
Permitno:	221	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	Not Reported
Q40:	Not Reported	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523568.09375
Utm y:	4425529.5		
Loc accur:	Spotted from quarters	Permitted :	Not Reported
Use1:	Not Reported	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	Not Reported	Date permi:	03/02/1955

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	52
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	GREEN K B
Mailing ad:	Not Reported		
Mailing ci:	Not Reported		
Mailing st:	Not Reported	Mailing zi:	Not Reported
Driller li:	1	Pump lic:	Not Reported
Date last :	03/02/1955		
Last actio:	Date the permit was issued.		
Site id:	CO5000000361188		

**W81
ESE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000361190

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010247
Permitno:	247	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	Not Reported
Q40:	Not Reported	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523568.09375
Utm y:	4425529.5		
Loc accura:	Spotted from quarters	Permitted :	Not Reported
Use1:	Not Reported	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	07/05/1955
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	40
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	TRACY L F
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
	Not Reported	Mailing zi:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	1	Pump lic:	Not Reported
Date last :	07/05/1955		
Last actio:	Date the permit was issued.		
Site id:	CO5000000361190		

**W82
ESE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000361189

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010232
Permitno:	232	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	Not Reported
Q40:	Not Reported	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523568.09375
Utm y:	4425529.5		
Loc accura:	Spotted from quarters	Permitted :	Not Reported
Use1:	Not Reported	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	03/28/1955
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	160
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	TRACY L F
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
Driller li:	Not Reported	Mailing zi:	Not Reported
Date last :	1	Pump lic:	Not Reported
Last actio:	03/28/1955		
Site id:	Date the permit was issued. CO5000000361189		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

X83
South
1/2 - 1 Mile
Lower

CO WELLS CO5000000360063

Div:	1	Wd:	2
Wdid:	0	Receipt:	3606232
Permitno:	270098	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	27.5		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	680
Coordsns d:	S	Coordsew:	504
Coordsew d:	E	Utm x:	522607.90625
Utm y:	4424927		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	.5		
Annual app:	ACRES		
Date appli:	0		
Date per00:	07/11/2006	Date permi:	08/04/2006
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	12/31/1947	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	60
Pump rate:	0	Bperf:	0
Static wat:	15		
	0	Full name:	70 RANCH LLC
Mailing ad:	8301 E PRENTICE AVENUE #100		
Mailing ci:	GREENWOOD VILLAGE		
Mailing st:	CO	Mailing zi:	80111-
Driller li:	LR	Pump lic:	Not Reported
Date last :	06/21/2011		
Last actio:	Change of Ownership		
Site id:	CO5000000360063		

X84
South
1/2 - 1 Mile
Lower

CO WELLS CO5000000360011

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0043180
Permitrpl:	43180	Permitsuf:	MH
Current st:	Not Reported	Status des:	Permit Expired
Case no:	7	Well name:	D-3
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	11
Q40:	Not Reported	Q160:	SE
Coordsns d:	SE	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	522559.8125
Loc accur:	4424921.5		
Use1:	Spotted from quarters	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	02/24/2004	Date permi:	03/02/2004
Date wel00:	05/24/2004	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	no data		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
	0		
	0	Full name:	BROMLEY COMPANIES LLC
Mailing ad:	C/O ATEST INC P O BOX 262121		
Mailing ci:	HIGHLANDS RANCH		
Mailing st:	CO	Mailing zi:	80163-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	11/01/2004		
Last actio:	Record corrected		
Site id:	CO5000000360011		

**X85
South
1/2 - 1 Mile
Lower**

CO WELLS CO5000000360012

Div:	1	Wd:	2
Wdid:	0	Receipt:	9001115
Permitno:	8662	Permitsuf:	R
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522559.8125
Utm y:	4424921.5		
Loc accura:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	07/01/1954	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	71
Pump rate:	0	Bperf:	0
Static wat:	1700		
Mailing ad:	18	Full name:	MILE HIGH DUCK CLUB
Mailing ci:	1010 MILE HI CNTR		
Mailing st:	DENVER 2		
Driller li:	CO	Mailing zi:	80202
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	07/01/1954		
Site id:	Date of first beneficial use. CO5000000360012		

**X86
South
1/2 - 1 Mile
Lower**

CO WELLS CO5000000360009

Div:	1	Wd:	2
Wdid:	0	Receipt:	0051329
Permitno:	51329	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522559.90625

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4424921.5	Permitted :	Q
Loc accur:	Spotted from quarters	Permitte00:	Not Reported
Use1:	OTHER	Special us:	M
Use2: Use3:	Not Reported	Aquifer1 n:	QUATERNARY ALLUVIUM
Aquifer2 n:	MONITORING WELL		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	03/11/2013	Date permi:	03/12/2013
Date 1st b:	06/09/2013	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Three (3) holes to be constructed		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER & SANITATION DISTRICT
Mailing ad:	C/O CIVIL RESOURCES LLC 323 FIFTH STREET		
Mailing ci:	FREDERICK		
Mailing st:	CO	Mailing zi:	80530-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	03/12/2013		
Last actio:	Date the permit was issued.		
Site id:	CO5000000360009		

**X87
South
1/2 - 1 Mile
Lower**

CO WELLS CO5000000360010

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010223
Permitno:	223	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522559.90625
Utm y:	4424921.5		
Loc accur:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	Not Reported	Date permi:	03/15/1955

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	64
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	MCMORROW JAMES J
Mailing ad:	Not Reported		
Mailing ci:	Not Reported		
Mailing st:	Not Reported	Mailing zi:	Not Reported
Driller li:	1	Pump lic:	Not Reported
Date last :	03/15/1955		
Last actio:	Date the permit was issued.		
Site id:	CO5000000360010		

X88
South
1/2 - 1 Mile
Lower

FED USGS USGS40000215165

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395834104440201		
Monloc name:	SC00106611DDB1 USGS 395834104440201		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.976095
Longitude:	-104.7344136	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5050.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		
Aquifer type:	Not Reported		
Construction date:	19470101	Welldepth:	55.5
Welldepth units:	ft	Wellholeddepth:	Not Reported
Wellholeddepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

	Feet below	Feet to
Date	Surface	Sealevel

1957-08-28	16.00	

Y89
East
1/2 - 1 Mile
Lower

CO WELLS CO5000000362306

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0044500
Permitrpl:	44500	Permitsuf:	MH
Current st:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Case no:	5	Well name:	P-16
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	12
Q40:	Not Reported	Q160:	NE
Coordsns d:	NW	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	523768.59375
Loc accur:	4426136.5		
Use1:	Spotted from quarters	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	01/27/2005	Date permi:	01/31/2005
Date wel00:	04/27/2005	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
Mailing ad:	0		
Mailing ci:	0	Full name:	UNITED WATER & SANITATION
Mailing st:	5460 S QUEBEC ST		
Driller li:	GREENWOOD VILLAGE		
Date last :	CO	Mailing zi:	80111-
Last actio:	AUTH	Pump lic:	Not Reported
Site id:	01/31/2005		
	Date the permit was issued.		
	CO5000000362306		

**90
NNE
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364711

Div:	1	Wd:	2
Wdid:	206902	Receipt:	0383110G
Permitno:	45268	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	WELL #7
Case no:	92CW0013	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SW	Coordsns:	3050
Coordsns d:	S	Coordsew:	900
Coordsew d:	W	Utm x:	523010.40625
Utm y:	4427266		
Loc accura:	Spotted from section lines	Permitted :	1
Use1:	IRRIGATION	Permitte00:	3
Use2: Use3:	COMMERCIAL	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	03/29/1995	Date permi:	07/28/1995
Date 1st b:	07/28/1996	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	49792-F		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	ROGERS JACK
Mailing ad:	C/O KIM LAWRENCE 1011 ELEVENTH AVE		
Mailing ci:	GREELEY		
Mailing st:	CO	Mailing zi:	80631
Driller li:	EXST	Pump lic:	Not Reported
Date last :	04/15/1998		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000364711		

Z91
South
1/2 - 1 Mile
Lower

FED USGS USGS40000215160

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395833104441201		
Monloc name:	SC00106611DCA1 USGS 395833104441201		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.9758172
Longitude:	-104.7371915	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5050.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported	Welldepth:	55
Construction date:	19230101	Wellholedepth:	Not Reported
Welldepth units:	ft		
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel

1957-12-09	25.20	

**Y92
East
1/2 - 1 Mile
Lower**

CO WELLS CO5000000362024

Div:	1	Wd:	2
Wdid:	208380	Receipt:	9004189
Permitno:	62096	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NE
Q40:	NW	Coordsns:	977
Coordsns d:	N	Coordsew:	1900
Coordsew d:	E	Utm x:	523794.59375
Utm y:	4426040.5		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	9
Use2: Use3:	STOCK	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
Date per00:	05/03/1972	Date permi:	07/05/1972
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	03/15/1954	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	TRACY ALMA L
Mailing ci:	23100 E 160TH AVE		
Mailing st:	BRIGHTON		
	CO	Mailing zi:	80601

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	LR	Pump lic:	Not Reported
Date last :	08/19/2004		
Last actio:	Record corrected		
Site id:	CO5000000362024		

**AA93
SSW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360031

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010231
Permitno:	231	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522157
Utm y:	4424923		
Loc accura:	Spotted from quarters	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	03/28/1955
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	64
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BAKER L F
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
Driller li:	Not Reported	Mailing zi:	Not Reported
Date last :	1	Pump lic:	Not Reported
Last actio:	03/28/1955		
Site id:	Date the permit was issued. CO5000000360031		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

AA94
SSW
1/2 - 1 Mile
Higher

CO WELLS CO5000000360032

Div:	1	Wd:	2
Wdid:	205313	Receipt:	9001748
Permitno:	13203	Permitsuf:	R
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522156.90625
Utm y:	4424923		
Loc accura:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	11/30/1937	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	55
Pump rate:	0	Bperf:	0
Static wat:	1000		
Mailing ad:	27	Full name:	MCBRIDE WILL
Mailing ci:	21251 E 152ND AVE		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	06/08/1994		
Site id:	Record corrected		
	CO5000000360032		

AB95
SSE
1/2 - 1 Mile
Lower

CO WELLS CO5000000360006

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	9001283
Permitrpl:	9912	Permitsuf:	Not Reported
Current st:	Not Reported	Status des:	Well Constructed
Case no:	9	Well name:	Not Reported
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	0	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	12
Q40:	Not Reported	Q160:	SW
Coordsns d:	SW	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	522963.09375
Loc accur:	4424922		
Use1:	Spotted from quarters	Permitted :	8
Use2: Use3:	DOMESTIC	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	Not Reported
Permitte01:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported	Date permi:	Not Reported
Date per00:	1	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	10/05/1961		
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	138
Static wat:	0	Bperf:	0
Mailing ad:	28		
Mailing ci:	20	Full name:	STINNETT VICTOR
Mailing st:	RT 1		
Driller li:	BRIGHTON		
Date last :	CO	Mailing zi:	80601
Last actio:	Not Reported	Pump lic:	Not Reported
Site id:	07/18/2007		
	Record corrected		
	CO5000000360006		

**AC96
NW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364170

Div:	1	Wd:	2
Wdid:	0	Receipt:	0458400A
Permitno:	225365	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	MITCHELL	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	3	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	2.5		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SW
Q40:	NE	Coordsns:	2180
Coordsns d:	S	Coordsew:	1530
Coordsew d:	W	Utm x:	521607.8125
Utm y:	4426994		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	LOWER ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	5000		
Annual app:	SQ.FT.		
Date appli:	0		
Date per00:	03/27/2000	Date permi:	05/01/2000
Date 1st b:	05/01/2002	Date well :	06/29/2001
Date wel00:	Not Reported	Date pump :	08/23/2001
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	455
Pump rate:	315	Bperf:	455
Static wat:	12		
Mailing ad:	165	Full name:	MITCHELL CHARLES R & MARY
Mailing ci:	14001 BURLINGTON BLVD		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601-
Date last :	1149	Pump lic:	1149
	09/06/2001		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000364170		

Z97
South
1/2 - 1 Mile
Higher

CO WELLS CO5000000359799

Div:	1	Wd:	8
Wdid:	0	Receipt:	3651731
Permitno:	70980	Permitsuf:	Not Reported
Permitrpl:	A	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	FURUTA	Filing:	Not Reported
Lot:	1	Block:	2
County par:	Not Reported		
Parcel siz:	2.75		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	330
Coordsns d:	S	Coordsew:	1060
Coordsew d:	E	Utm x:	522438.59375

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4424821		
Loc accur:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	LOWER ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	1		
Annual app:	ACRES		
Date appli:	0		
Date per00:	08/04/2011	Date permi:	08/04/2011
Date 1st b:	08/04/2013	Date well :	10/21/2011
Date wel00:	Not Reported	Date pump :	10/24/2011
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	5050	Well depth:	420
Pump rate:	320	Bperf:	420
Static wat:	14		
Mailing ad:	35	Full name:	HERRERA LOUIS A
Mailing ci:	21351 E 152ND		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80603-
Date last :	1229	Pump lic:	1229
	12/22/2011		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000359799		

**Z98
South
1/2 - 1 Mile
Higher**

CO WELLS CO5000000359800

Div:	1	Wd:	2
Wdid:	0	Receipt:	9004354
Permitno:	70980	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	330
Coordsns d:	S	Coordsew:	1060
Coordsew d:	E	Utm x:	522438.5
Utm y:	4424821		
Loc accur:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
	08/08/1973	Date permi:	08/27/1973

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	03/01/1974
Date 1st b:	03/28/1974	Date pump :	03/28/1974
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	30	Full name:	FURUTA KAZUMI
Mailing ad:	RT 1 BOX 287		
Mailing ci:	BRIGHTON		
Mailing st:	CO	Mailing zi:	80601
Driller li:	179	Pump lic:	179
Date last :	02/11/2005		
Last actio:	Record corrected		
Site id:	CO5000000359800		

99
East
1/2 - 1 Mile
Lower

CO WELLS CO5000000362025

Div:	1	Wd:	2
Wdid:	208379	Receipt:	9004188
Permitno:	62095	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	NE
Q40:	NW	Coordsns:	977
Coordsns d:	N	Coordsew:	1650
Coordsew d:	E	Utm x:	523870.8125
Utm y:	4426041		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
Date per00:	05/03/1972	Date permi:	07/05/1972
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	06/25/1955	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	TRACY ALMA L
Mailing ci:	23100 E 160TH AVE		
Mailing st:	BRIGHTON		
	CO	Mailing zi:	80601

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	LR	Pump lic:	Not Reported
Date last :	08/19/2004		
Last actio:	Record corrected		
Site id:	CO5000000362025		

**AC100
NW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364166

Div:	1	Wd:	2
Wdid:	0	Receipt:	0458400B
Permitno:	225364	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	MITCHELL	Filing:	Not Reported
Lot:	2	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	2.9		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SW
Q40:	NE	Coordsns:	2180
Coordsns d:	S	Coordsew:	1185
Coordsew d:	W	Utm x:	521502.59375
Utm y:	4426993		
Loc accura:	Spotted from section lines	Permitted :	8
Use1:	DOMESTIC	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	LOWER ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	5000		
Annual app:	SQ.FT.		
Date appli:	0		
Date per00:	03/27/2000	Date permi:	05/01/2000
Date 1st b:	05/01/2003	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	MITCHELL CHARLES R & MARY
Mailing ci:	14001 BURLINGTON BLVD		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601-
Date last :	LIC	Pump lic:	Not Reported
	03/30/2009		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000364166		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

AD101
NE
 1/2 - 1 Mile
 Lower

CO WELLS CO5000000364591

Div:	1	Wd:	2
Wdid:	0	Receipt:	0532595B
Permitno:	260932	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	MH-#1
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	2054
Coordsns d:	N	Coordsew:	1997
Coordsew d:	W	Utm x:	523345.6875
Utm y:	4427229		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	12/06/2004	Date permi:	12/20/2004
Date 1st b:	12/20/2006	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED EATER & SANITATION DISTRICT
Mailing ad:	C/O D HELTON CONSULTING LLC 24965 CR 69		
Mailing ci:	KERSEY		
Mailing st:	CO	Mailing zi:	80644-9401
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	11/07/2006		
Last actio:	Record corrected		
Site id:	CO5000000364591		

AB102
SSE
 1/2 - 1 Mile
 Lower

CO WELLS CO5000000359765

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	9004843
Permitrpl:	95931	Permitsuf:	Not Reported
Current st:	Not Reported	Status des:	Well Constructed
Case no:	9	Well name:	BALL #1
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	12
Q40:	Not Reported	Q160:	SW
Coordsns d:	SW	Coordsns:	300
Coordsew d:	S	Coordsew:	600
Utm y:	W	Utm x:	522944.59375
Loc accur:	4424811		
Use1:	Spotted from section lines	Permitted :	8
Use2:	DOMESTIC	Permitte00:	9
	STOCK	Special us:	L
Use3:	ISSUED UNDER PRESUMPTION	Aquifer 1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	0		
Permitte02:	acres		
Annual app:	0		
Date appli:	06/27/1977	Date permi:	01/03/1978
Date per00:	01/03/1980	Date well :	11/30/1979
Date 1st b:	11/30/1979	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	200
Tperf:	0	Bperf:	0
Pump rate:	15		
Static wat:	60	Full name:	BLOCKER CURT
Mailing ad:	21855 E 152ND AVE		
Mailing ci:	BRIGHTON		
Mailing st:	CO	Mailing zi:	80601
Driller li:	503	Pump lic:	Not Reported
Date last :	12/02/2005		
Last actio:	Record corrected		
Site id:	CO5000000359765		

**AE103
NE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364333

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010272
Permitno:	272	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	Not Reported
Q40:	Not Reported	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523552.40625
Utm y:	4427091.5		
Loc accura:	Spotted from quarters	Permitted :	Not Reported
Use1:	Not Reported	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	01/06/1956
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	74
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	KILKER JAMES M
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
Driller li:	Not Reported	Mailing zi:	Not Reported
Date last :	1	Pump lic:	Not Reported
Last actio:	01/06/1956		
Site id:	Date the permit was issued. CO5000000364333		

**104
West
1/2 - 1 Mile
Higher**

CO WELLS CO5000000362111

Div:	1	Wd:	2
Wdid:	205697	Receipt:	9001749
Permitno:	13205	Permitsuf:	R
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	NE
Q40:	NE	Coordsns:	794
Coordsns d:	N	Coordsew:	27
Coordsew d:	W	Utm x:	521151.3125

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4426084.5	Permitted :	1
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	IRRIGATION	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	80		
Annual app:	ACRES		
Date appli:	0		
Date per00:	04/29/1960	Date permi:	04/29/1960
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	07/31/1954	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	63
Pump rate:	33	Bperf:	63
Static wat:	1000		
Mailing ad:	20	Full name:	CAW EQUITIES LLC
Mailing ci:	8301 E PRENTICE AVE #100		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	LR	Pump lic:	Not Reported
Last actio:	04/05/2012		
Site id:	Change of Ownership		
	CO5000000362111		

**AD105
NE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364808

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044511
Permitno:	44511	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-15
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523346.59375
Utm y:	4427285.5		
Loc accur:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	01/27/2005	Date permi:	01/31/2005

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	04/27/2005	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	UNITED WATER & SANITATION
Mailing ad:	5460 S QUEBEC ST		
Mailing ci:	GREENWOOD VILLAGE		
Mailing st:	CO	Mailing zi:	80111-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	01/31/2005		
Last actio:	Date the permit was issued.		
Site id:	CO5000000364808		

**AF106
NW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364804

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262C
Permitno:	30681	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	BROMLEY LFH-02
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521739.1875
Utm y:	4427279.5		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported Not
Use2: Use3:	Not Reported	Special us:	Reported LARAMIE
Aquifer2 n:	Not Reported	Aquifer1 n:	FOX HILLS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	02/24/1984	Date permi:	11/03/1986
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BRIGHTON CO.
Mailing ci:	Not Reported		
Mailing st:	NORTHGLENN		
	CO	Mailing zi:	80233

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	LIC	Pump lic:	Not Reported
Date last :	11/03/1987		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000364804		

**AF107
NW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000364805

Div:	1	Wd:	2
Wdid:	0	Receipt:	0243262F
Permitno:	30684	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	BROMLEY A-02
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521739.1875
Utm y:	4427279.5		
Loc accura:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ARAPAHOE
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	02/24/1984	Date permi:	11/03/1986
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BRIGHTON CO.
Mailing ci:	Not Reported		
Mailing st:	NORTHGLENN		
Driller li:	CO	Mailing zi:	80233
Date last :	LIC	Pump lic:	Not Reported
	11/03/1987		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000364805		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

108
NNE
1/2 - 1 Mile
Lower

CO WELLS CO5000000365024

Div:	1	Wd:	2
Wdid:	206059	Receipt:	0112178A
Permitno:	9381	Permitsuf:	F
Permitrpl:	R	Status des:	Well Constructed
Current st:	9	Well name:	EPPINGER WELL #1
Case no:	W2782	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	1400
Coordsns d:	N	Coordsew:	1400
Coordsew d:	W	Utm x:	523158.6875
Utm y:	4427427.5		
Loc accura:	Spotted from section lines	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	10/17/1979	Date permi:	02/21/1981
Date 1st b:	02/21/1982	Date well :	05/04/1981
Date wel00:	Not Reported	Date pump :	05/11/1981
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	62
Pump rate:	42	Bperf:	62
Static wat:	0		
Mailing ad:	0	Full name:	EPPINGER W H
Mailing ci:	5800 E 112 AVE		
Mailing st:	DENVER		
Driller li:	CO	Mailing zi:	80229
Date last :	513	Pump lic:	513
Last actio:	07/06/2010		
Site id:	Record corrected CO5000000365024		

AG109
SSW
1/2 - 1 Mile
Higher

CO WELLS CO5000000360060

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0044764
Permitrpl:	44764	Permitsuf:	MH
Current st:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Case no:	5	Well name:	TW-6
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	11
Q40:	Not Reported	Q160:	SW
Coordsns d:	SE	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	521754.09375
Loc accur:	4424924.5		
Use1:	Spotted from quarters	Permitted :	Q
Use2: Use3:	OTHER	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	M
Permitte01:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	Not Reported		
Date per00:	0		
Date 1st b:	04/01/2005	Date permi:	04/04/2005
Date wel00:	06/30/2005	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
	0		
	0	Full name:	LEMKE BOB
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PLACE		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	04/04/2005		
Last actio:	Date the permit was issued.		
Site id:	CO5000000360060		

**AG110
SSW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360061

Div:	1	Wd:	2
Wdid:	0	Receipt:	0048665
Permitno:	48665	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521754.09375
Utm y:	4424924.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	QUATERNARY ALLUVIUM
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	06/22/2009	Date permi:	06/22/2009
Date 1st b:	09/20/2009	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Three (3) holes to be constructed		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	BRIGHTON FEED & SADDLERY
Mailing ad:	C/O CANFIELD DRILLING CO PO BOX 519		
Mailing ci:	FORT MORGAN		
Mailing st:	CO	Mailing zi:	80701-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	06/22/2009		
Last actio:	Date the permit was issued.		
Site id:	CO5000000360061		

AG111
SSW
1/2 - 1 Mile
Higher

CO WELLS CO5000000360062

Div:	1	Wd:	2
Wdid:	0	Receipt:	C010210
Permitno:	210	Permitsuf:	WCB
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521754.09375

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4424924.5	Permitted :	1
Loc accur:	Spotted from quarters	Permitte00:	Not Reported
Use1:	IRRIGATION	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	Not Reported	Date permi:	02/28/1955
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	55
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	WENZEL BEN
Mailing ci:	Not Reported		
Mailing st:	Not Reported		
Driller li:	Not Reported	Mailing zi:	Not Reported
Date last :	1	Pump lic:	Not Reported
Last actio:	02/28/1955		
Site id:	Date the permit was issued. CO5000000360062		

**AG112
SSW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360058

Div:	1	Wd:	2
Wdid:	0	Receipt:	0283034
Permitno:	150284	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521754
Utm y:	4424924		
Loc accur:	Spotted from quarters	Permitted :	8
Use1:	DOMESTIC	Permitte00:	9
Use2: Use3:	STOCK	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
	12/14/1987	Date permi:	12/29/1987

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	Not Reported	Date well :	03/07/1988
Date 1st b:	Not Reported	Date pump :	03/07/1988
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	460
Tperf:	330	Bperf:	460
Pump rate:	15		
Static wat:	45	Full name:	MATHIS LONNIE W.
Mailing ad:	Not Reported		
Mailing ci:	COMMERCE CITY		
Mailing st:	CO	Mailing zi:	80022
Driller li:	489	Pump lic:	489
Date last :	04/29/1988		
Last actio:	Date the pump installation report is received by DWR.		
Site id:	CO5000000360058		

**AG113
SSW
1/2 - 1 Mile
Higher**

CO WELLS CO5000000360059

Div:	1	Wd:	2
Wdid:	208545	Receipt:	9001349
Permitno:	10451	Permitsuf:	R
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	11
Seca:	Not Reported	Q160:	SW
Q40:	SE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	521754
Utm y:	4424924		
Loc accura:	Spotted from quarters	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	21		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	57
Pump rate:	0	Bperf:	0
Static wat:	400		
Mailing ad:	21	Full name:	WENZEL WILLIAM B & DORIS A & MATHI
Mailing ci:	ROUTE 1 BOX 49		
Mailing st:	COMM CITY		
	CO	Mailing zi:	80022

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li:	Not Reported	Pump lic:	Not Reported
Date last :	Not Reported		
Last actio:	Not Reported		
Site id:	CO5000000360059		

**AH114
ENE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364045

Div:	1	Wd:	2
Wdid:	0	Receipt:	0047163
Permitno:	47163	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523759.6875
Utm y:	4426907.5		
Loc accura:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	07/02/2007	Date permi:	07/02/2007
Date 1st b:	09/30/2007	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Two (2) holes to be constructed.		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	UNITED WATER
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PL		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	07/02/2007		
Last actio:	Date the permit was issued.		
Site id:	CO5000000364045		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

AH115
ENE
1/2 - 1 Mile
Lower

CO WELLS CO5000000364044

Div:	1	Wd:	2
Wdid:	0	Receipt:	0044510
Permitno:	44510	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	P-3,P-4
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523759.6875
Utm y:	4426907.5		
Loc accur:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/27/2005	Date permi:	01/31/2005
Date 1st b:	04/27/2005	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	2 wells		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	UNITED WATER & SANITATION
Mailing ci:	5460 S QUEBEC ST		
Mailing st:	GREENWOOD VILLAGE		
Driller li:	CO	Mailing zi:	80111-
Date last :	AUTH	Pump lic:	Not Reported
Last actio:	01/31/2005		
Site id:	Date the permit was issued. CO5000000364044		

AH116
ENE
1/2 - 1 Mile
Lower

CO WELLS CO5000000364047

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Div: Wdid:	1	Wd:	2
Permitno:	0	Receipt:	0244018O
Permitrpl:	10608	Permitsuf:	AD
Current st:	Not Reported	Status des:	Application Denied
Case no:	3	Well name:	Not Reported
City:	Not Reported	Ogcc id:	Not Reported
County:	1		
Management:	ADAMS		
Designated:	0	Manageme00:	Not Reported
Subdivisio:	0	Designat00:	Not Reported
Lot:	Not Reported	Filing:	Not Reported
County par:	Not Reported	Block:	Not Reported
Parcel siz:	Not Reported		
Pm:	0		
Tdir:	S	Ts:	1
Rdir:	S	Rng:	66
Seca:	W	Sec:	1
Q40:	Not Reported	Q160:	SE
Coordsns d:	NW	Coordsns:	0
Coordsew d:	Not Reported	Coordsew:	0
Utm y:	Not Reported	Utm x:	523759.6875
Loc accur:	4426907.5		
Use1:	Spotted from quarters	Permitted :	2
Use2: Use3:	MUNICIPAL	Permitte00:	Not Reported
Aquifer2 n:	Not Reported	Special us:	Not Reported
Permitte01:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte02:	Not Reported		
Annual app:	0		
Date appli:	acres		
Date per00:	0		
Date 1st b:	Not Reported	Date permi:	10/29/1984
Date wel00:	Not Reported	Date well :	Not Reported
Comment :	Not Reported	Date pump :	Not Reported
Elev:	Not Reported		
Tperf:	Not Reported		
Pump rate:	0	Well depth:	0
Static wat:	0	Bperf:	0
Mailing ad:	0		
Mailing ci:	0	Full name:	FARMERS RESERVOIR & IRR
Mailing st:	Not Reported		
Driller li:	BRIGHTON		
Date last :	CO	Mailing zi:	80601
Last actio:	Not Reported	Pump lic:	Not Reported
Site id:	02/28/1994		
	Record corrected		
	CO5000000364047		

**AH117
ENE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364046

Div:	1	Wd:	2
Wdid:	0	Receipt:	0244018N
Permitno:	10607	Permitsuf:	AD
Permitrpl:	Not Reported	Status des:	Application Denied
Current st:	3	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	523759.6875
Utm y:	4426907.5		
Loc accur:	Spotted from quarters	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	10/29/1984
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	FARMERS RESERVOIR & IRR
Mailing ci:	Not Reported		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	02/28/1994		
Site id:	Record corrected CO5000000364046		

**AE118
NE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364517

Div:	1	Wd:	2
Wdid:	206804	Receipt:	0299580
Permitno:	23958	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	KILKER WELL #3
Case no:	80CW0113	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NE
Q40:	SW	Coordsns:	2827
Coordsns d:	S	Coordsew:	2746
Coordsew d:	W	Utm x:	523574.6875

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4427199.5	Permitted :	1
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	IRRIGATION	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	10/26/1978	Date permi:	12/28/1978
Date 1st b:	12/28/1979	Date well :	10/23/1979
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	APD to 20095-R		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
	0	Full name:	KILKER JAMES H & GEORGE D & MARY E
Mailing ad:	21955 E 160TH AVE RT 4 WC RD 4 P O BOX 161		
Mailing ci:	BRIGHTON		
Mailing st:	CO	Mailing zi:	80601
Driller li:	1	Pump lic:	1
Date last :	03/17/2004		
Last actio:	Record corrected		
Site id:	CO5000000364517		

**119
NE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000364873

Div:	1	Wd:	2
Wdid:	0	Receipt:	0405514B
Permitno:	47207	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Permit Expired
Current st:	7	Well name:	LOCHBUIE #3
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	BROMLEY PARK	Filing:	Not Reported
Lot:	1	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	.06		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	NW
Q40:	SE	Coordsns:	1760
Coordsns d:	N	Coordsew:	2560
Coordsew d:	W	Utm x:	523515
Utm y:	4427319.5		
Loc accur:	Spotted from section lines	Permitted :	2
Use1:	MUNICIPAL	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
	08/26/1996	Date permi:	09/19/1996

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	09/19/1997	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Not Reported		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	LOCHBUIE TOWN OF
Mailing ad:	0152 POPLAR		
Mailing ci:	BRIGHTON		
Mailing st:	CO	Mailing zi:	80601
Driller li:	LIC	Pump lic:	Not Reported
Date last :	06/30/1998		
Last actio:	Date permit expires if well not constructed		
Site id:	CO5000000364873		

**120
ENE
1/2 - 1 Mile
Lower**

CO WELLS CO5000000363579

Div:	1	Wd:	2
Wdid:	0	Receipt:	0426761
Permitno:	208465	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	1
Seca:	Not Reported	Q160:	SE
Q40:	SE	Coordsns:	1000
Coordsns d:	S	Coordsew:	1200
Coordsew d:	E	Utm x:	524005.1875
Utm y:	4426643.5		
Loc accura:	Spotted from section lines	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	acres		
Date appli:	0		
Date per00:	02/18/1998	Date permi:	03/10/1998
Date 1st b:	03/10/2000	Date well :	03/24/1998
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	5020	Well depth:	61
Pump rate:	41	Bperf:	61
Static wat:	0		
Mailing ad:	3	Full name:	LOCHBUIE TOWN OF
Mailing ci:	703 WCR 37		
Mailing st:	BRIGHTON		
	CO	Mailing zi:	80601

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Driller li: 1200 Pump lic: Not Reported
 Date last : 04/15/1998
 Last actio: Date the Well Construction and Test Report was received at DWR.
 Site id: CO5000000363579

121
WNW
1/2 - 1 Mile
Higher

CO WELLS CO5000000363900

Div:	1	Wd:	2
Wdid:	205367	Receipt:	9005068
Permitno:	109148	Permitsuf:	Not Reported
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	2
Seca:	Not Reported	Q160:	SW
Q40:	NW	Coordsns:	1735
Coordsns d:	S	Coordsew:	112
Coordsew d:	W	Utm x:	521175.5
Utm y:	4426855.5		
Loc accura:	Spotted from section lines	Permitted :	9
Use1:	STOCK	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	1		
Date per00:	Not Reported	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	04/15/1955	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	0		
Mailing ad:	0	Full name:	BERGMAN NELL J & ROBERT L
Mailing ci:	14141 COUNTRY HILL DR		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	04/15/1955		
Site id:	Date of first beneficial use. CO5000000363900		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

AI122
SE
1/2 - 1 Mile
Lower

CO WELLS CO5000000360519

Div:	1	Wd:	2
Wdid:	206433	Receipt:	9002605
Permitno:	20455	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	Not Reported	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	SE
Q40:	NW	Coordsns:	1563
Coordsns d:	S	Coordsew:	1878
Coordsew d:	E	Utm x:	523801.3125
Utm y:	4425199.5		
Loc accura:	Spotted from section lines	Permitted :	1
Use1:	IRRIGATION	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	Not Reported
Aquifer2 n:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	160		
Annual app:	acres		
Date appli:	0		
Date per00:	Not Reported	Date permi:	Not Reported
Date 1st b:	Not Reported	Date well :	Not Reported
Date wel00:	06/14/1954	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	0
Pump rate:	0	Bperf:	0
Static wat:	996		
Mailing ad:	0	Full name:	CHERRY CREEK FARMS LLC
Mailing ci:	23203 E BROMLEY LN		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601-
Date last :	Not Reported	Pump lic:	Not Reported
Last actio:	10/19/2004		
Site id:	Change of Ownership CO5000000360519		

123
SSW
1/2 - 1 Mile
Higher

FED USGS USGS40000215108

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Org. Identifier:	USGS-CO		
Formal name:	USGS Colorado Water Science Center		
Monloc Identifier:	USGS-395823104442101		
Monloc name:	SC00106614ABB1 USGS 395823104442101		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10190003	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	39.9730395
Longitude:	-104.7396916	Sourcemap scale:	99000
Horiz Acc measure:	1	Horiz Acc measure units:	minutes
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	5050.00
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Valley-Fill Deposits		
Aquifer type:	Not Reported		
Construction date:	19460101	Welldepth:	63
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel

1957-12-10	23.50	

AI124
SE
1/2 - 1 Mile
Lower

CO WELLS CO5000000360414

Div:	1	Wd:	2
Wdid:	0	Receipt:	0471775
Permitno:	55519	Permitsuf:	F
Permitrpl:	Not Reported	Status des:	Well Constructed
Current st:	9	Well name:	Not Reported
Case no:	W4552	Ogcc id:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	41.2		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	12
Seca:	Not Reported	Q160:	SE
Q40:	NE	Coordsns:	1390
Coordsns d:	S	Coordsew:	1950
Coordsew d:	E	Utm x:	523779.40625

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Utm y:	4425147	Permitted :	1
Loc accur:	Spotted from section lines	Permitte00:	Not Reported
Use1:	IRRIGATION	Special us:	Not Reported
Use2: Use3:	Not Reported	Aquifer1 n:	ALL UNNAMED AQUIFERS
Aquifer2 n:	Not Reported		
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
Date per00:	01/26/2001	Date permi:	03/27/2001
Date 1st b:	03/27/2002	Date well :	06/15/2001
Date wel00:	Not Reported	Date pump :	Not Reported
Comment :	Not Reported		
Elev:	Not Reported		
Tperf:	0	Well depth:	43
Pump rate:	28	Bperf:	38
Static wat:	250		
Mailing ad:	2	Full name:	CHERRY CREEK TREE FARMS LLC
Mailing ci:	23202 E BROMLEY LN		
Mailing st:	BRIGHTON		
Driller li:	CO	Mailing zi:	80601-
Date last :	21	Pump lic:	Not Reported
Last actio:	10/19/2004		
Site id:	Change of Ownership		
	CO5000000360414		

**125
South
1/2 - 1 Mile
Lower**

CO WELLS CO5000000359276

Div:	1	Wd:	2
Wdid:	0	Receipt:	0046625
Permitno:	46625	Permitsuf:	MH
Permitrpl:	Not Reported	Status des:	Permit Issued; Completion Status Unknown
Current st:	5	Well name:	Not Reported
Case no:	Not Reported	Ogcid:	Not Reported
City:	1		
County:	ADAMS		
Management:	0	Manageme00:	Not Reported
Designated:	0	Designat00:	Not Reported
Subdivisio:	Not Reported	Filing:	Not Reported
Lot:	Not Reported	Block:	Not Reported
County par:	Not Reported		
Parcel siz:	0		
Pm:	S	Ts:	1
Tdir:	S	Rng:	66
Rdir:	W	Sec:	14
Seca:	Not Reported	Q160:	NE
Q40:	NE	Coordsns:	0
Coordsns d:	Not Reported	Coordsew:	0
Coordsew d:	Not Reported	Utm x:	522561
Utm y:	4424518.5		
Loc accur:	Spotted from quarters	Permitted :	Q
Use1:	OTHER	Permitte00:	Not Reported
Use2: Use3:	Not Reported	Special us:	M
Aquifer2 n:	MONITORING WELL	Aquifer1 n:	ALL UNNAMED AQUIFERS
Permitte01:	Not Reported		
Permitte02:	0		
Annual app:	Not Reported		
Date appli:	0		
	09/26/2006	Date permi:	09/27/2006

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Date per00:	12/25/2006	Date well :	Not Reported
Date 1st b:	Not Reported	Date pump :	Not Reported
Date wel00:	Not Reported		
Comment :	Three (3) holes to be constructed.		
Elev:	0	Well depth:	0
Tperf:	0	Bperf:	0
Pump rate:	0		
Static wat:	0	Full name:	FRICO
Mailing ad:	C/O HYDROKINETICS 12975 W 24TH PL		
Mailing ci:	GOLDEN		
Mailing st:	CO	Mailing zi:	80401-
Driller li:	AUTH	Pump lic:	Not Reported
Date last :	09/27/2006		
Last actio:	Date the permit was issued.		
Site id:	CO5000000359276		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1

WNW
1/2 - 1 Mile

OIL_GAS COOG90000048505

Link fld:	00108355	Attrib 1:	05-001-08355
Attrib 2:	NORTH AMERICAN RESOURCES COMPANY		
Attrib 3:	1 BRIGHTON COMPANY		
Symbol:	LO_XX	Sdf key:	00108355&TYPE=WELL
Facility i:	202950		
Facility type:	WELL	Facility Status:	Plugged and Abandoned
Operator n:	63800		
Well num:	1	Well name:	BRIGHTON COMPANY
Field code:	90750		
Dist n s:	1650		
Dir n s:	S		
Dist e w:	1650		
Dir e w:	W	Qtrqtr:	NESW
Sec:	2	Twp:	1S
Range:	66W	Meridian:	6
Latn:	39.991399		
Longn:	0		
Ground ele:	5093		
Utm x:	521641		
Utm y:	4426833		
Locqual:	Planned Footage	Field name:	WATTENBERG
Name 1:	NORTH AMERICAN RESOURCES COMPANY		
Api seq nu:	08355		
Api county:	001		
Locationid:	376887		
Site id:	COOG90000048505		

2

South
1/2 - 1 Mile

OIL_GAS COOG90000047752

Link fld:	00109193	Attrib 1:	05-001-09193
Attrib 2:	HRM RESOURCES LLC		
Attrib 3:	1 SHAW E UNIT		
Symbol:	LO_XX	Sdf key:	00109193&TYPE=WELL
Facility i:	203633		
Facility type:	WELL	Facility Status:	Producing
Operator n:	10273		
Well num:	1	Well name:	SHAW E UNIT
Field code:	90750		
Dist n s:	0		
Dir n s:	Not Reported		
Dist e w:	0		
Dir e w:	Not Reported	Qtrqtr:	NESE
Sec:	11	Twp:	1S
Range:	66W	Meridian:	6
Latn:	39.976545		
Longn:	0		
Ground ele:	5053		
Utm x:	522460		
Utm y:	4425187		
Locqual:	ACTUAL LatLong	Field name:	WATTENBERG

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Name 1: HRM RESOURCES LLC
 Api seq nu: 09193
 Api county: 001
 Locationid: 320394
 Site id: COOG90000047752

3

North
1/2 - 1 Mile

OIL_GAS

COOG90000048827

Link fld:	00108544	Attrib 1:	05-001-08544
Attrib 2:	NORTH AMERICAN RESOURCES COMPANY		
Attrib 3:	2 BRIGHTON COMPANY		
Symbol:	LO_XX	Sdf key:	00108544&TYPE=WELL
Facility i:	203135		
Facility type:	WELL	Facility Status:	Plugged and Abandoned
Operator n:	63800		
Well num:	2	Well name:	BRIGHTON COMPANY
Field code:	90750		
Dist n s:	990		
Dir n s:	N		
Dist e w:	990		
Dir e w:	E	Qtrqtr:	NENE
Sec:	2	Twp:	1S
Range:	66W	Meridian:	6
Latn:	39.997829		
Longn:	0		
Ground ele:	5052		
Utm x:	522423		
Utm y:	4427549		
Locqual:	Planned Footage	Field name:	WATTENBERG
Name 1:	NORTH AMERICAN RESOURCES COMPANY		
Api seq nu:	08544		
Api county:	001		
Locationid:	377024		
Site id:	COOG90000048827		

4

NNE
1/2 - 1 Mile

OIL_GAS

COOG90000048763

Link fld:	00109236	Attrib 1:	05-001-09236
Attrib 2:	KERR-MCGEE OIL & GAS ONSHORE LP		
Attrib 3:	6-1 HSR-EPPINGER		
Symbol:	LO_XX	Sdf key:	00109236&TYPE=WELL
Facility i:	203676		
Facility type:	WELL	Facility Status:	Producing
Operator n:	47120		
Well num:	6-1	Well name:	HSR-EPPINGER
Field code:	90750		
Dist n s:	0		
Dir n s:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Dist e w:	0	Qtrqtr:	SENW
Dir e w:	Not Reported	Twp:	1S
Sec:	1	Meridian:	6
Range:	66W		
Latn:	39.996494		
Longn:	0		
Ground ele:	5031		
Utm x:	523243		
Utm y:	4427404		
Locqual:	ACTUAL LatLong	Field name:	WATTENBERG
Name 1:	KERR-MCGEE OIL & GAS ONSHORE LP		
Api seq nu:	09236		
Api county:	001		
Locationid:	320406		
Site id:	COOG90000048763		

5
West
1/2 - 1 Mile

OIL_GAS COOG90000048173

Link fld:	00109298	Attrib 1:	05-001-09298
Attrib 2:	VESSELS OIL & GAS COMPANY		
Attrib 3:	1 KREITZER 'C' UNIT		
Symbol:	LO_XX	Sdf key:	00109298&TYPE=WELL
Facility i:	203738		
Facility type:	WELL	Facility Status:	Abandoned Location
Operator n:	93200		
Well num:	1	Well name:	KREITZER 'C' UNIT
Field code:	90750		
Dist n s:	680		
Dir n s:	N		
Dist e w:	400		
Dir e w:	W	Qtrqtr:	NWNW
Sec:	11	Twp:	1S
Range:	66W	Meridian:	6
Latn:	39.984989		
Longn:	0		
Ground ele:	5106		
Utm x:	521261		
Utm y:	4426121		
Locqual:	Planned Footage	Field name:	WATTENBERG
Name 1:	VESSELS OIL & GAS COMPANY		
Api seq nu:	09298		
Api county:	001		
Locationid:	377327		
Site id:	COOG90000048173		

6
ENE
1/2 - 1 Mile

OIL_GAS COOG90000048460

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Link fld:	00109252	Attrib 1:	05-001-09252
Attrib 2:	HS RESOURCES INC		
Attrib 3:	10-1 HSR MILE HIGH		
Symbol:	LO_XX	Sdf key:	00109252&TYPE=WELL
Facility i:	203692		
Facility type:	WELL	Facility Status:	Abandoned Location
Operator n:	41385		
Well num:	10-1	Well name:	HSR MILE HIGH
Field code:	90750		
Dist n s:	1439		
Dir n s:	S		
Dist e w:	1439		
Dir e w:	E	Qtrqtr:	NWSE
Sec:	1	Twp:	1S
Range:	66W	Meridian:	6
Latn:	39.99084		
Longn:	0		
Ground ele:	5017		
Utm x:	523927		
Utm y:	4426778		
Locqual:	Planned Footage	Field name:	WATTENBERG
Name 1:	HS RESOURCES INC		
Api seq nu:	09252		
Api county:	001		
Locationid:	377301		
Site id:	COOG90000048460		

7

ESE

1/2 - 1 Mile

OIL_GAS

COOG90000048119

Link fld:	00106996	Attrib 1:	05-001-06996
Attrib 2:	VESSELS OIL & GAS COMPANY		
Attrib 3:	1 MILE-HI DUCK CLUB-TRACY		
Symbol:	LO_XX	Sdf key:	00106996&TYPE=WELL
Facility i:	201593		
Facility type:	WELL	Facility Status:	Plugged and Abandoned
Operator n:	93200		
Well num:	1	Well name:	MILE-HI DUCK CLUB-TRACY
Field code:	90750		
Dist n s:	990		
Dir n s:	N		
Dist e w:	990		
Dir e w:	E	Qtrqtr:	NENE
Sec:	12	Twp:	1S
Range:	66W	Meridian:	6
Latn:	39.98417		
Longn:	0		
Ground ele:	5029		
Utm x:	524068		
Utm y:	4426038		
Locqual:	Planned Footage	Field name:	WATTENBERG

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Name 1:	VESSELS OIL & GAS COMPANY
Api seq nu:	06996
Api county:	001
Locationid:	375895
Site id:	COOG90000048119

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for ADAMS County: 1

- Note: Zone 1 indoor average level > 4 pCi/L.
 : Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
 : Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for ADAMS COUNTY, CO

Number of sites tested: 23

<u>Area</u>	<u>Average Activity</u>	<u>% <4 pCi/L</u>	<u>% 4-20 pCi/L</u>	<u>% >20 pCi/L</u>
Living Area - 1st Floor	1.786 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	6.196 pCi/L	65%	30%	4%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)

Source: United States Geologic Survey

A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data

Source: Division of Wildlife

Telephone: 970-416-3360

HYDROGEOLOGIC INFORMATION

AQUIFLOW^R Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)

Telephone: 800-672-5559

SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Colorado GIS Well Database

Source: Office of State Engineer, Division of Water Resources

Telephone: 303-866-3581

The GIS Well database includes all wells that the Division of Water Resources permits.

OTHER STATE DATABASE INFORMATION

Oil and Gas Well Locations

Source: Department of Natural Resources

Telephone: 303-894-2100

RADON

State Database: CO Radon

Source: Department of Public Health & Environment

Telephone: 303-692-3090

Radon Study in Colorado

Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities

Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater

Source: Department of Commerce, National Oceanic and Atmospheric Administration

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every receipt, invoice, and bill should be properly filed and indexed for easy retrieval. This not only helps in tracking expenses but also ensures compliance with tax regulations.

Next, the document outlines the various methods available for managing financial data. From traditional paper-based systems to modern cloud-based software solutions, it provides a comprehensive overview of the options. It highlights the benefits of digital systems, such as increased security, ease of access, and the ability to generate reports and analytics in real-time.

The document also addresses the issue of data security and privacy. It discusses the importance of implementing robust security measures to protect sensitive financial information from unauthorized access and cyber threats. This includes the use of encryption, secure storage, and regular security audits.

Finally, the document provides a detailed guide on how to integrate financial management systems with other business applications. It explains the importance of ensuring data consistency and accuracy across different platforms, and offers practical advice on how to achieve this through API integrations and data synchronization tools.

I-76 & Bridge Street INTERCHANGE



Agency Consultation

Documentation

Appendix G Contents

- Colorado State Historic Preservation Office Consultation
- City of Brighton Historic Preservation Commission Consultation
- Adams County Planning and Development Consultation on Historic Resources
- Native American Tribal Consultation
- Colorado Department of Transportation Paleontological Resources Memo
- Section 4(f) Coordination
- United States Fish and Wildlife Service Concurrence of No Effect

Colorado State Historic Preservation Office Consultation



MEMORANDUM

Planning & Environmental
2000 South Holly Street
Denver, Colorado 80222
(303)757-9372
FAX (303)757-9036

TO: Jon Chesser, R1 Environmental Program Manager
FROM: Ashley L. Bushey, Region 1 Historian
DATE: October 10, 2014
SUBJECT: UPDATE: Section 106 Clearance, CDOT Project CC 0761-202 (17313) Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County

This memo is to notify you that the Section 106 Consultation has been completed for the project referenced above; which updates an earlier clearance for the project. This update covers a revised and expanded Area of Potential Effect (APE) based on design changes. No new historic resources were identified within the expanded APE limits.

**Section 106
SHPO Response**

CDOT consulted on eligibility and effects with the State Historic Preservation Officer (SHPO), and with the City of Brighton Historic Preservation Commission, in the capacity of consulting party, in letters dated September 5, 2014. In a letter dated September 17, 2014, SHPO concurred with the updated, expanded limits of the APE. No comments were received from the consulting party within the 30-day consultation period.

Section 4(f)

No additional historic resources were identified within the expanded APE; there are no further requirements under 23 USC 138, 49 USC 303, and 23 CFR 774.

Clearance to proceed on this project is recommended. As always, please notify me of any changes to the project scope or limits that would require a re-evaluation of the clearance.

ALB 10-10-14

Enclosures:
Initial Clearance 7.29.14
Consultation Correspondence
Cc: File



September 17, 2014

Charles Attardo
Region 1 Planning and Environmental Manager
Colorado Department of Transportation, Region 1
2000 South Holly Street
Denver, CO 80222

Re: Update: Area of Potential Effect, CDOT Project Number: CC 0761-202/17313 –
Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, CO
(CHS #65749)

Dear Mr. Attardo:

Thank you for your correspondence dated September 5, 2014 and received by our office on September 10, 2014 regarding the review of the above-mentioned project under Section 106 of the National Historic Preservation Act (Section 106).

After review of the submitted information, we do not object to the proposed update to the Area of Potential Effects (APE) for the project. Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Manager, at (303) 866-4678.

Sincerely,

Edward C. Nichols
State Historic Preservation Officer



COLORADO

Department of Transportation

Region 1

Planning & Environmental
2000 South Holly Street,
Denver, CO 80222-4818

September 5, 2014

Mr. Edward C. Nichols
State Historic Preservation Officer
History Colorado
1200 Broadway
Denver, CO 80203

SUBJECT: Update: Area of Potential Effect, CDOT Project CC 0761-202 (17313) –Environmental Assessment I-76 and Bridge Street, Adams County (CHS# 65749)

Dear Mr. Nichols:

This letter and the attached materials constitute a request for concurrence on updates to the Area of Potential Effect (APE) for the project referenced above. The project involves construction of a new interchange at Interstate 76 and Bridge Street in Brighton, Adams County. Consultation under NHPA Section 106 was initiated with your office by a letter dated April 1, 2014, including APE, eligibility, and effects. Concurrence was provided by your office by a letter dated April 21, 2014. Since that time, a minor change has been added to the project scope; a stoplight will be installed at the intersection of Bridge Street/E. 160th Avenue and Prairie Falcon Parkway, located west of the initial project area. This work will remain within existing right-of-way.

A search of the COMPASS database maintained by History Colorado did not indicate additional previously surveyed historic resources. A review of Assessor records revealed the land surrounding the proposed stoplight location is vacant or consists of residential development dating within the last fifteen (15) years. Because none of these properties are fifty-years old or older, they do not require review under Section 106 of the National Historic Preservation Act of 1966 (NHPA).

Area of Potential Effects: The original APE limits remain the same, with the addition of a second geographic area at the intersection of Bridge Street/E. 160th Avenue and Prairie Falcon Way to account for potential effects connected to the intersection signalization improvements referenced above. No work or project activities are included along Bridge Street/E. 160th Avenue between the subject intersection and initial APE boundary; this area was therefore excluded from the APE. Because no additional historic properties were identified, parcels adjacent to the subject intersection were also excluded from the APE. Please refer to the attached APE map for additional details.

Because no additional historic resources were identified in the expanded APE, no survey or determinations of eligibility are warranted.

We request your comments on the updated Area of Potential Effect. This information has been sent concurrently to the City of Brighton, Long Range & Historic Preservation Planner. Any response from them will be forwarded to you. Thank you in advance for your prompt attention to this matter. If you require additional information, please contact Region 1 Historian Ashley L. Bushey at (303) 757-9397.

Sincerely,

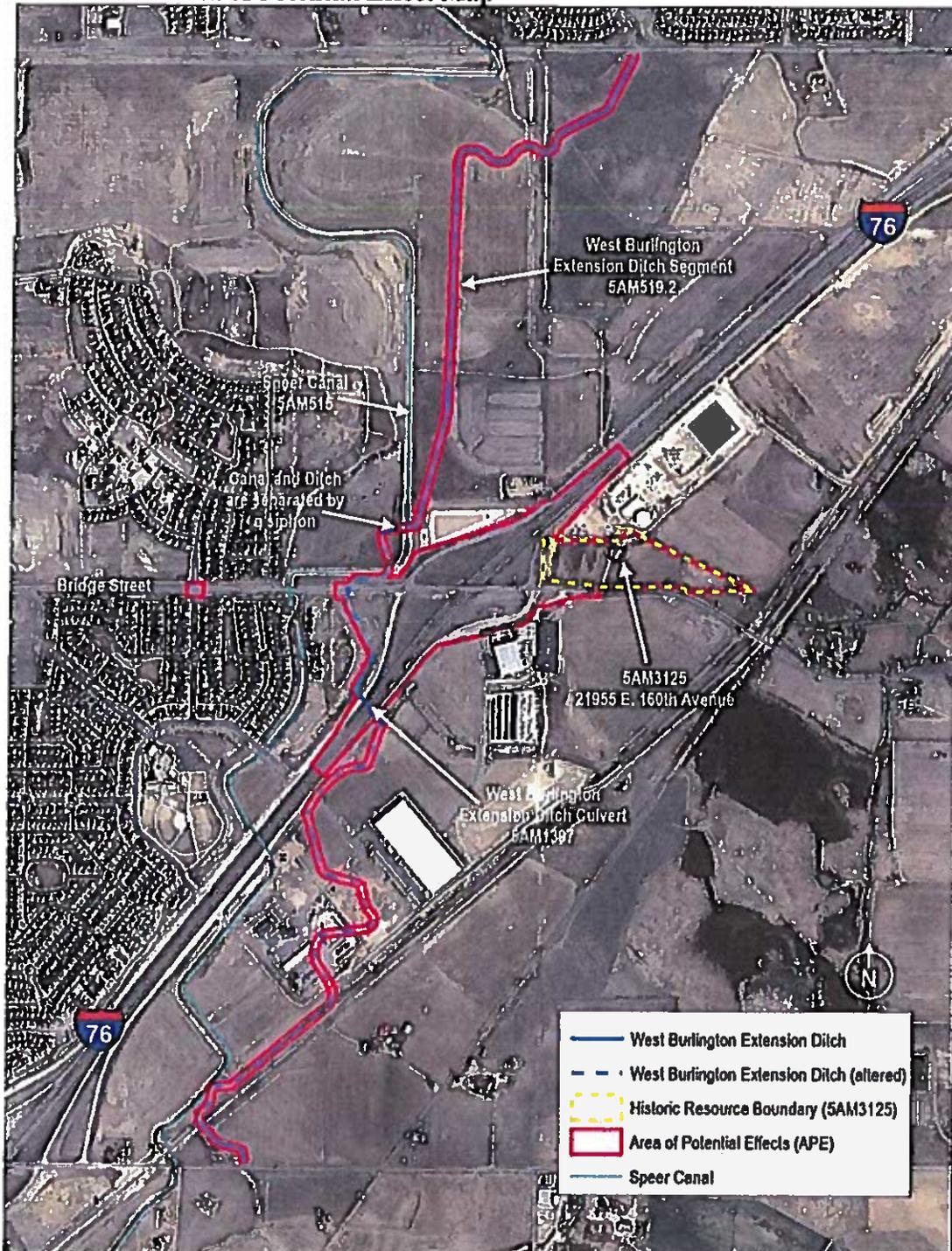


for Chuck Attardo
Region 1 Planning and Environmental Manager

Attachments: APE Map Update

cc: Jon Chesser, CDOT Region 1
Amy Kennedy, Pinyon Environmental, Inc.
File/CF

Attachment: Area of Potential Effect Map





COLORADO

Department of Transportation

Region 1

Planning & Environmental
2000 South Holly Street,
Denver, CO 80222-4818

September 5, 2014

Ms. Aja Tibbs, Long Range & Historic Preservation Planner
City of Brighton Historic Preservation Commission
500 South 4th Avenue
Brighton, CO 80601

SUBJECT: Update: Area of Potential Effect, CDOT Project CC 0761-202 (17313) –Environmental Assessment I-76 and Bridge Street, Adams County (CHS# 65749)

Dear Ms. Tibbs:

This letter and the attached materials constitute a request for comments on updates to the Area of Potential Effect (APE) for the project referenced above. The project involves construction of a new interchange at Interstate 76 and Bridge Street in Brighton, Adams County. Consultation under NHPA Section 106 was initiated with your office by a letter dated April 1, 2014, including APE, eligibility, and effects. Comments were provided by your office by a letter dated April 17, 2014. Since that time, a minor change has been added to the project scope; a stoplight will be installed at the intersection of Bridge Street/E. 160th Avenue and Prairie Falcon Parkway, located west of the initial project area. This work will remain within existing right-of-way.

A search of the COMPASS database maintained by History Colorado did not indicate additional previously surveyed historic resources. A review of Assessor records revealed the land surrounding the proposed stoplight location is vacant or consists of residential development dating within the last fifteen (15) years. Because none of these properties are fifty-years old or older, they do not require review under Section 106 of the National Historic Preservation Act of 1966 (NHPA).

Area of Potential Effects: The original APE limits remain the same, with the addition of a second geographic area at the intersection of Bridge Street/E. 160th Avenue and Prairie Falcon Way to account for potential effects connected to the intersection signalization improvements referenced above. No work or project activities are included along Bridge Street/E. 160th Avenue between the subject intersection and initial APE boundary; this area was therefore excluded from the APE. Because no additional historic properties were identified, parcels adjacent to the subject intersection were also excluded from the APE. Please refer to the attached APE map for additional details.

Because no additional historic resources were identified in the expanded APE, no survey or determinations of eligibility are warranted.

We request your comments on the updated Area of Potential Effect. This information has been sent concurrently to the Colorado State Historic Preservation Office (SHPO). Any response from them will be forwarded to you. Thank you in advance for your prompt attention to this matter. If you require additional information, please contact Region 1 Historian Ashley L. Bushey at (303) 757-9397.

Ms. Tibbs
September 5, 2014
Page 2

Sincerely,

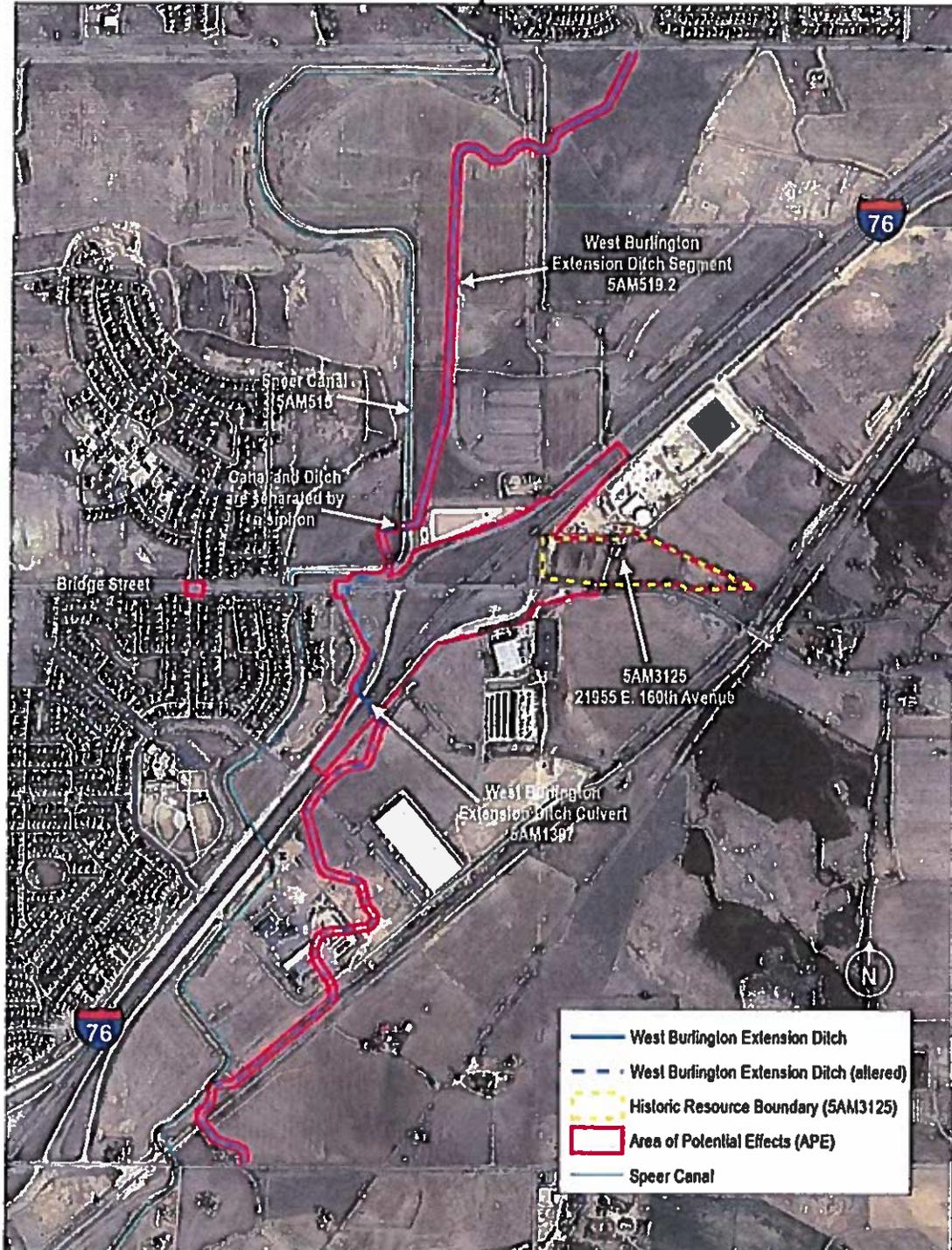


fu - Chuck Attardo
Region 1 Planning and Environmental Manager

Attachments: APE Map Update

cc: Jon Chesser, CDOT Region 1
Amy Kennedy, Pinyon Environmental, Inc.
File/CF

Attachment: Area of Potential Effect Map





COLORADO
Department of Transportation
Region 1

MEMORANDUM

Planning & Environmental
2000 South Holly Street
Denver, Colorado 80222
(303)757-9372
FAX (303)757-9036

TO: Jon Chesser, RI Environmental Program Manager
FROM: Ashley L. Bushey, Region 1 Historian
DATE: July 29, 2014
SUBJECT: Section 106 Clearance, CDOT Project CC 0761-202 (17313) Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County

This memo is to notify you that the Section 106 Consultation has been completed for the project referenced above.

Section 106

SHPO Response

CDOT consulted on eligibility and effects with the State Historic Preservation Officer (SHPO), and with the City of Brighton Historic Preservation Commission and Adams County Planning and Development Department, in the capacity of Consulting Parties, in letters dated April 1, 2014. In a letter dated April 21, 2014 (received April 28, 2014), SHPO concurred with the recommended determinations of eligibility for resource 5AM519, including segment 5AM519.2 (*non-supporting*) and 5AM3125 (*Not Eligible*). SHPO concurred with the recommended finding of *no adverse effect* for resource 5AM519, including segment 5AM519.2 and with the recommended finding of *no historic properties affected* with regard to resource 5AM3125.

On May 28, 2014, CDOT received a letter dated April 17, 2014 from the City of Brighton Historic Preservation Commission.

Section 4(f)

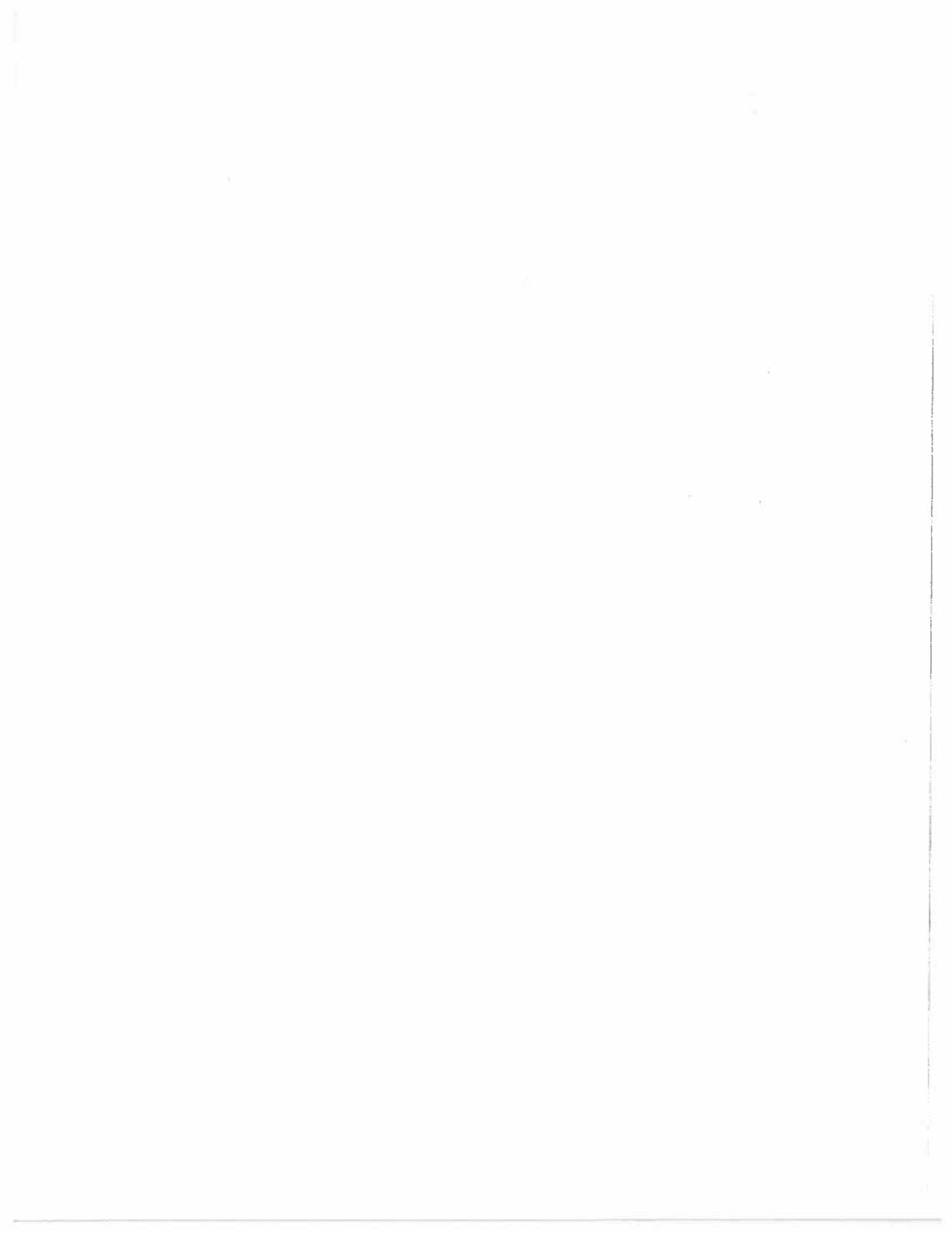
Segment 5AM519.2 of the West Burlington Extension Ditch occurs within the project area. The project does not require permanent incorporation of the resource into a transportation facility, nor does it require permanent or temporary easements from the resource to accommodate the project. The project does not result in a *use* under Section 4(f); there are no further requirements under 23 USC 138, 49 USC 303, and 23 CFR 774.

Clearance to proceed on this project is recommended. As always, please notify me of any changes to the project scope or limits that would require a re-evaluation of the clearance.

AS 7.29.14

Enclosures: Consultation Correspondence

Cc: File



April 21, 2014



Jane Hann
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 –
Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, CO
(CHS #65749)

Dear Ms. Hann,

Thank you for your correspondence dated April 1, 2014 and received by our office on April 4, 2014 regarding the review of the above-mentioned project under Section 106 of the National Historic Preservation Act (Section 106).

After review of the submitted information, we do not object to the proposed Area of Potential Effects (APE) for the project. After review of the provided survey information, we concur that resource 5AM.3125 is not eligible for the National Register of Historic Places. We concur that the entire linear resource 5AM.519 is eligible and that segment 5AM.519.2 does not retain integrity and, therefore, does not support the overall eligibility of resource 5AM.519.2. We also concur that resource 5AM.1397 is not eligible for the National Register of Historic Places.

After review of the scope of work and assessment of adverse effect, we concur with the recommended finding of *no adverse effect* [36 CFR 800.5(b)] for resource 5AM.519, including segment 5AM.519.2. We concur with the recommended finding of *no historic properties affected* [36 CFR 800.4(d)(1)] for resource 5AM.3125. No finding of effect was recommended for resource 5AM.1397; however, we recommend a finding of *no historic properties affected* [36 CFR 800.4(d)(1)]. We acknowledge that FHWA intends to make a *de minimis* determination in respect to the requirements of Section 4(f).

Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Manager, at (303) 866-4678.

Sincerely,

Edward C. Nichols
State Historic Preservation Officer



City of Brighton
500 South 4th Avenue
Brighton, CO 80601
303-655-2000 Office
www.brightonco.gov

April 17, 2014

Region 1. Planning and Environmental
Attn: Charles Attardo – Region 1 Planning and Environmental Manager
2000 South Holly Street
Denver, CO 80222
(303) 757-9929

RE: Brighton Historic Preservation Section 106 Review
I-76 & Bridge Street Interchange – Project Number: CC 0761-202/17313

Dear Mr. Attardo;

On April 4, 2014 packet was received requesting a Section 106 Review of four different alternatives (one without change) for the Interchange at Interstate 76 and Bridge Street.

After review of the proposed alternatives and performing additional property research, staff finds that the three proposals for change will not negatively impact the historic significance of the area. The three potential historic resources are not eligible for historic designation because of their lack of integrity or historical value. In addition, your report indicates that the interchange proposals will not physically modify the resources. While, the visual setting of all three resources will be impacted with the changes, this has already occurred through the approval and future construction of surrounding development.

Please note that this review is separate from the planning and permitting review process required by regulation within the Municipal Code. The above response is specific to your request of historic impact.

Thank you for consulting with the City of Brighton during the planning process. Please feel free to contact me if you need further assistance.

Sincerely,

Aja Tibbs
Long Range & Historic Preservation Planner
Community Development Department
City of Brighton
303-655-2015
atibbs@brightonco.gov

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1, Planning and Environmental
2000 South Holly Street
Denver, CO 80222
(303) 767-9929
(303) 767-9036 FAX



April 1, 2014

Mr. Edward C. Nichols
State Historic Preservation Officer
History Colorado
1200 Broadway
Denver, CO 80203

SUBJECT: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 – Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, Colorado

Dear Mr. Nichols:

This letter and attached documents constitute a request for concurrence on Determinations of Eligibility and Effects for the project referenced above. The project involves construction of a new interchange at I-76 and Bridge Street in Brighton, Adams County. The project is a joint project of the Colorado Department of Transportation (CDOT), Federal Highway Administration (FHWA), and the City of Brighton (Brighton).

Project Description and Alternatives

The project proposes to construct a new interchange at I-76 and Bridge Street (SH7). The current I-76 overpass has no interchange at Bridge Street. Traffic currently accesses the highway via interchanges at Baseline Road (168th Avenue) or Bromley Lane (152nd Avenue). The subject project is located at mile marker 81.626 in Brighton. This interchange has been identified in Adams County's Top-Ten Ranked Urbanized Road Priority Projects. Bridge Street provides an opportunity to increase regional east-west connectivity that will become increasingly important with future population growth and increased travel demand. Four design alternatives, including a No Action Alternative, were examined as a part of this study.

No Action Alternative

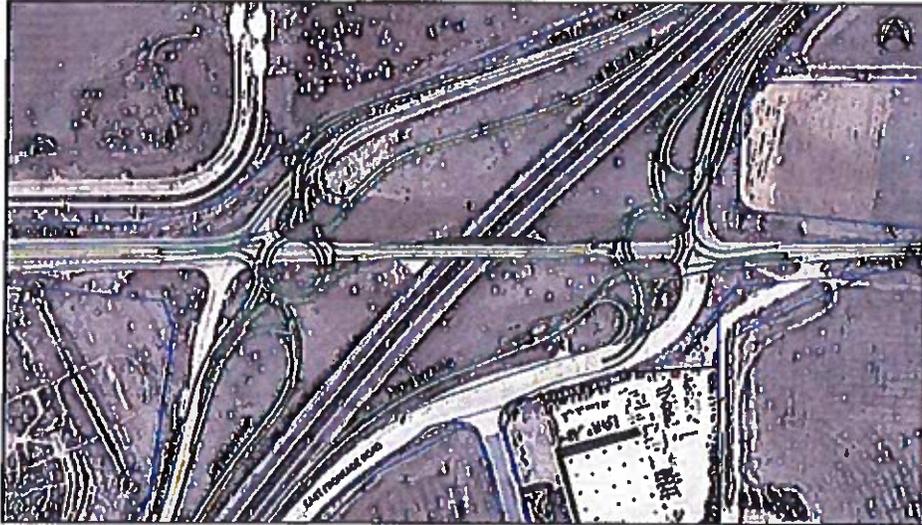
The No Action Alternative is the baseline for the other proposed alternatives. Under the No Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

Alternative #1 (Preferred Alternative)

The Preferred Alternative consists of a two roundabout interchange. This alternative combines the frontage roads and ramp terminals to make one 6-legged roundabout on both the east and west sides of I-76. The existing bridge (E-18-AO) will not be replaced. Each roundabout has an outside diameter of 200 feet including a 12-foot truck apron for truck traffic. Both roundabouts have been placed off center of the existing Bridge Street centerline to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-

foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 1. Preferred Alternative – Two Roundabout Interchange



Alternative #2 Four Roundabout Interchange Design

Alternative 2 is a four roundabout interchange. This alternative creates two (4-legged) roundabouts on each side (east and west) of I-76. The existing bridge (E-18-AO) will not be replaced. The two 4-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 110 feet, including a 12-foot truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts have been placed off center of the existing Bridge Street center line slightly to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 2. Alternative 2 – Four Roundabout Interchange

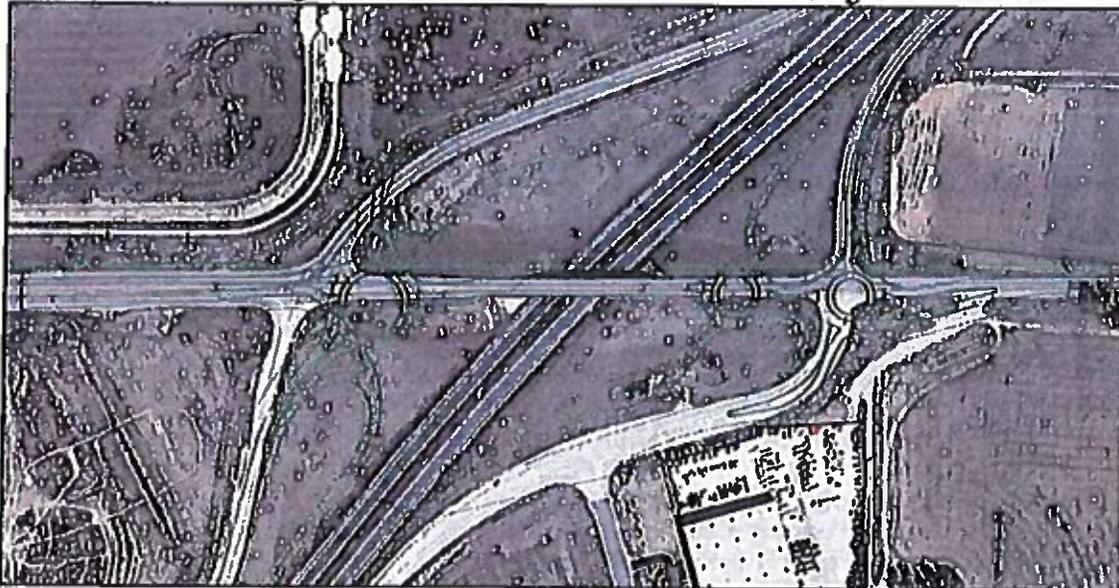


Alternative #3 Three Roundabout Interchange Design

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76. The west frontage road and I-76 westbound ramps are combined into one 6-legged roundabout with an outside diameter of 200 feet including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one 4-legged roundabout and the frontage roads into a 4-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet including a 12-foot truck apron. This preserves the existing bridge and has minor right of way impacts, primarily to the east. The two 4-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

There are no plans for widening the frontage road to accommodate the improvements and currently decisions for new curbs, gutters, and drainage will be decided with the final design. There are no proposed changes to I-76.

Figure 3. Alternative 3 – Three Roundabout Interchange



Area of Potential Effects

The APE was developed to account for direct and indirect effects created by the project and encompasses the project limits and historic boundaries for resources intersected or affected by the project. Because the project limits for alternatives are very close, the APE was drawn to encompass the limits of all three alternatives. Please refer to Figure 4 (APE Map) for additional information.

Survey Methodology

A search of the COMPASS database was completed, indicating the APE includes the West Burlington Canal Culvert (5AM1397). No additional, previously recorded historic resources were identified within the APE. A search of the Adams County Assessor's records was completed to identify construction dates for resources within the APE. Two unrecorded resources were identified: a segment of the West

Burlington Extension Ditch and a property at 21955 E. 160th Avenue, containing a house constructed in 1957. Additional research on these resources was completed at the Denver Public Library, Adams County Records Office, and a site visit was completed by a historian from Pinyon Environmental.

The resource located at 21955 E. 160th Avenue was evaluated using OAHF Form 1403. The West Burlington Extension Ditch segment was evaluated using OAHF Forms 1400 and 1418. The Bridge Street Bridge (E-18-AO) was constructed in 1986; the structure is not yet 50-years old and was not evaluated for the purposes of Section 106.

The project may require easements or right-of-way acquisitions from up to eleven (11) properties and parcels as reflected in Figure 6 (attached), including the property at 21955 E. 160th Avenue. The remaining ten (10) properties do not contain resources that meet or exceed fifty years of age. These resources were not evaluated for NRHP eligibility and are not further addressed in this submission.

Eligibility Determinations

West Burlington Extension Ditch Segment (SAM519.2): The West Burlington Extension Ditch in Adams County was previously designated *not eligible* by SHPO in 1988. Due to the age of this determination, the subject segment was evaluated for the purpose of this project. The overall resource was not re-evaluated, but is being treated as significant to the National Register of Historic Places (NRHP) under Criterion A for its role in the development of agriculture and irrigation systems in the area northeast of Denver and within Adams County. The West Burlington Extension Ditch is part of a larger ditch system; the current Standley Lake Irrigation System, operated by the Farmer's Reservoir and Irrigation Company (FRICO). The Burlington Ditch, Reservoir and Land Company of Denver constructed the West Burlington Extension Ditch in 1894. The segment of the West Burlington Extension Ditch recorded for this project is no longer active and has been destroyed in several places, compromising integrity of design, workmanship, and materials. The area surrounding this segment is undergoing newer residential and business development, compromising integrity of setting, feeling, and association. The segment no longer supports the eligibility of the overall resource and is determined *non-supporting* of the eligibility of the overall resource SAM519.

21955 E. 160th Avenue, Brighton, CO (SAM3125): The property contains a Ranch-style house constructed in 1957. The house is not significant to the National Register of Historic Places (NRHP) under Criterion A because it is not associated with events that have made a significant contribution to the broad pattern of our history. The farm was not part of the early agricultural history of the Brighton area. Although it is assumed that the land was once part of a larger agricultural property, encroaching development of residential and businesses on the south and north of the property indicate that the land no longer holds a significant agricultural presence. The resource is not significant under Criterion B because there are no known significant persons who lived in the house or owned the farm property. The resource is not significant under Criterion C because it does not embody the distinctive characteristics of a type, period, method of construction, or represent the work of a master. The Ranch-style was a common building type in the 1950s and 1960s, and the subject resource lacks unique features or characteristics that distinguish the style and is not an early or exceptional example. The subject resource is a modest example of the ranch type, including modest eaves, hipped roof, attached garage, and a minimal front porch. The resource lacks the horizontal emphasis that is the hallmark of the style; the vertical casement windows on the south and front facades detract from any horizontal emphasis created by the siding material. There is a lack of picture window(s), back porch or patio, sliding doors, and landscaping elements typically included with better examples of the style. The resource does not include sufficient distinctive characteristics of the Ranch type to be considered a significant example of its type, period, or method of construction and therefore is not significant under Criterion C. Finally, the resource is not significant under Criterion D

because it does not likely have the potential to yield important historical information. Because the resource lacks significance, it is determined *not eligible*.

West Burlington Canal Culvert (SAM1397): The West Burlington Canal Culvert (SAM1397) carries the West Burlington Extension Ditch under I-76. The culvert was constructed in 1935 and determined *officially not eligible* in 2002 as part of the Colorado Historic Bridge Inventory.

Effects Determination

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21955 E. 160th Avenue, Brighton, CO (SAM3125): The subject property is located east of the proposed interchange of I-76 and Bridge Street. All three Action Alternatives include the acquisitions from the western portion of the property as well as a temporary easement to accommodate the construction stage, as reflected in the table below.

Alternative	Permanent Acquisition	Temporary Easement
#1 Preferred Alternative	990.66 square feet (0.023 acres)	765.99 square feet (0.018 acres)
#2 Alternative	155 square feet (0.004 acres)	378 square feet (0.009 acres)
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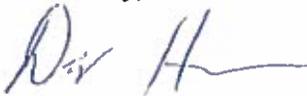
Please refer to the attached map (Figure 5) for visual representations of the acquisitions on the property. Because the resource is determined *not eligible*, the project will result in a finding of *no historic properties affected*.

Notification of Section 4(f) De Minimis Determination

This project has been determined to have *no adverse effect* to the West Burlington Extension Ditch (SAM519), including segment SAM519.2. Based on this finding, FHWA may make a determination of de minimis finding for the Section 4(f) requirements for this historic resource.

We request your concurrence with these determinations of eligibility and effects outlined above and acknowledgement of the potential Section 4(f) de minimis finding. Thank you in advance for your prompt attention to this matter. If you require additional information, please contact Region 1 Historian Ashley L. Bushey at (303) 757-9397 or ashley.bushey@state.co.us.

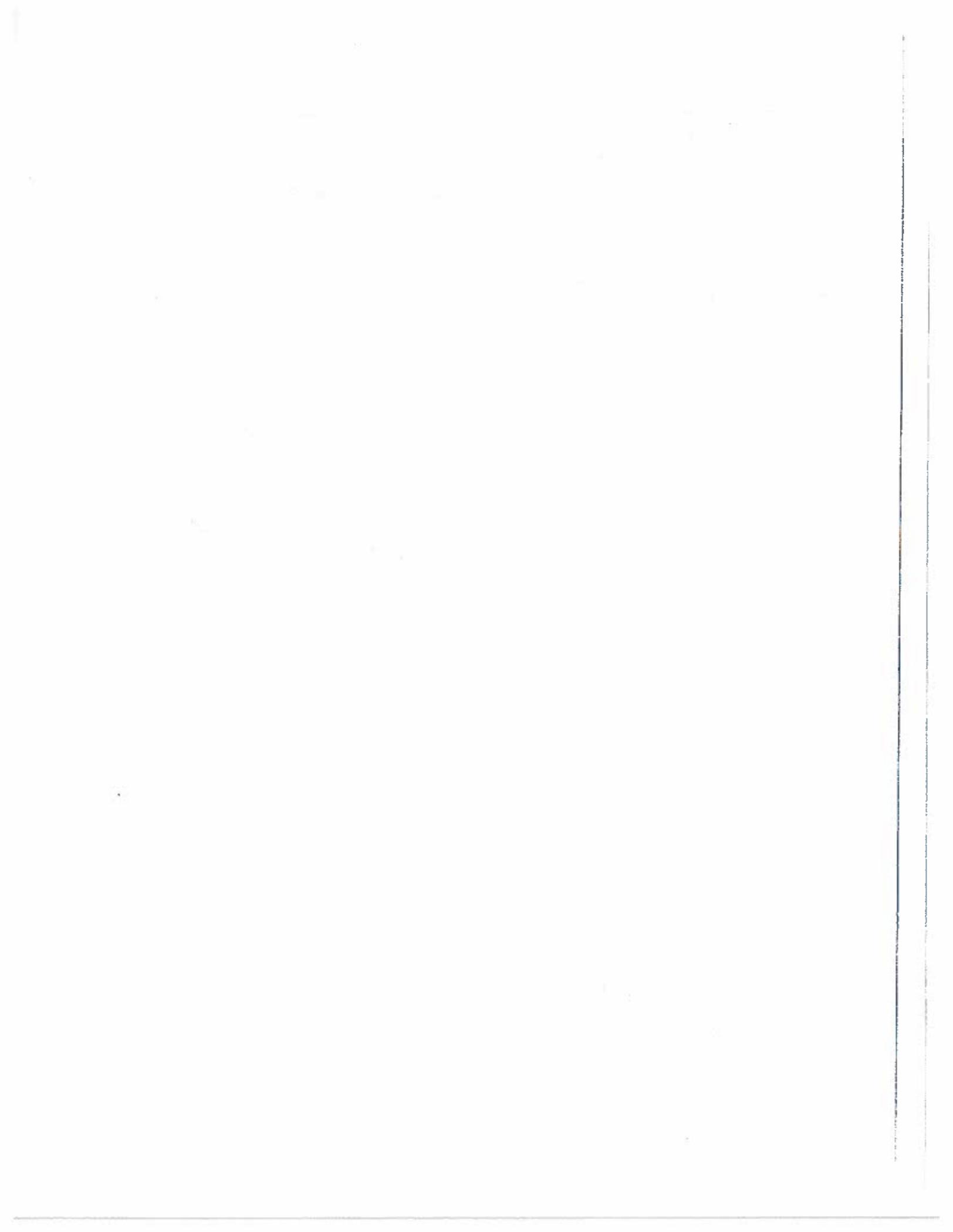
Sincerely,



Charles Attardo
Region 1 Planning and Environmental Manager

Attachments: Figure 4 APE Map
Figure 5 Acquisition Map
Figure 6 Table of Acquisitions
Site Forms and supporting
documentation (SAM519.2, SAM3125)

cc: Amy Kennedy, Piñon Environmental, Inc.
Lisa Schoch, CDOT Environmental Programs
Branch
File/CF



STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1, Planning and Environmental
2000 South Holly Street
Denver, CO 80222
(303) 757-9920
(303) 757-9036 FAX



April 1, 2014

Ms. Aja Tibbs, Long Range & Historic Preservation Planner
City of Brighton Historic Preservation Commission
500 South 4th Avenue
Brighton, CO 80601

SUBJECT: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 – Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, Colorado

Dear Ms. Tibbs:

As you may be aware, the Colorado Department of Transportation (CDOT), Federal Highway Administration (FHWA), and the City of Brighton (Brighton) propose construction of a new interchange at I-76 and Bridge Street in Brighton, Adams County. As part of the Section 106 obligation to consider effects of the project on historic properties eligible for or listed on the National Register of Historic Places (NRHP), we are providing the City of Brighton Historic Preservation Commission with the opportunity to comment on our effects determinations for the project.

Project Description and Alternatives

The project proposes to construct a new interchange at I-76 and Bridge Street (SH7). The current I-76 overpass has no interchange at Bridge Street. Traffic currently accesses the highway via interchanges at Baseline Road (168th Avenue) or Bromley Lane (152nd Avenue). The subject project is located at mile marker 81.626 in Brighton. This interchange has been identified in Adams County's Top-Ten Ranked Urbanized Road Priority Projects. Bridge Street provides an opportunity to increase regional east-west connectivity that will become increasingly important with future population growth and increased travel demand. Four design alternatives, including a No Action Alternative, were examined as a part of this study.

No Action Alternative

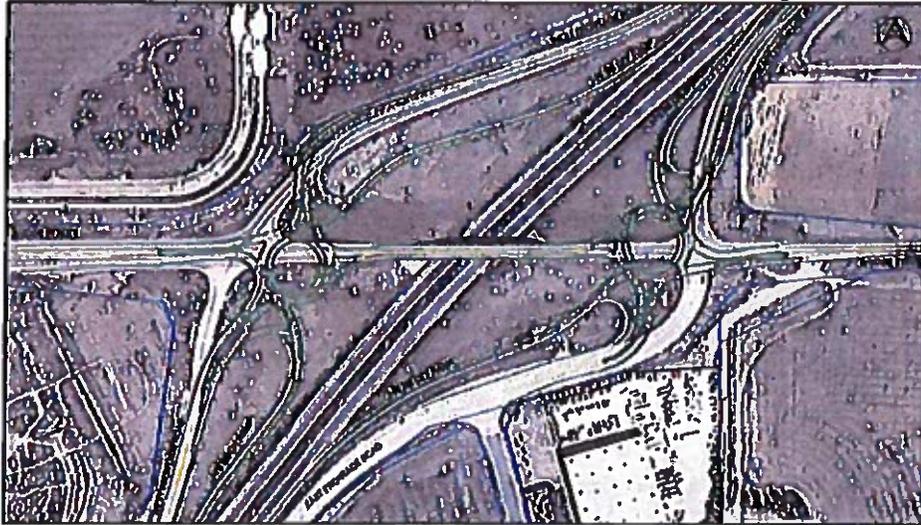
The No Action Alternative is the baseline for the other proposed alternatives. Under the No Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

Alternative #1 (Preferred Alternative)

The Preferred Alternative consists of a two roundabout interchange. This alternative combines the frontage roads and ramp terminals to make one 6-legged roundabout on both the east and west sides of I-76. The existing bridge (E-18-AO) will not be replaced. Each roundabout has an outside diameter of 200 feet including a 12-foot truck apron for truck traffic. Both roundabouts have been placed off center of the existing Bridge Street centerline to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-

foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

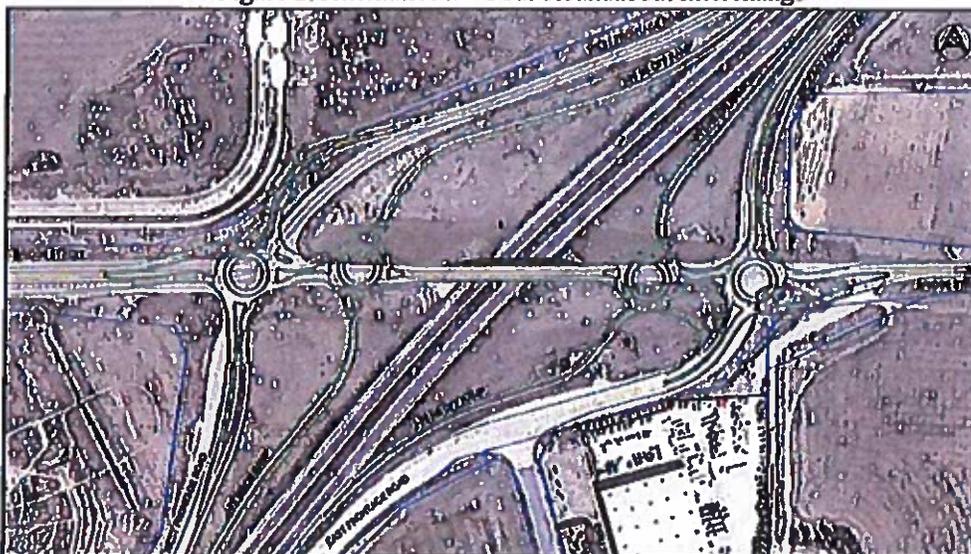
Figure 1. Preferred Alternative – Two Roundabout Interchange



Alternative #2 Four Roundabout Interchange Design

Alternative 2 is a four roundabout interchange. This alternative creates two (4-legged) roundabouts on each side (east and west) of I-76. The existing bridge (E-18-AO) will not be replaced. The two 4-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 110 feet, including a 12-foot truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts have been placed off center of the existing Bridge Street center line slightly to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 2. Alternative 2 – Four Roundabout Interchange

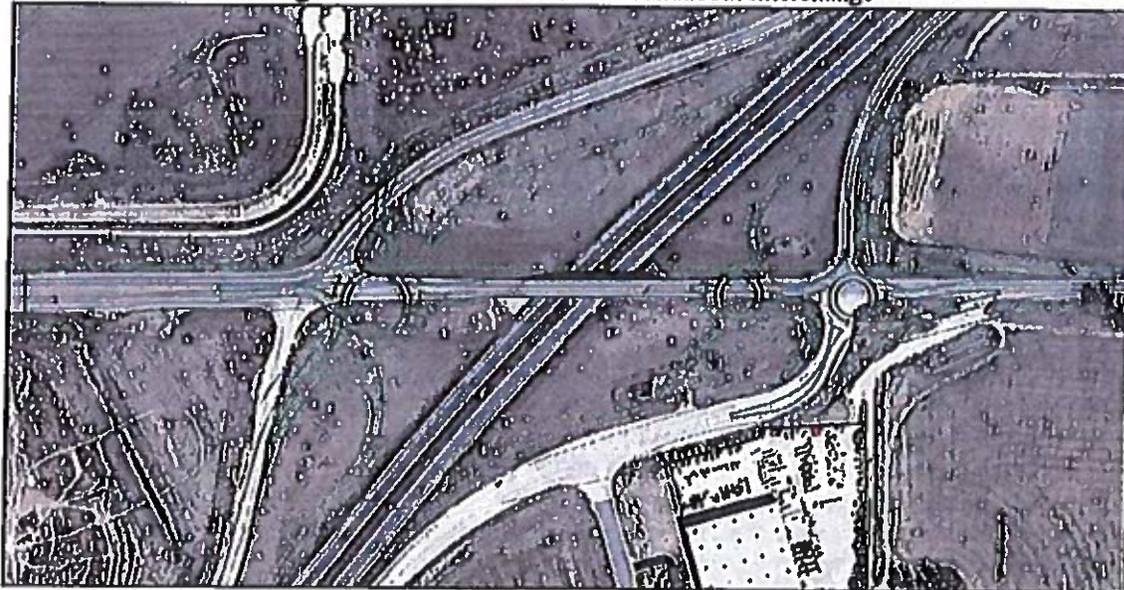


Alternative #3 Three Roundabout Interchange Design

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76. The west frontage road and I-76 westbound ramps are combined into one 6-legged roundabout with an outside diameter of 200 feet including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one 4-legged roundabout and the frontage roads into a 4-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet including a 12-foot truck apron. This preserves the existing bridge and has minor right of way impacts, primarily to the east. The two 4-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles as a traffic calming technique. Splitter Islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

There are no plans for widening the frontage road to accommodate the improvements and currently decisions for new curbs, gutters, and drainage will be decided with the final design. There are no proposed changes to I-76.

Figure 3. Alternative 3 – Three Roundabout Interchange



Area of Potential Effects

The APE was developed to account for direct and indirect effects created by the project and encompasses the project limits and historic boundaries for resources intersected or affected by the project. Because the project limits for alternatives are very close, the APE was drawn to encompass the limits of all three alternatives. Please refer to Figure 4 (APE Map) for additional information.

Survey Methodology

A search of the COMPASS database was completed, indicating the APE includes the West Burlington Canal Culvert (SAM1397). No additional, previously recorded historic resources were identified within the APE. A search of the Adams County Assessor's records was completed to identify construction dates for resources within the APE. Two unrecorded resources were identified: a segment of the West

Burlington Extension Ditch and a property at 21955 E. 160th Avenue, containing a house constructed in 1957. Additional research on these resources was completed at the Denver Public Library, Adams County Records Office, and a site visit was completed by a historian from Pinyon Environmental.

The resource located at 21955 E. 160th Avenue was evaluated using OAHF Form 1403. The West Burlington Extension Ditch segment was evaluated using OAHF Forms 1400 and 1418. The Bridge Street Bridge (E-18-AO) was constructed in 1986; the structure is not yet 50-years old and was not evaluated for the purposes of Section 106.

The project may require easements or right-of-way acquisitions from up to eleven (11) properties and parcels as reflected in Figure 6 (attached), including the property at 21955 E. 160th Avenue. The remaining ten (10) properties do not contain resources that meet or exceed fifty years of age. These resources were not evaluated for NRHP eligibility and are not further addressed in this submission.

Eligibility Determinations

West Burlington Extension Ditch Segment (5AM519.2): The West Burlington Extension Ditch in Adams County was previously designated *not eligible* by SHPO in 1988. Due to the age of this determination, the subject segment was evaluated for the purpose of this project. The overall resource was not re-evaluated, but is being treated as significant to the National Register of Historic Places (NRHP) under Criterion A for its role in the development of agriculture and irrigation systems in the area northeast of Denver and within Adams County. The West Burlington Extension Ditch is part of a larger ditch system; the current Standley Lake Irrigation System, operated by the Farmer's Reservoir and Irrigation Company (FRICO). The Burlington Ditch, Reservoir and Land Company of Denver constructed the West Burlington Extension Ditch in 1894. The segment of the West Burlington Extension Ditch recorded for this project is no longer active and has been destroyed in several places, compromising integrity of design, workmanship, and materials. The area surrounding this segment is undergoing newer residential and business development, compromising integrity of setting, feeling, and association. The segment no longer supports the eligibility of the overall resource and is determined *non-supporting* of the eligibility of the overall resource 5AM519.

21955 E. 160th Avenue, Brighton, CO (5AM3125): The property contains a Ranch-style house constructed in 1957. The house is not significant to the National Register of Historic Places (NRHP) under Criterion A because it is not associated with events that have made a significant contribution to the broad pattern of our history. The farm was not part of the early agricultural history of the Brighton area. Although it is assumed that the land was once part of a larger agricultural property, encroaching development of residential and businesses on the south and north of the property indicate that the land no longer holds a significant agricultural presence. The resource is not significant under Criterion B because there are no known significant persons who lived in the house or owned the farm property. The resource is not significant under Criterion C because it does not embody the distinctive characteristics of a type, period, method of construction, or represent the work of a master. The Ranch-style was a common building type in the 1950s and 1960s, and the subject resource lacks unique features or characteristics that distinguish the style and is not an early or exceptional example. The subject resource is a modest example of the ranch type, including modest eaves, hipped roof, attached garage, and a minimal front porch. The resource lacks the horizontal emphasis that is the hallmark of the style; the vertical casement windows on the south and front facades detract from any horizontal emphasis created by the siding material. There is a lack of picture window(s), back porch or patio, sliding doors, and landscaping elements typically included with better examples of the style. The resource does not include sufficient distinctive characteristics of the Ranch type to be considered a significant example of its type, period, or method of construction and therefore is not significant under Criterion C. Finally, the resource is not significant under Criterion D

because it does not likely have the potential to yield important historical information. Because the resource lacks significance, it is determined *not eligible*.

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As a local government with a potential interest in this undertaking, we welcome your comments on these determinations. Should you elect to respond, we request you do so within thirty (30) days of receipt of these materials, as stipulated in the Section 106 regulations. For additional information on the Section 106 process, please visit the website of the Advisory Council on Historic Preservation (ACHP) at www.achp.gov. If you have questions or require additional information, please contact CDOT Region 1 Senior Staff Historian Ashley L. Bushey at 303.757.9397 or ashley.bushey@state.co.us.

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10- Charles Attardo
Region 1 Planning and Environmental Manager

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cc: **Amy Kennedy, Pinyon Environmental, Inc.**
 Lisa Schoch, CDOT Environmental Programs Branch
 File/CF

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1, Planning and Environmental
2000 South Holly Street
Denver, CO 80222
(303) 757-9929
(303) 757-9036 FAX



April 1, 2014

Adams County Planning & Development
4430 S. Adams County Parkway
1st Floor, Ste. W2000A
Brighton, CO 80601

SUBJECT: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 – Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, Colorado

Dear Adams County Planning & Development:

As you may be aware, the Colorado Department of Transportation (CDOT), Federal Highway Administration (FHWA), and the City of Brighton (Brighton) propose construction of a new interchange at I-76 and Bridge Street in Brighton, Adams County. As part of the Section 106 obligation to consider effects of the project on historic properties eligible for or listed on the National Register of Historic Places (NRHP), we are providing Planning & Development with the opportunity to comment on our effects determinations for the project.

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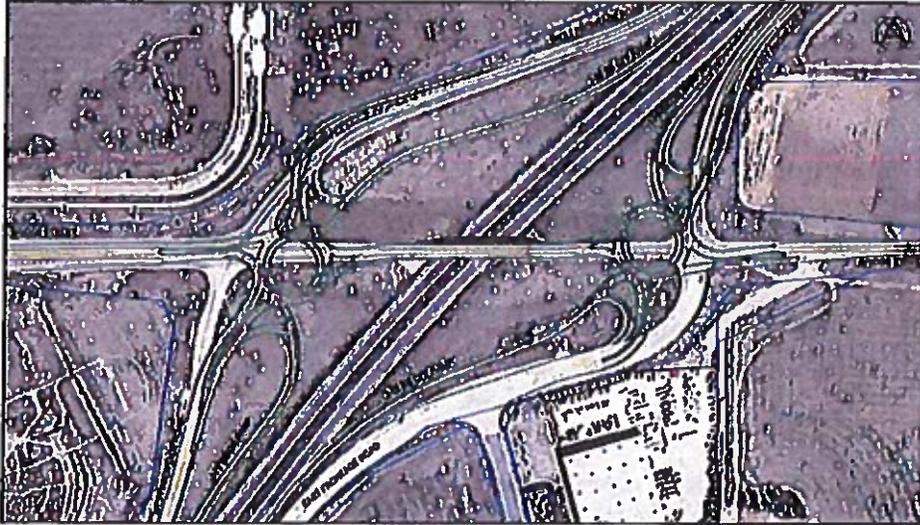
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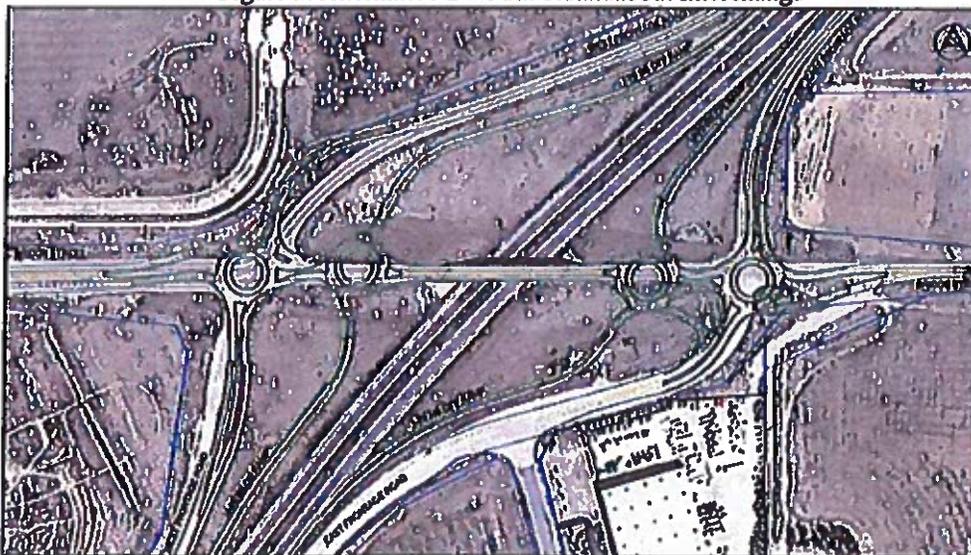
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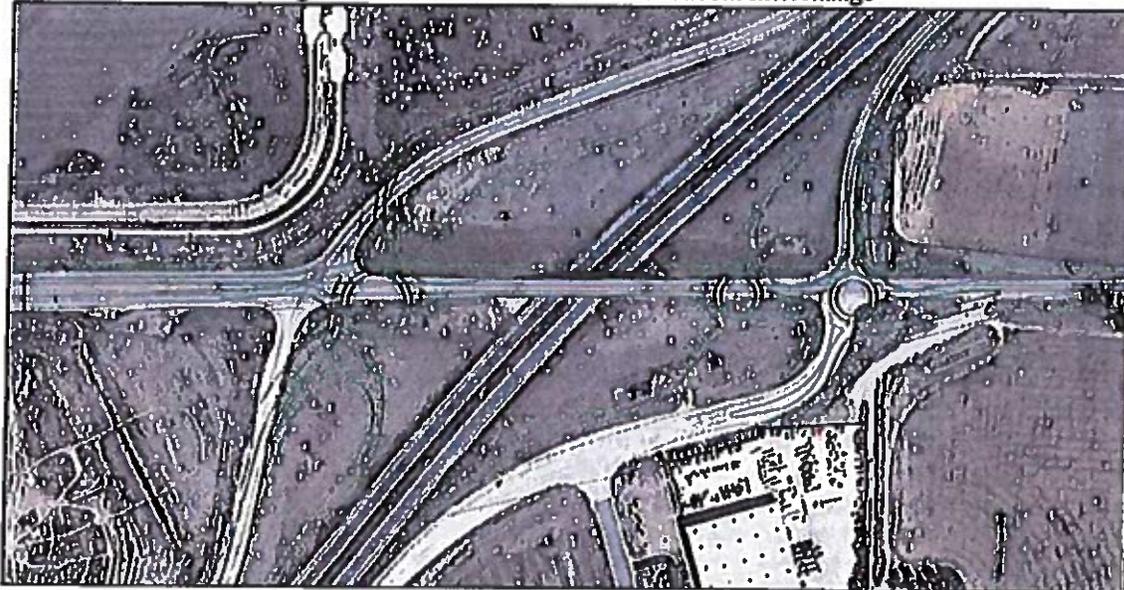


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Figure 3. Alternative 3 – Three Roundabout Interchange



Area of Potential Effects

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As a local government with a potential interest in this undertaking, we welcome your comments on these determinations. Should you elect to respond, we request you do so within thirty (30) days of receipt of these materials, as stipulated in the Section 106 regulations. For additional information on the Section 106 process, please visit the website of the Advisory Council on Historic Preservation (ACHP) at www.achp.gov. If you have questions or require additional information, please contact CDOT Region 1 Senior Staff Historian Ashley L. Bushey at 303.757.9397 or ashley.bushey@state.co.us.

Sincerely,



Charles Attardo
Region 1 Planning and Environmental Manager

Attachments: Figure 4 APE Map
Figure 5 Acquisition Map
Figure 6 Table of Acquisitions
Site Forms and supporting documentation (SAM519.2, SAM3125)

cc: Amy Kennedy, Pinon Environmental, Inc.
Lisa Schoch, CDOT Environmental Programs Branch
File/CF

April 21, 2014



Jane Hann
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 –
Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, CO
(CHS #65749)

Dear Ms. Hann,

Thank you for your correspondence dated April 1, 2014 and received by our office on April 4, 2014 regarding the review of the above-mentioned project under Section 106 of the National Historic Preservation Act (Section 106).

After review of the submitted information, we do not object to the proposed Area of Potential Effects (APE) for the project. After review of the provided survey information, we concur that resource 5AM.3125 is not eligible for the National Register of Historic Places. We concur that the entire linear resource 5AM.519 is eligible and that segment 5AM.519.2 does not retain integrity and, therefore, does not support the overall eligibility of resource 5AM.519.2. We also concur that resource 5AM.1397 is not eligible for the National Register of Historic Places.

After review of the scope of work and assessment of adverse effect, we concur with the recommended finding of *no adverse effect* [36 CFR 800.5(b)] for resource 5AM.519, including segment 5AM.519.2. We concur with the recommended finding of *no historic properties affected* [36 CFR 800.4(d)(1)] for resource 5AM.3125. No finding of effect was recommended for resource 5AM.1397; however, we recommend a finding of *no historic properties affected* [36 CFR 800.4(d)(1)]. We acknowledge that FHWA intends to make a *de minimis* determination in respect to the requirements of Section 4(f).

Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Manager, at (303) 866-4678.

Sincerely,

Edward C. Nichols
State Historic Preservation Officer

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1, Planning and Environmental
2000 South Holly Street
Denver, CO 80222
(303) 757-9929
(303) 757-9036 FAX



April 1, 2014

Mr. Edward C. Nichols
State Historic Preservation Officer
History Colorado
1200 Broadway
Denver, CO 80203

SUBJECT: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 –
Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, Colorado

Dear Mr. Nichols:

This letter and attached documents constitute a request for concurrence on Determinations of Eligibility and Effects for the project referenced above. The project involves construction of a new interchange at I-76 and Bridge Street in Brighton, Adams County. The project is a joint project of the Colorado Department of Transportation (CDOT), Federal Highway Administration (FHWA), and the City of Brighton (Brighton).

Project Description and Alternatives

The project proposes to construct a new interchange at I-76 and Bridge Street (SH7). The current I-76 overpass has no interchange at Bridge Street. Traffic currently accesses the highway via interchanges at Baseline Road (168th Avenue) or Bromley Lane (152nd Avenue). The subject project is located at mile marker 81.626 in Brighton. This interchange has been identified in Adams County's Top-Ten Ranked Urbanized Road Priority Projects. Bridge Street provides an opportunity to increase regional east-west connectivity that will become increasingly important with future population growth and increased travel demand. Four design alternatives, including a No Action Alternative, were examined as a part of this study.

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The No Action Alternative is the baseline for the other proposed alternatives. Under the No Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

Alternative #1 (Preferred Alternative)

The Preferred Alternative consists of a two roundabout interchange. This alternative combines the frontage roads and ramp terminals to make one 6-legged roundabout on both the east and west sides of I-76. The existing bridge (E-18-AO) will not be replaced. Each roundabout has an outside diameter of 200 feet including a 12-foot truck apron for truck traffic. Both roundabouts have been placed off center of the existing Bridge Street centerline to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-

foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 1. Preferred Alternative – Two Roundabout Interchange



Alternative #2 Four Roundabout Interchange Design

Alternative 2 is a four roundabout interchange. This alternative creates two (4-legged) roundabouts on each side (east and west) of I-76. The existing bridge (E-18-AO) will not be replaced. The two 4-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 110 feet, including a 12-foot truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts have been placed off center of the existing Bridge Street center line slightly to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 2. Alternative 2 – Four Roundabout Interchange

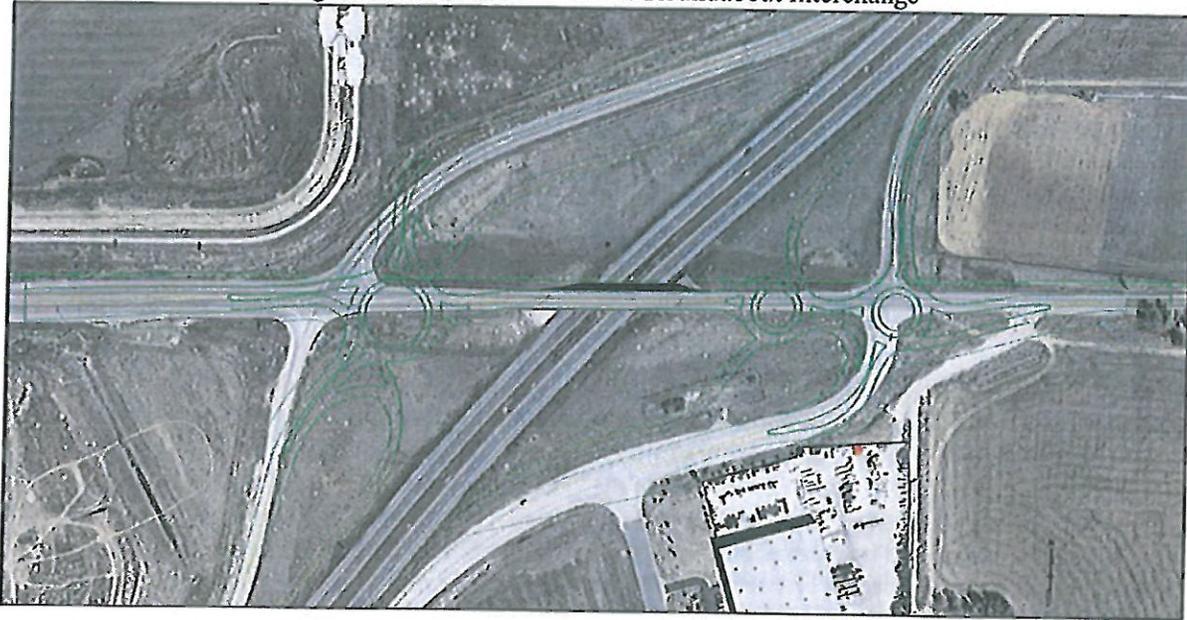


Alternative #3 Three Roundabout Interchange Design

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76. The west frontage road and I-76 westbound ramps are combined into one 6-legged roundabout with an outside diameter of 200 feet including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one 4-legged roundabout and the frontage roads into a 4-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet including a 12-foot truck apron. This preserves the existing bridge and has minor right of way impacts, primarily to the east. The two 4-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

There are no plans for widening the frontage road to accommodate the improvements and currently decisions for new curbs, gutters, and drainage will be decided with the final design. There are no proposed changes to I-76.

Figure 3. Alternative 3 – Three Roundabout Interchange



Area of Potential Effects

The APE was developed to account for direct and indirect effects created by the project and encompasses the project limits and historic boundaries for resources intersected or affected by the project. Because the project limits for alternatives are very close, the APE was drawn to encompass the limits of all three alternatives. Please refer to Figure 4 (APE Map) for additional information.

Survey Methodology

A search of the COMPASS database was completed, indicating the APE includes the West Burlington Canal Culvert (5AM1397). No additional, previously recorded historic resources were identified within the APE. A search of the Adams County Assessor's records was completed to identify construction dates for resources within the APE. Two unrecorded resources were identified: a segment of the West

Burlington Extension Ditch and a property at 21955 E. 160th Avenue, containing a house constructed in 1957. Additional research on these resources was completed at the Denver Public Library, Adams County Records Office, and a site visit was completed by a historian from Pinyon Environmental.

The resource located at 21955 E. 160th Avenue was evaluated using OAHF Form 1403. The West Burlington Extension Ditch segment was evaluated using OAHF Forms 1400 and 1418. The Bridge Street Bridge (E-18-AO) was constructed in 1986; the structure is not yet 50-years old and was not evaluated for the purposes of Section 106.

The project may require easements or right-of-way acquisitions from up to eleven (11) properties and parcels as reflected in Figure 6 (attached), including the property at 21955 E. 160th Avenue. The remaining ten (10) properties do not contain resources that meet or exceed fifty years of age. These resources were not evaluated for NRHP eligibility and are not further addressed in this submission.

Eligibility Determinations

West Burlington Extension Ditch Segment (5AM519.2): The West Burlington Extension Ditch in Adams County was previously designated *not eligible* by SHPO in 1988. Due to the age of this determination, the subject segment was evaluated for the purpose of this project. The overall resource was not re-evaluated, but is being treated as significant to the National Register of Historic Places (NRHP) under Criterion A for its role in the development of agriculture and irrigation systems in the area northeast of Denver and within Adams County. The West Burlington Extension Ditch is part of a larger ditch system; the current Standley Lake Irrigation System, operated by the Farmer's Reservoir and Irrigation Company (FRICO). The Burlington Ditch, Reservoir and Land Company of Denver constructed the West Burlington Extension Ditch in 1894. The segment of the West Burlington Extension Ditch recorded for this project is no longer active and has been destroyed in several places, compromising integrity of design, workmanship, and materials. The area surrounding this segment is undergoing newer residential and business development, compromising integrity of setting, feeling, and association. The segment no longer supports the eligibility of the overall resource and is determined *non-supporting* of the eligibility of the overall resource 5AM519.

21955 E. 160th Avenue, Brighton, CO (5AM3125): The property contains a Ranch-style house constructed in 1957. The house is not significant to the National Register of Historic Places (NRHP) under Criterion A because it is not associated with events that have made a significant contribution to the broad pattern of our history. The farm was not part of the early agricultural history of the Brighton area. Although it is assumed that the land was once part of a larger agricultural property, encroaching development of residential and businesses on the south and north of the property indicate that the land no longer holds a significant agricultural presence. The resource is not significant under Criterion B because there are no known significant persons who lived in the house or owned the farm property. The resource is not significant under Criterion C because it does not embody the distinctive characteristics of a type, period, method of construction, or represent the work of a master. The Ranch-style was a common building type in the 1950s and 1960s, and the subject resource lacks unique features or characteristics that distinguish the style and is not an early or exceptional example. The subject resource is a modest example of the ranch type, including modest eaves, hipped roof, attached garage, and a minimal front porch. The resource lacks the horizontal emphasis that is the hallmark of the style; the vertical casement windows on the south and front facades detract from any horizontal emphasis created by the siding material. There is a lack of picture window(s), back porch or patio, sliding doors, and landscaping elements typically included with better examples of the style. The resource does not include sufficient distinctive characteristics of the Ranch type to be considered a significant example of its type, period, or method of construction and therefore is not significant under Criterion C. Finally, the resource is not significant under Criterion D

because it does not likely have the potential to yield important historical information. Because the resource lacks significance, it is determined *not eligible*.

West Burlington Canal Culvert (5AM1397): The West Burlington Canal Culvert (5AM1397) carries the West Burlington Extension Ditch under I-76. The culvert was constructed in 1935 and determined *officially not eligible* in 2002 as part of the Colorado Historic Bridge Inventory.

Effects Determination

West Burlington Extension Ditch Segment (5AM519.2): The resource intersects the project limits; however, no part of the ditch will be disturbed during construction. Construction of a new interchange including on-ramps, off-ramps, and roundabouts will introduce new visual elements to the setting. Because the subject segment retains minimal integrity and has been determined *non-supporting*, the project will result in a finding of *no adverse effect* with regard to the resource 5AM519, including segment 5AM519.2

21955 E. 160th Avenue, Brighton, CO (5AM3125): The subject property is located east of the proposed interchange of I-76 and Bridge Street. All three Action Alternatives include the acquisitions from the western portion of the property as well as a temporary easement to accommodate the construction stage, as reflected in the table below.

Alternative	Permanent Acquisition	Temporary Easement
#1 Preferred Alternative	990.66 square feet (0.023 acres)	765.99 square feet (0.018 acres)
#2 Alternative	155 square feet (0.004 acres)	378 square feet (0.009 acres)
#3 Alternative	155.09 square feet (0.004 acres)	380.29 square feet (0.009 acres)

Please refer to the attached map (Figure 5) for visual representations of the acquisitions on the property. Because the resource is determined *not eligible*, the project will result in a finding of *no historic properties affected*.

Notification of Section 4(f) De Minimis Determination

This project has been determined to have *no adverse effect* to the West Burlington Extension Ditch (5AM519), including segment 5AM519.2. Based on this finding, FHWA may make a determination of de minimis finding for the Section 4(f) requirements for this historic resource.

We request your concurrence with these determinations of eligibility and effects outlined above and acknowledgement of the potential Section 4(f) de minimis finding. Thank you in advance for your prompt attention to this matter. If you require additional information, please contact Region 1 Historian Ashley L. Bushey at (303) 757-9397 or ashley.bushey@state.co.us.

Sincerely,



Charles Attardo
Region 1 Planning and Environmental Manager

Attachments: Figure 4 APE Map
Figure 5 Acquisition Map
Figure 6 Table of Acquisitions
Site Forms and supporting
documentation (5AM519.2, 5AM3125)

cc: Amy Kennedy, Pinyon Environmental, Inc.
Lisa Schoch, CDOT Environmental Programs
Branch
File/CF

Figure 4.
I-76 and Bridge Street APE

Legend



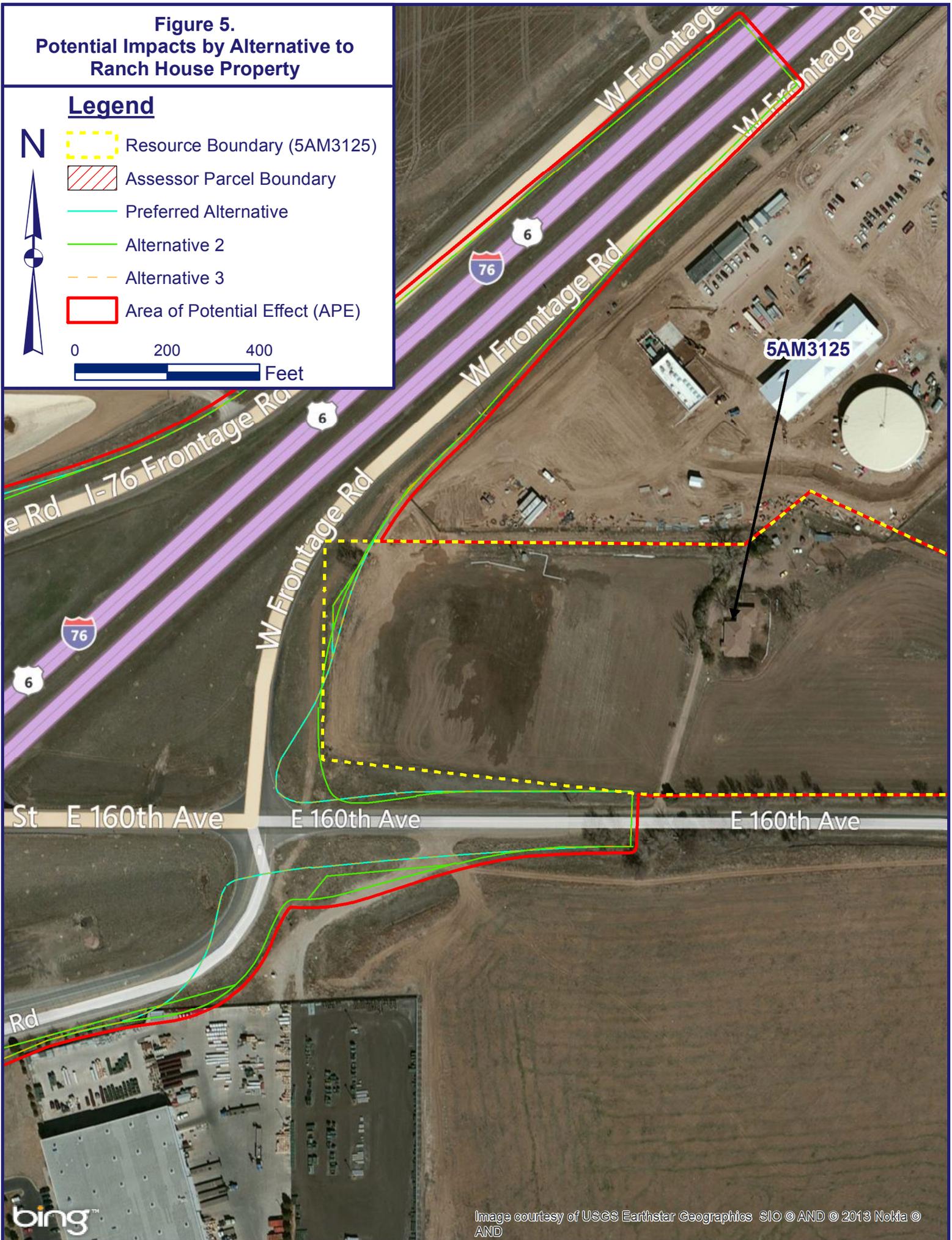
-  West Burlington Extension Ditch
 -  West Burlington Extension Ditch (Altered)
 -  Speer Canal
 -  Area of Potential Effect (APE)
 -  Historic Resource Boundary (5AM3125)
- 0 500 1,000
Feet



Figure 5.
Potential Impacts by Alternative to
Ranch House Property

Legend

-  N
 -  Resource Boundary (5AM3125)
 -  Assessor Parcel Boundary
 -  Preferred Alternative
 -  Alternative 2
 -  Alternative 3
 -  Area of Potential Effect (APE)
- 0 200 400
 Feet



City of Brighton Historic Preservation Commission Consultation



City of Brighton
500 South 4th Avenue
Brighton, CO 80601
303-655-2000 Office
www.brightonco.gov

April 17, 2014

Region 1. Planning and Environmental
Attn: Charles Attardo – Region 1 Planning and Environmental Manager
2000 South Holly Street
Denver, CO 80222
(303) 757-9929

**RE: Brighton Historic Preservation Section 106 Review
I-76 & Bridge Street Interchange – Project Number: CC 0761-202/17313**

Dear Mr. Attardo;

On April 4, 2014 packet was received requesting a Section 106 Review of four different alternatives (one without change) for the Interchange at Interstate 76 and Bridge Street.

After review of the proposed alternatives and performing additional property research, staff finds that the three proposals for change will not negatively impact the historic significance of the area. The three potential historic resources are not eligible for historic designation because of their lack of integrity or historical value. In addition, your report indicates that the interchange proposals will not physically modify the resources. While, the visual setting of all three resources will be impacted with the changes, this has already occurred through the approval and future construction of surrounding development.

Please note that this review is separate from the planning and permitting review process required by regulation within the Municipal Code. The above response is specific to your request of historic impact.

Thank you for consulting with the City of Brighton during the planning process. Please feel free to contact me if you need further assistance.

Sincerely,

Aja Tibbs

Long Range & Historic Preservation Planner
Community Development Department
City of Brighton
303-655-2015
atibbs@brightonco.gov

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1, Planning and Environmental
2000 South Holly Street
Denver, CO 80222
(303) 757-9929
(303) 757-9036 FAX



April 1, 2014

Ms. Aja Tibbs, Long Range & Historic Preservation Planner
City of Brighton Historic Preservation Commission
500 South 4th Avenue
Brighton, CO 80601

SUBJECT: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 –
Environmental Assessment I-76 and Bridge Street (State Highway 7), Adams County, Colorado

Dear Ms. Tibbs:

As you may be aware, the Colorado Department of Transportation (CDOT), Federal Highway Administration (FHWA), and the City of Brighton (Brighton) propose construction of a new interchange at I-76 and Bridge Street in Brighton, Adams County. As part of the Section 106 obligation to consider effects of the project on historic properties eligible for or listed on the National Register of Historic Places (NRHP), we are providing the City of Brighton Historic Preservation Commission with the opportunity to comment on our effects determinations for the project.

Project Description and Alternatives

The project proposes to construct a new interchange at I-76 and Bridge Street (SH7). The current I-76 overpass has no interchange at Bridge Street. Traffic currently accesses the highway via interchanges at Baseline Road (168th Avenue) or Bromley Lane (152nd Avenue). The subject project is located at mile marker 81.626 in Brighton. This interchange has been identified in Adams County's Top-Ten Ranked Urbanized Road Priority Projects. Bridge Street provides an opportunity to increase regional east-west connectivity that will become increasingly important with future population growth and increased travel demand. Four design alternatives, including a No Action Alternative, were examined as a part of this study.

No Action Alternative

The No Action Alternative is the baseline for the other proposed alternatives. Under the No Action Alternative, no further improvements, aside from ongoing operations and maintenance, would be made to the Bridge Street overpass at I-76.

Alternative #1 (Preferred Alternative)

The Preferred Alternative consists of a two roundabout interchange. This alternative combines the frontage roads and ramp terminals to make one 6-legged roundabout on both the east and west sides of I-76. The existing bridge (E-18-AO) will not be replaced. Each roundabout has an outside diameter of 200 feet including a 12-foot truck apron for truck traffic. Both roundabouts have been placed off center of the existing Bridge Street centerline to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-

foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 1. Preferred Alternative – Two Roundabout Interchange



Alternative #2 Four Roundabout Interchange Design

Alternative 2 is a four roundabout interchange. This alternative creates two (4-legged) roundabouts on each side (east and west) of I-76. The existing bridge (E-18-AO) will not be replaced. The two 4-legged roundabouts on the east and west side of I-76 allow truck traffic to be separated from residential traffic. Each roundabout has an outside diameter of 110 feet, including a 12-foot truck apron for truck traffic. With each pairing on the west and east sides, the roundabouts have been placed off center of the existing Bridge Street center line slightly to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

Figure 2. Alternative 2 – Four Roundabout Interchange

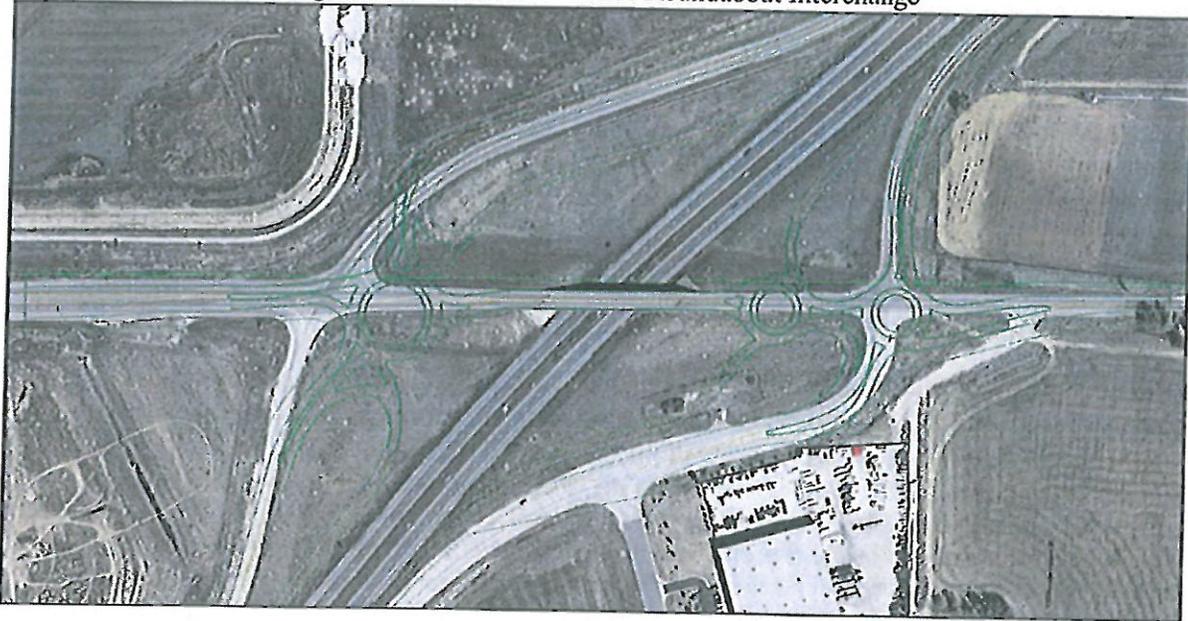


Alternative #3 Three Roundabout Interchange Design

This alternative consists of one large roundabout on the west side of I-76 and two smaller roundabouts on the east side of I-76. The west frontage road and I-76 westbound ramps are combined into one 6-legged roundabout with an outside diameter of 200 feet including a 12-foot truck apron. The east side combines the eastbound ramp terminal into one 4-legged roundabout and the frontage roads into a 4-legged roundabout. Each of the smaller roundabouts has an outside diameter of 150 feet including a 12-foot truck apron. This preserves the existing bridge and has minor right of way impacts, primarily to the east. The two 4-legged roundabouts on the east side of I-76 allow truck traffic to be separated from residential traffic. For the pairing on the east side and the single roundabout on the west side, the roundabouts have been placed off center of the existing Bridge Street center line to develop approach angles as a traffic calming technique. Splitter islands are included to slow traffic coming into the roundabouts. The roundabouts are designed with 18-foot single lane for circulation and exclusive right turn by-passes for the ramp to frontage road and frontage road to ramp movements.

There are no plans for widening the frontage road to accommodate the improvements and currently decisions for new curbs, gutters, and drainage will be decided with the final design. There are no proposed changes to I-76.

Figure 3. Alternative 3 – Three Roundabout Interchange



Area of Potential Effects

The APE was developed to account for direct and indirect effects created by the project and encompasses the project limits and historic boundaries for resources intersected or affected by the project. Because the project limits for alternatives are very close, the APE was drawn to encompass the limits of all three alternatives. Please refer to Figure 4 (APE Map) for additional information.

Survey Methodology

A search of the COMPASS database was completed, indicating the APE includes the West Burlington Canal Culvert (5AM1397). No additional, previously recorded historic resources were identified within the APE. A search of the Adams County Assessor's records was completed to identify construction dates for resources within the APE. Two unrecorded resources were identified: a segment of the West

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The project may require easements or right-of-way acquisitions from up to eleven (11) properties and parcels as reflected in Figure 6 (attached), including the property at 21955 E. 160th Avenue. The remaining ten (10) properties do not contain resources that meet or exceed fifty years of age. These resources were not evaluated for NRHP eligibility and are not further addressed in this submission.

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21955 E. 160th Avenue, Brighton, CO (5AM3125): The property contains a Ranch-style house constructed in 1957. The house is not significant to the National Register of Historic Places (NRHP) under Criterion A because it is not associated with events that have made a significant contribution to the broad pattern of our history. The farm was not part of the early agricultural history of the Brighton area. Although it is assumed that the land was once part of a larger agricultural property, encroaching development of residential and businesses on the south and north of the property indicate that the land no longer holds a significant agricultural presence. The resource is not significant under Criterion B because there are no known significant persons who lived in the house or owned the farm property. The resource is not significant under Criterion C because it does not embody the distinctive characteristics of a type, period, method of construction, or represent the work of a master. The Ranch-style was a common building type in the 1950s and 1960s, and the subject resource lacks unique features or characteristics that distinguish the style and is not an early or exceptional example. The subject resource is a modest example of the ranch type, including modest eaves, hipped roof, attached garage, and a minimal front porch. The resource lacks the horizontal emphasis that is the hallmark of the style; the vertical casement windows on the south and front facades detract from any horizontal emphasis created by the siding material. There is a lack of picture window(s), back porch or patio, sliding doors, and landscaping elements typically included with better examples of the style. The resource does not include sufficient distinctive characteristics of the Ranch type to be considered a significant example of its type, period, or method of construction and therefore is not significant under Criterion C. Finally, the resource is not significant under Criterion D

because it does not likely have the potential to yield important historical information. Because the resource lacks significance, it is determined *not eligible*.

West Burlington Canal Culvert (5AM1397): The West Burlington Canal Culvert (5AM1397) carries the West Burlington Extension Ditch under I-76. The culvert was constructed in 1935 and determined *officially not eligible* in 2002 as part of the Colorado Historic Bridge Inventory.

Effects Determination

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Please refer to the attached map (Figure 5) for visual representations of the acquisitions on the property. Because the resource is determined *not eligible*, the project will result in a finding of *no historic properties affected*.

Notification of Section 4(f) De Minimis Determination

This project has been determined to have *no adverse effect* to the West Burlington Extension Ditch (5AM519), including segment 5AM519.2. Based on this finding, FHWA may make a determination of de minimis finding for the Section 4(f) requirements for this historic resource.

As a local government with a potential interest in this undertaking, we welcome your comments on these determinations. Should you elect to respond, we request you do so within thirty (30) days of receipt of these materials, as stipulated in the Section 106 regulations. For additional information on the Section 106 process, please visit the website of the Advisory Council on Historic Preservation (ACHP) at www.achp.gov. If you have questions or require additional information, please contact CDOT Region 1 Senior Staff Historian Ashley L. Bushey at 303.757.9397 or ashley.bushey@state.co.us.

Sincerely,



for Charles Attardo
Region 1 Planning and Environmental Manager

Attachments: Figure 4 APE Map
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Site Forms and supporting documentation (5AM519.2, 5AM3125)

cc: Amy Kennedy, Pinyon Environmental, Inc.
Lisa Schoch, CDOT Environmental Programs Branch
File/CF

**Adams County Planning and Development Consultation on Historic
Resources**

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1, Planning and Environmental
2000 South Holly Street
Denver, CO 80222
(303) 757-9929
(303) 757-9036 FAX



April 1, 2014

Adams County Planning & Development
4430 S. Adams County Parkway
1st Floor, Ste. W2000A
Brighton, CO 80601

SUBJECT: Determinations of Eligibility and Effects, Project Number: CC 0761-202/17313 –
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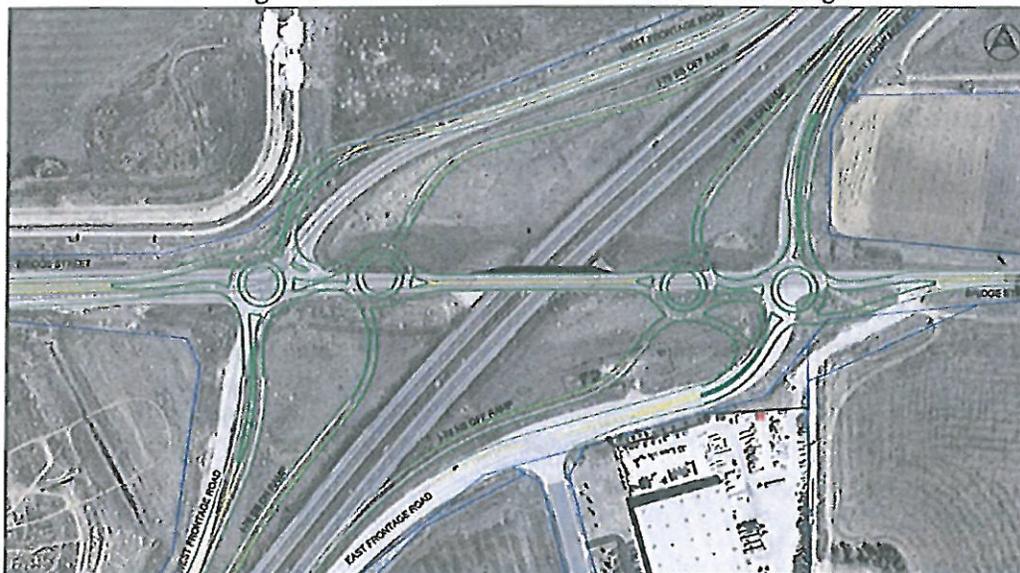
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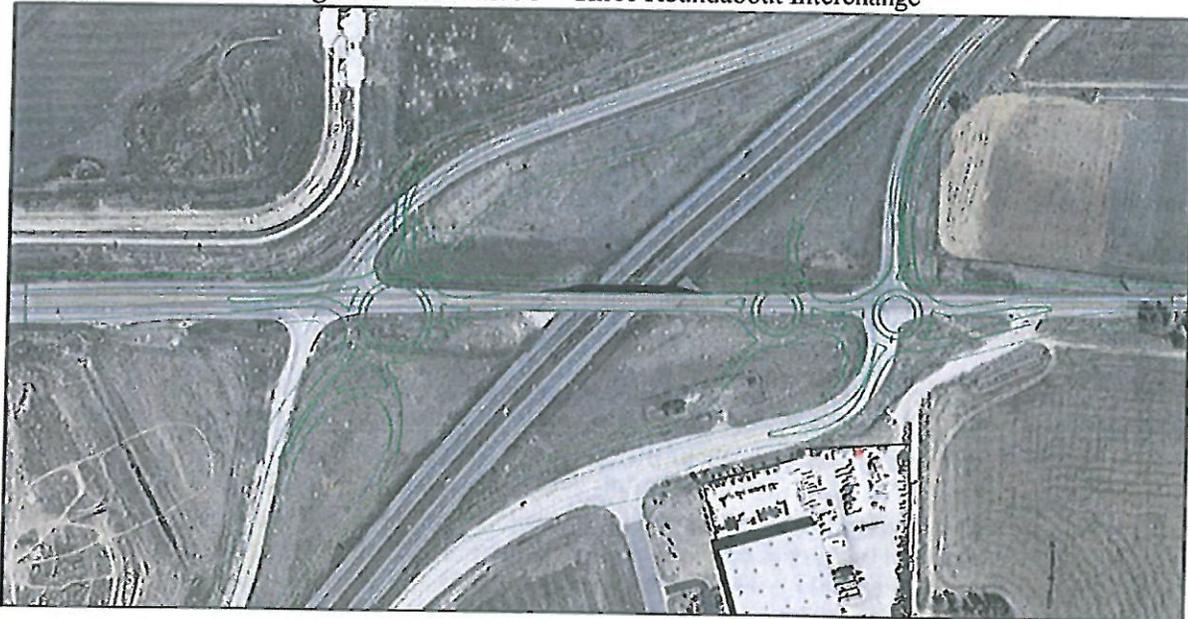


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The project may require easements or right-of-way acquisitions from up to eleven (11) properties and parcels as reflected in Figure 6 (attached), including the property at 21955 E. 160th Avenue. The remaining ten (10) properties do not contain resources that meet or exceed fifty years of age. These resources were not evaluated for NRHP eligibility and are not further addressed in this submission.

Eligibility Determinations

West Burlington Extension Ditch Segment (5AM519.2): The West Burlington Extension Ditch in Adams County was previously designated *not eligible* by SHPO in 1988. Due to the age of this determination, the subject segment was evaluated for the purpose of this project. The overall resource was not re-evaluated, but is being treated as significant to the National Register of Historic Places (NRHP) under Criterion A for its role in the development of agriculture and irrigation systems in the area northeast of Denver and within Adams County. The West Burlington Extension Ditch is part of a larger ditch system; the current Standley Lake Irrigation System, operated by the Farmer's Reservoir and Irrigation Company (FRICO). The Burlington Ditch, Reservoir and Land Company of Denver constructed the West Burlington Extension Ditch in 1894. The segment of the West Burlington Extension Ditch recorded for this project is no longer active and has been destroyed in several places, compromising integrity of design, workmanship, and materials. The area surrounding this segment is undergoing newer residential and business development, compromising integrity of setting, feeling, and association. The segment no longer supports the eligibility of the overall resource and is determined *non-supporting* of the eligibility of the overall resource 5AM519.

21955 E. 160th Avenue, Brighton, CO (5AM3125): The property contains a Ranch-style house constructed in 1957. The house is not significant to the National Register of Historic Places (NRHP) under Criterion A because it is not associated with events that have made a significant contribution to the broad pattern of our history. The farm was not part of the early agricultural history of the Brighton area. Although it is assumed that the land was once part of a larger agricultural property, encroaching development of residential and businesses on the south and north of the property indicate that the land no longer holds a significant agricultural presence. The resource is not significant under Criterion B because there are no known significant persons who lived in the house or owned the farm property. The resource is not significant under Criterion C because it does not embody the distinctive characteristics of a type, period, method of construction, or represent the work of a master. The Ranch-style was a common building type in the 1950s and 1960s, and the subject resource lacks unique features or characteristics that distinguish the style and is not an early or exceptional example. The subject resource is a modest example of the ranch type, including modest eaves, hipped roof, attached garage, and a minimal front porch. The resource lacks the horizontal emphasis that is the hallmark of the style; the vertical casement windows on the south and front facades detract from any horizontal emphasis created by the siding material. There is a lack of picture window(s), back porch or patio, sliding doors, and landscaping elements typically included with better examples of the style. The resource does not include sufficient distinctive characteristics of the Ranch type to be considered a significant example of its type, period, or method of construction and therefore is not significant under Criterion C. Finally, the resource is not significant under Criterion D

because it does not likely have the potential to yield important historical information. Because the resource lacks significance, it is determined *not eligible*.

West Burlington Canal Culvert (5AM1397): The West Burlington Canal Culvert (5AM1397) carries the West Burlington Extension Ditch under I-76. The culvert was constructed in 1935 and determined *officially not eligible* in 2002 as part of the Colorado Historic Bridge Inventory.

Effects Determination

West Burlington Extension Ditch Segment (5AM519.2): The resource intersects the project limits; however, no part of the ditch will be disturbed during construction. Construction of a new interchange including on-ramps, off-ramps, and roundabouts will introduce new visual elements to the setting. Because the subject segment retains minimal integrity and has been determined *non-supporting*, the project will result in a finding of *no adverse effect* with regard to the resource 5AM519, including segment 5AM519.2

21955 E. 160th Avenue, Brighton, CO (5AM3125): The subject property is located east of the proposed interchange of I-76 and Bridge Street. All three Action Alternatives include the acquisitions from the western portion of the property as well as a temporary easement to accommodate the construction stage, as reflected in the table below.

Alternative	Permanent Acquisition	Temporary Easement
#1 Preferred Alternative	990.66 square feet (0.023 acres)	765.99 square feet (0.018 acres)
#2 Alternative	155 square feet (0.004 acres)	378 square feet (0.009 acres)
#3 Alternative	155.09 square feet (0.004 acres)	380.29 square feet (0.009 acres)

Please refer to the attached map (Figure 5) for visual representations of the acquisitions on the property. Because the resource is determined *not eligible*, the project will result in a finding of *no historic properties affected*.

Notification of Section 4(f) De Minimis Determination

This project has been determined to have *no adverse effect* to the West Burlington Extension Ditch (5AM519), including segment 5AM519.2. Based on this finding, FHWA may make a determination of de minimis finding for the Section 4(f) requirements for this historic resource.

As a local government with a potential interest in this undertaking, we welcome your comments on these determinations. Should you elect to respond, we request you do so within thirty (30) days of receipt of these materials, as stipulated in the Section 106 regulations. For additional information on the Section 106 process, please visit the website of the Advisory Council on Historic Preservation (ACHP) at www.achp.gov. If you have questions or require additional information, please contact CDOT Region 1 Senior Staff Historian Ashley L. Bushey at 303.757.9397 or ashley.bushey@state.co.us.

Sincerely,



Charles Attardo
Region 1 Planning and Environmental Manager

Attachments: Figure 4 APE Map
Figure 5 Acquisition Map
Figure 6 Table of Acquisitions
Site Forms and supporting documentation (5AM519.2, 5AM3125)

cc: Amy Kennedy, Pinyon Environmental, Inc.
Lisa Schoch, CDOT Environmental Programs Branch
File/CF

Native American Tribal Consultation



STATE OF
COLORADO

Jepson - CDOT, Daniel <daniel.jepson@state.co.us>

Interstate 76/Bridge Street Interchange

1 message

Jimmy Arterberry <jimmya@comanchenation.com>

Wed, Jan 22, 2014 at 11:21 AM

To: "daniel.jepson@state.co.us" <daniel.jepson@state.co.us>

In response to your request, the above referenced project has been reviewed by staff of this office. Based on the information provided and a search within the Comanche Nation Site Files, we have determined that there are **no properties** affected by the proposed undertaking.

If you require additional information or are in need of further assistance, please contact this office at (580) 595-9960 or 9618.

This review is performed in order to identify and preserve the Comanche Nation and State's cultural heritage, in conjunction with the State Historic Preservation Office.

Jimmy W. Arterberry, THPO
Comanche Nation
P.O. Box 908
Lawton, Oklahoma 73502
(580) 595-9960 or 9618
(580) 595-9733 FAX

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U.S. Department
of Transportation
**Federal Highway
Administration**

Colorado Division

January 9, 2014

12300 W. Dakota Ave., Ste. 180
Lakewood, Colorado 80228
720-963-3000

Donnie Cabaniss, Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

**Subject: Request for Section 106 Consultation, Interstate 76/Bridge Street Interchange
Environmental Assessment, Adams County, Colorado**

Dear Chairman Cabaniss:

The Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT), in cooperation with the City of Brighton, Colorado, are preparing an Environmental Assessment (EA) that will address the effects of proposed construction of an interchange at Interstate 76 and Bridge Street, approximately 25 miles northeast of Denver (Figure: 1). The purpose of the project is to increase local and regional east-west connectivity, reduce travel delay, and improve traffic flow and access in a quickly expanding commercial and residential area. An overpass spanning I-76 presently exists but the project will add both eastbound and westbound entrance and exit ramps, as well as reconfigure the overpass to include traffic roundabouts (Figure: Alternative 1b). Pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) implementing regulations (40 CFR 1500-1508), FHWA and CDOT are documenting the potential social, economic and environmental consequences of this action.

FHWA will serve as the lead agency for this undertaking and CDOT staff will facilitate the tribal consultation process. As a consulting party under the Section 106 regulations, you are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. Further, if it is found that the project will impact cultural resources that are eligible for inclusion on the National Register of Historic Places and are of religious or cultural significance to your tribe, your role in the consultation process would include participation in resolving how best to avoid, minimize, or mitigate those impacts. It is our hope that by describing the proposed undertaking we can be more effective in protecting areas important to American Indian people.

The project area is located almost entirely within the existing I-76 right-of-way, which is a largely disturbed shortgrass prairie environment. **No sites exhibiting evidence of Native American occupation are present within or near the project area.** However, any information you may have regarding places or sites important to your tribe that are located in proximity to the project area would assist us in our efforts to comprehensively identify and evaluate historic properties.

We are committed to ensuring that tribal governments are informed of and involved in decisions that may impact places with cultural significance. If you have specific interest in the I-76/Bridge Street Interchange project, please complete and return the enclosed Consultation Interest Response Form to CDOT Native American consultation liaison Dan Jepson **within 30 days** via US Mail, fax or email, as listed at the bottom of that sheet. The 30-day period has been established to encourage your participation at this early stage in project development. Failure to respond within this time frame will not prevent your tribe from entering consultation at a later date. However, studies and decision making will proceed and it may be difficult to reconsider previous determinations or findings, unless significant new information is introduced.

If you have questions or concerns about the project or the role of your tribe in the consultation process, please contact Dan Jepson at 303-757-9631 or daniel.jepson@state.co.us, or FHWA Colorado Division Environmental Program Manager Stephanie Gibson at 720-963-3013 or stephanie.gibson@dot.gov.

Thank you for considering this request for consultation.

Sincerely Yours,



John M. Cater, P.E.
Division Administrator

By: Monica Pavlik, P.E.
Senior Operations Engineer

Enclosures: Maps Showing Project Area
Consultation Interest Response Form

Cc: S. Gibson & M. Pavlik, FHWA
A. Eilers, CDOT Region 1
K. DePinto, Atkins
A. Kennedy, Pinyon Environmental

TRIBAL MAILING LIST
I-76/Bridge Street Interchange EA

Tribal Chair (Primary Contact):	Send Copy of Letter and Attachments to:
<p>Mr. Donnie Cabaniss, Chairman Apache Tribe of Oklahoma P.O. Box 1330 Anadarko, OK 73005</p>	<p>N/A</p>
<p>Ms. Janice Prairie Chief-Boswell, Chairwoman Cheyenne and Arapaho Tribes of Oklahoma P.O. Box 38 Concho, OK 73022</p>	<p>Mr. Dale Hamilton, Arapaho Director Cultural Heritage Program Cheyenne and Arapaho Tribes of Oklahoma P.O. Box 145 Concho, OK 73022</p> <p>Ms. Karen Little-Coyote, Cheyenne Director Cultural Heritage Program Cheyenne and Arapaho Tribes of Oklahoma P.O. Box 145 Concho, OK 73022</p>
<p>Ms. Amber Toppah, Chairwoman Kiowa Business Committee Kiowa Tribe of Oklahoma P.O. Box 369 Carnegie, OK 73015</p>	<p>Ms. Amie Tah-bone, NAGPRA Representative Kiowa Tribe of Oklahoma P.O. Box 369 Carnegie, OK 73015</p>
<p>Mr. Darryl O'Neal, Sr., Chairman Northern Arapaho Business Council Northern Arapaho Tribe P.O. Box 396 Fort Washakie, WY 82514</p>	<p>Ms. Darlene Conrad, THPO Northern Arapaho Tribe P.O. Box 396 Ft. Washakie, WY 82514</p>
<p>Mr. John Robinson, President Northern Cheyenne Tribal Council Northern Cheyenne Tribe P.O. Box 128 Lame Deer, MT 59043</p>	<p>Mr. Conrad Fisher, THPO Northern Cheyenne Tribe P.O. Box 128 Lame Deer, MT 59043</p>
<p>Mr. Cyril Scott, President Rosebud Sioux Tribe P.O. Box 430 Rosebud, SD 57570</p>	<p>Mr. Russell Eagle Bear, NAGPRA Coordinator Rosebud Sioux Tribe P.O. Box 430 Rosebud, SD 57570</p>
<p>Mr. Charles Murphy, Chairman Standing Rock Sioux Tribal Council Standing Rock Sioux Tribe P.O. Box D Fort Yates, ND 58538</p>	<p>Ms. Waste' Win Young, THPO Standing Rock Sioux Tribe P.O. Box D Fort Yates, ND 58538</p>
<p>Mr. Kevin Keckler, Chairman Cheyenne River Sioux Tribe P.O. Box 590 Eagle Butte, SD 57625</p>	<p>Mr. Steve Vance, THPO Cheyenne River Sioux Tribe P.O. Box 590 Eagle Butte, SD 57625</p>
<p>Mr. Wallace Coffey, Chairman % Comanche Tribal Business Committee Comanche Nation of Oklahoma P.O. Box 908 Lawton, OK 73502</p>	<p>Mr. Jimmy Arterberry, THPO Comanche Nation of Oklahoma P.O. Box 908 Lawton, OK 73502</p>
<p>Mr. Wilfred Keeble, Chairman Crow Creek Sioux Tribal Council P.O. Box 50 Fort Thompson, SD 57339</p>	<p>Ms. Wanda Wells, THPO Crow Creek Sioux Tribe P.O. Box 50 Fort Thompson, SD 57339</p>

Mr. Bryan Brewer, President Oglala Sioux Tribal Council Oglala Sioux Tribe P.O. Box 2070 Pine Ridge, SD 57770	Mr. Willmar Mesteph, THPO Oglala Sioux Tribe P.O. Box 419 Pine Ridge, SD 57770
Mr. Marshall R. Gover, President Pawnee Nation of Oklahoma 881 Little Dee Drive Pawnee, OK 74058	Mr. Gordon Adams, THPO Pawnee Nation of Oklahoma P.O. Box 470 Pawnee, OK 74058
CDOT Region & Consultant (Send copies of one letter and the mailing list to):	
Aaron Eilers, CDOT Region 1 Environmental	
Mr. Ken DePinto, Project Manager 4601 DTC Blvd., Ste. 700 Denver, CO 80237	
Ms. Amy Kennedy Pinyon Environmental 9100 W. Jewell, Ste. 200 Lakewood, CO 80232	

Colorado Department of Transportation Paleontological Resources Memo

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9632
FAX (303) 757-9445



DATE: 26 December 2013

TO: Aaron Eilers

FROM: F. Nicole Peavey

SUBJECT: Paleontological assessment for the I-76 and Bridge Street Interchange

INTRODUCTION

The I-76 and Bridge Street Interchange Project has been proposed by the City of Brighton to increase local and regional east-west connectivity, reduce travel delay, and improve traffic flow and access in the immediate area surrounding the proposed interchange at the intersection of I-76 and Bridge Street (SH 7). This report documents preliminary consideration of the paleontological sensitivity of the project area. No on-the-ground reconnaissance was conducted for this report, as the project study area did not show sufficient topography, bedrock outcrops or soft sediment outcrops upon remote inspection to warrant a pre-construction survey of the project area. Conclusions herein have been based on searches of published maps and literature as well as museum fossil locality databases.

PROJECT AREA GEOLOGY AND PALEONTOLOGY

The geologic units mapped (Soister 1965; Trimble and Machette 1969) within the approximate project study area are, from youngest to oldest:

<u>Unit</u>	<u>Age</u>
Qp – Post-Piney Creek and Piney Creek Alluvium	Late Holocene
Qal – Unnamed alluvium	Holocene
Qes – Unnamed eolian sand	Holocene to late Pleistocene
Ql – Unnamed Loess	Pleistocene
Qsg – Unnamed river sand and gravel	Pleistocene
Qs – Slocum Alluvium	Middle Pleistocene
Qv – Verdos Alluvium	Middle Pleistocene
TKd – Denver Formation	Paleocene to Late Cretaceous
Kdw – Dawson Formation	Late Cretaceous

The **Post-Piney Creek Alluvium** and **Piney Creek Alluvium** can produce prehistoric bone, shell, and/or plant material, but because the sediments are less than 10,000 radiocarbon years old, any material found could be in an archaeological context and should be evaluated first by a qualified archaeologist.

The **unnamed eolian sand** unit has produced camel, pronghorn antelope, black-tailed prairie dog, Richardson's ground squirrel, and extinct peccary remains in Denver and Aurora (Hunt 1954; Lewis 1970).

The **unnamed loess** unit has produced horse and camel specimens from south of Littleton (Scott 1963).

Mammoth, camel, horse, bison, prairie dog, Richardson's ground squirrel, pocket gopher, field mouse, and rabbit specimens have been collected from the **Slocum Alluvium** south of Littleton and east of Byers (Scott 1963; unpublished U. S. Geological Survey and University of Colorado Museum fossil locality data). Lewis (1970) described a horncore of the extinct bison, *Bison latifrons*, from the Slocum Alluvium near Canon City.

Vertebrate fossils, including *Equus* sp. (horse) and camel are known from the **Verdos Alluvium** in northeastern Colorado (Scott 1978; unpublished U. S. Geological Survey fossil locality data). The Verdosa Alluvium has produced terrestrial snail fossils north of Golden (Van Horn 1976:62).

The **Denver and Dawson Formations** have produced Late Cretaceous leaves, dinosaur remains, and very rarely, mammal teeth, as well as early Paleocene leaves and mammal, reptile, and amphibian bones and teeth in the Denver Basin (Cannon 1906; Brown 1962; Middleton 1983; Carpenter and Young 2002; Johnson et al. 2003; Hutchison and Holroyd 2003; Eberle 2003; Middleton and Dewar 2004; Wilf et al. 2006; Reynolds et al. 2007). I am aware of only two published invertebrate fossil occurrences in the Denver Formation (Cross 1889:131; Cannon 1893:261; Brown 1943:79), but a third one has been recorded recently adjacent to State Highway 86 east of Kiowa, at University of Colorado Museum (UCM) fossil locality 91278. The Denver and Dawson Formations are paleontologically sensitive geologic units whose regular production of scientifically important leaf fossils and more sporadic production of scientifically important vertebrate fossils have resulted in the establishment of a general policy of construction monitoring wherever significant construction impacts to the unit are proposed.

CORRIDOR FOSSIL LOCALITIES

I know of no published or unpublished fossil localities within the study area limits in any of the mapped geologic units (Soister 1965; Trimble and Machette 1969).

CONCLUSIONS

The Denver and Dawson Formations present within the project study area are highly paleontologically sensitive, so any sub-surface excavation and construction that encounters these formations is likely to impact potentially scientifically important fossils. Surface activity and construction is less likely to impact these formations or any fossils they may contain. Determining the extent of potential impacts to the Denver and Dawson formations may be difficult prior to either drilling of geophysical study cores in the project study area or the beginning of project excavations, due to the variable depth of these formations below the much less sensitive Holocene and Pleistocene units above them; however, once the locations of Denver

and Dawson impact sites within the project area have been determined, monitoring of those locations by a qualified paleontologist is recommended. The Pleistocene units mapped within the study area have a much lower probability of having scientifically important fossils uncovered, damaged, and/or destroyed by future construction within the study area; however, spot-check monitoring at the discretion of the project or staff paleontologist would be warranted to ensure that disturbance of Denver and Dawson formation is not inadvertently overlooked during excavations of Pleistocene sediments.

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Section 4(f) Coordination



City of Brighton
500 South 4th Avenue
Brighton, CO 80601
303-655-2000 Office
www.brightonco.gov

September 29, 2014

Troy Halouska
Section 4(f) Specialist
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue, Shumate Building
Denver, CO 80222

Subject: I-76 and Bridge Street Interchange Project, City of Brighton, Colorado

Dear Mr. Halouska:

The Colorado Department of Transportation (CDOT) and the City of Brighton are proposing to construct a new interchange at I-76 and Bridge Street in the City of Brighton, Colorado. Currently there is no direct connection between the two transportation facilities; Bridge Street crosses over I-76. There will be approximately 0.2 acres of permanent right-of-way acquisition and 0.1 acres of temporary easements required to implement the project. The goal of the project is to improve local and regional connectivity, address existing and future congestion, and improve traffic flow. It is anticipated that the proposed construction activities will start mid-2016; construction is anticipated to extend through 2019.

Section 4(f) of the Department of Transportation Act protects significant publicly-owned parks, recreation areas, and wildlife and waterfowl refuges, as well as significant historic sites, whether they are publicly or privately owned. There are two proposed trails in the approved 2004 *City of Brighton Greenways and Trails Master Plan* that are within the construction envelope for the proposed interchange; these are considered significant public recreation resources. The City of Brighton Parks and Recreation Department and CDOT have been coordinating with each other regarding the proposed action and any potential impacts to recreational resources. As shown in the attached Figure 1, the future I-76 Trail follows I-76 along its length from Baseline Road to 112th Street using the highway right of way except for a section shared with the proposed Prairie Center Parkway on-street trail. The future Bridge Street Trail extends from Yosemite Street in the west to I-76 along the roadway in the Master Plan, but the City plans to extend it over I-76 on Bridge Street at which time bike and pedestrian provisions will be addressed. Neither trail is currently funded nor does either have a construction date assigned. The proposed interchange project will not preclude nor impact the proposed future trails, and therefore it is believed that no formal Section 4(f) clearance is required.

Please accept this letter as the acknowledgement that this issue has been discussed and addressed.

Sincerely,

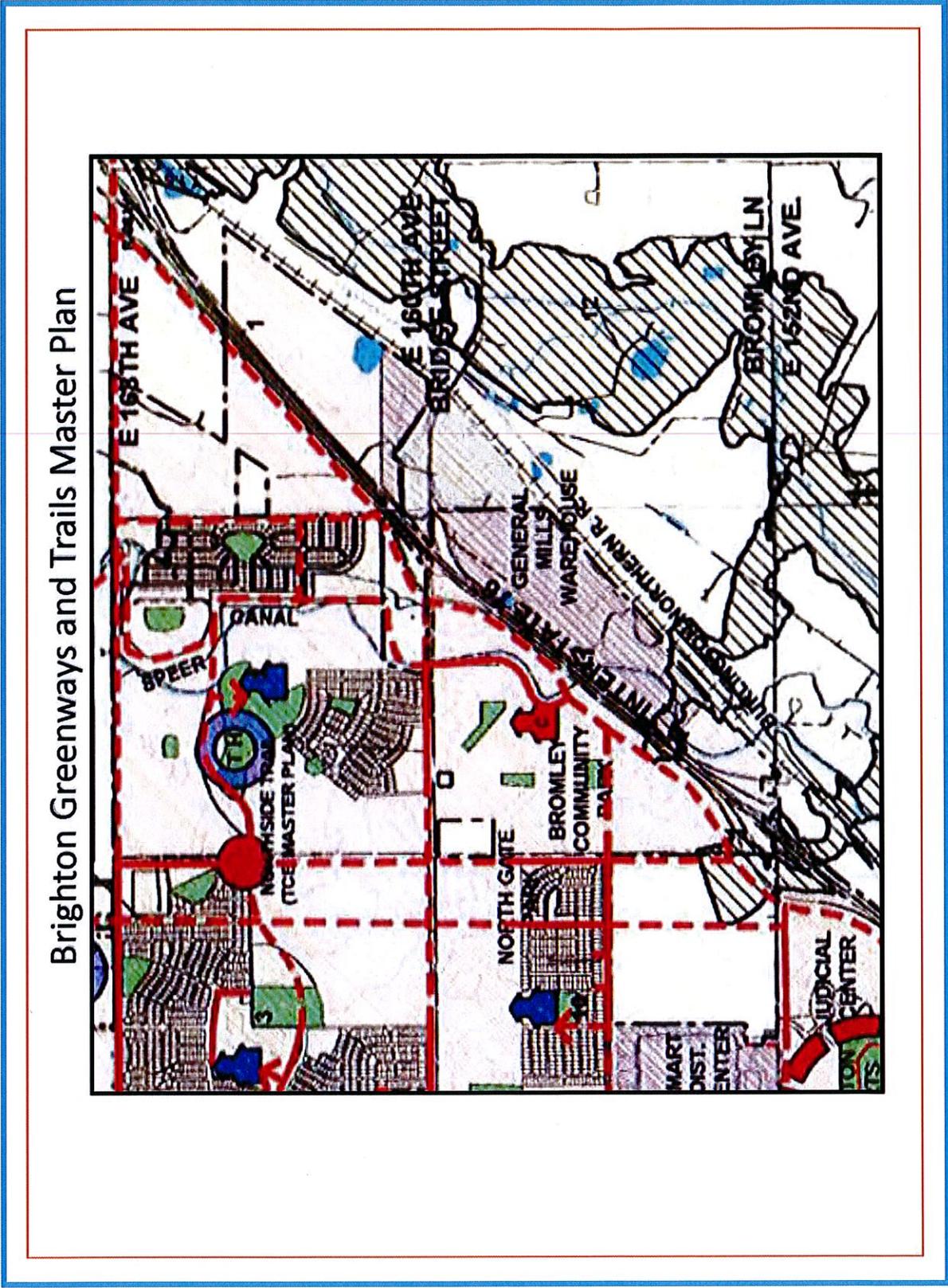
Mark Heidt
Assistant Parks and Recreation Director
City of Brighton

Attachments:

Figure 1: Brighton Greenway and Trails Master Plan Screen Shot of Project Vicinity

cc: File

Figure 1: Brighton Greenway and Trails Master Plan Screen Shot of Project Vicinity



United States Fish and Wildlife Service Concurrence of No Effect



United States Department of the Interior



FISH AND WILDLIFE SERVICE
COLORADO FIELD OFFICE/LAKEWOOD
P.O. BOX 25486, DENVER FEDERAL CENTER
DENVER, COLORADO 80225-0486

IN REPLY REFER TO:
ES/CO: CDOT
TAILS: 06E24000-2015-I-0137

DEC - 9 2014

Jillian K. Mauer
Pinyon Environmental, Inc.
9100 West Jewell Avenue, Suite 200
Lakewood, Colorado 80232

Dear Ms. Mauer:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Service reviewed your November 26, 2014, report regarding reconstruction of the I-76 and Bridge Street Interchange in Brighton, Adams County, Colorado, and its potential effects on federally protected species.

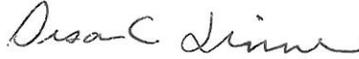
Historic land use in the project vicinity is agricultural, and areas in the immediate vicinity of the I-76 and Bridge Street intersection remain largely undeveloped. Residential and commercial development however, is planned on both the east and west sides of the interstate. The proposed project will be generally located within the existing roadway right-of-way in areas where the natural vegetation, soils, and hydrology have been altered by filling, grading, and road construction, maintenance, and operation activities. Habitat types within the area include upland native or planted grasses intermixed with weedy roadside habitat, two wetlands, and landscaped areas. No riparian habitats or adjacent wetlands occur in the project area.

Given your assessment of the habitat in the project area, the Service finds the report acceptable and agrees that habitat for any species federally listed as threatened or endangered is not present within the surveyed area. In addition, any impacts to species downstream in the Platte River system that may be affected by water depletions caused by the project are addressed by the Federal Highway Administration's programmatic consultation (06E24000-2012-F-0328; ES/LK-6-CO-12-F-020). Thus, the Service concurs with the determination that the impacts resulting from the proposed project will not impact any of these species.

Please note that should project plans change or if additional information regarding listed or proposed species becomes available, this determination may be reconsidered under the ESA. If the proposed project has not commenced within one year, please contact the Colorado Field Office to request an extension.

We appreciate your submitting this report to our office for review and comment. If the Service can be of further assistance, please contact Alison Deans Michael of my staff at (303) 236-4758.

Sincerely,



Susan C. Linner
Colorado Field Supervisor

ec: Michael

Ref: Alison\H:\My Documents\CDOT 2007+\Region 1\I-76_&_Bridge_Street_interchange_agree.docx



Outreach and Support

Documentation

Appendix H Contents

- CDOT Letter to DRCOG—September 13, 2013
- I-76 and Bridge Street Interchange Project Charter Document—April 3, 2013

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 1 – Program Delivery
2000 South Holly Street
Denver, CO 80222
(303) 757-9388
(303) 757-9988 FAX



September 13, 2013

Denver Regional Council of Governments
1290 Broadway, Suite 700
Denver, CO 80203-5606

RE: 1601 Interchange Request, I-76 and Bridge Street

Dear Mr. Rigor,

As you may know, the City of Brighton has been working very closely with CDOT regarding the 1601 approval process for the I-76 and Bridge Street proposed interchange. In addition, the final system level feasibility report is being sent to your office by the close of business Wednesday, September 18, 2013.

The purpose of this study is to prove that the new proposed interchange will improve local and regional east-west connectivity, reduce the amount of congestion and delay in the study area on opening day which is planned for 2019 and through the planning horizon year of 2035, and improve traffic flow and access.

We do not anticipate any challenges or controversy and have received support from the public, the City of Brighton, Adams County, FHWA, and the CDOT Commissioner, Heather Barry. I fully support this project, its purpose and all parties are well briefed on the benefits this project brings to the transportation plan. Barring any unforeseen obstacles, we are looking forward to this amendment into the DRCOG 2035 plan.

This project will be presented to the CDOT Transportation Commission on Thursday, October 17, 2013, and I am recommending it for approval along with my constituents who are also in support of this project.

The City of Brighton has already committed to funding this project in 2019, and therefore no State funds are planned.

Sincerely,



Paul Jesaitis
CDOT Region 1 Deputy Director Program Delivery

cc: Steve Cook, DRCOG

Manual Esquibel, City of Brighton, City Manager

Joe Smith, City of Brighton, Director of Streets and Fleet

Heather Barry, CDOT Transportation Commissioner

Anthony R. DeVito, P.E, Region 1 Transportation Director

Neil Lacey, CDOT Region 1 Resident Engineer

Steve Hersey, CDOT Region 1 Traffic Engineer

Jeff Kullman/Ken DePinto, Atkins Global North America

I-76 & Bridge Street INTERCHANGE

Project Charter Document

April 3, 2013

Colorado Department of Transportation (CDOT)

Federal Highway Administration (FHWA)

City of Brighton

Atkins Consultant Team

1601 Process for I-76 & Bridge Street Interchange

Addressing difficult transportation issues is one of the most significant challenges facing federal, state, and local governments. Conflict about transportation planning and development raise a variety of issues about quality of life, economic development, land use, and environmental justice. Government leaders need tools and governing models, such as charters, that can assist in finding ways to successfully address many perspectives and solve transportation problems as one voice. The key Project Team members are:

Project Team

City of Brighton

Colorado Department of Transportation (CDOT)

Federal Highway Administration (FHWA)

Atkins Consultant Team

Charter Purpose

The Charter is a clear description of the team's purpose and identifies the authority and resources provided to accomplish that purpose. It clarifies expectations, keeping the team focused and aligned with project-related priorities. Participation from the various transportation agencies is critical to the successful implementation of this project. These agencies will work together to clearly identify the roles of each during the planning, design and approval of the Interstate 76 (I-76) and Bridge Street Interchange. The purpose of this charter document is to provide the structure for the partner agencies

to effectively and efficiently communicate during the planning and design of the I-76 and Bridge Street Interchange.

Project Background

Additional interstate access to I-76 and Bridge Street in Brighton is necessary to accommodate the traffic in this growing area of the Denver region. Presently, Bridge Street (East 160th Avenue) has a bridge over I-76. To the southwest is the Bromley Lane (East 152nd Street) Interchange and to the northeast is the Lochbuie Interchange (East Baseline Road). The Bromley interchange is experiencing increasing congestion, impacting the mobility of nearby residents and businesses. Brighton will continue to have substantial growth and potential for significant economic development and a new interchange at Bridge Street is an obvious location.

Project Goals and Objectives

The purpose of this project is to complete the 1601 process in an aggressive 18-month time frame. Major elements of the 1601 process include evaluating potential alternatives for a new interchange at I-76 and Bridge Street, selecting a Preferred Alternative, completing a System Level Study, and completing the National Environmental Policy Act (NEPA) process.

Goals:

- Complete an Environmental Assessment (EA) and decision document
- Approved System Level Study (SLS)
- CDOT & FHWA approval for the EA and Interstate Access Request (IAR)
- Complete 30% design plans by September 2014
- A project that the Project Team is happy with and proud of

Objectives:

- Communicate in a timely fashion
- Commit to meeting the Project Schedule
- Concurrence of key stakeholders
- Obtain approvals at major decision milestones
- Resolve issues in a timely and constructive manner

Roles and Responsibilities

- Project Manager – Joe Smith, City of Brighton – Responsible for overall project for the city and keeping city council apprised of status. Representative of project sponsor – City of Brighton
- Deputy Project Manager - Annette Marquez, City of Brighton – Responsible for day-to-day running of the project with the City and main point of contact for team.
- Environmental Manager – Jon Chesser, CDOT – Responsible for guiding EA document development and part of joint lead agencies (with FHWA)
- Project Authority – Monica Pavlik, FHWA – Central point of contact and responsible for NEPA process oversight and part of joint lead agencies (with CDOT). Final approval authority will reside with Shaun Cutting.

- Consultant Project Manager – Jeff Kullman/Ken DePinto, Atkins – Responsible for consultant team performance, contract deliverables, maintaining project schedule.
- Resident Engineer – Neil Lacey, CDOT – Responsible for Design elements in the project for CDOT and part of joint lead agencies (with FHWA).

Project team members and agency representatives will be responsible for communicating project related information and issues to internal staff members.

Document Involvement, Review and Comment Period

Involvement

Agencies are expected to participate at various milestones

Project Task	CDOT	FHWA	City of Brighton	Public (Hearings and other feedback)	Review Period
Purpose and Need Statement	R	A	C	C	One week
System Level Study (SLS)	R	A	C	I	Two weeks
Alternatives Evaluation Criteria	R	A	C	I	Two weeks
Alternatives Development/Conceptual Design	R	A	C	C	Two weeks
Evaluation of Alternatives	R	A	C	I	Two weeks
Selection of Preferred	R	A	C	I	One week
Review of Draft EA	R	A	C	C	Two weeks
Interstate Access Request (IAR)	R/A	A		C	-Local – 2weeks -30 days in Wash. D.C.
Decision Document Approval	R	A	C	I	Two weeks
Final IGA	R	I	R	I	One month

RACI Definitions:

Responsible – Agency or organization that works to achieve the task; may be multiple organizations responsible.

Accountable – Agency or organization ultimately accountable; there must only be one Accountable specified for each task.

Consulted – Stakeholders whose input is sought; may be multiple agencies or organizations consulted. Involves two-way communication.

Informed – Stakeholders who are kept up-to-date on the progress. Involved one-way communication from a Responsible stakeholder to the Informed stakeholder.

Operating Rules

The following operating rules will be followed by the Project Team Members at meetings where project issues are being discussed. Please note that Project Team Meetings (Agency Coordination) are being scheduled and email notification will be provided.

- Each team member is responsible to bring issues or resolutions fully defined, and with full support of the agency they represent.
- Agencies are required to speak to issues in one unified voice. It is not the responsibility of the project team to resolve internal disagreements.
- Each team member is responsible for providing their time to tasks assigned.
- No Back Sliding – Once a decision has been agreed to by the Project Team there will be no revisiting the issue unless extenuating circumstances are identified.
- Openly raise issues and concerns as they arise, rather than waiting for formal review and comment periods.
- Actively participate in constructive and collaborative discussions.
- Determine and agree upon the level of detail of information and analysis that is appropriate for each deliverable.
- Consider comments that are obtained from the public involvement process, resource agencies, and any other groups or committees (or individual members of these entities) formed during the project.

Schedule

The project schedule has been developed for the I-76 and Bridge Street Interchange project. The project schedule includes tasks, critical dates, meetings, milestones and deliverables which will be coordinated with the Project Team.

Once the Project Team has agreed upon the schedule, it is crucial the Project Team adheres to the deadlines established in the schedule to meet the goal of this project, completion of the 1601 process by September 2014. The project schedule will be maintained by the Consultant Project Manager and will be adopted by the Project Team as the official plan for the project. Progress will be reviewed monthly and the schedule will be updated as necessary. Changes to the project schedule will be communicated to the Project Team. Substantial changes will be approved by the Project Team before changes are accepted (see attached schedule).

Dispute Resolution

Every effort should always be made to resolve disputes at the Project Team level. This is the level where the project and the issues are well understood by the agency representatives who are familiar with the problem-solving environment and each other. However, disputes involving methodologies, decisions, schedules, reviews, etc. of the I-76 and Bridge Street Interchange project could be elevated to higher level authorities within the respective disputing agencies. The higher authorities could negotiate, with or without assistance. If the dispute remains unresolved, it could be elevated further to an ultimate authority as governed by applicable laws and regulations.

APPENDIX B.

MEMORANDUM: I-76 AND BRIDGE STREET SENSITIVITY
ANALYSIS AND COMPARISON OF 2035 VERSUS 2040 DRCOG
TRAFFIC VOLUMES

Memo

To: Paul Jesaitis, Region 1 Deputy Director CDOT, and Alicia Nolan, Assistant Division Administrator, FHWA

From: Ken DePinto  **Email:** Ken.DePinto@atkinsglobal.com

Phone: 720-475-7085 **Date:** 5 May 2015

Subject: I-76 and Bridge Street Sensitivity Analysis and Comparison of 2035 versus 2040 DRCOG Traffic Volumes

1. Background

As you may know, the I-76 and Bridge Street Environmental Assessment (EA) has been completed and was signed by the Colorado Department of Transportation (CDOT) and the Federal Highway Administration (FHWA) on January 23, 2015. The document was released for a 30-day public comment period on February 12, 2015, as required. The 30-day comment period ended on March 14, 2015, at which time no controversial comments had been received. In addition, the Interstate Access Review (IAR) has been accepted by CDOT and FHWA and it is ready for approval following the concurrence of this memo and the results presented below.

During the 30-day review period from February 2015 to March 2015, the Denver Regional Council of Governments (DRCOG) approved new 2040 traffic volume numbers. The purpose of this memo is to compare these newly released 2040 traffic volume numbers to the DRCOG 2035 traffic volume numbers that were used in the EA analysis. This analysis to determine if the new numbers have any impacts on the completed EA must be performed since the decision document has not been signed yet. If there are no impacts as determined by CDOT and FHWA, the City of Brighton will be allowed to finalize this project using the 2035 numbers from DRCOG, as proposed, and finalize this project using the CDOT FONSI template.

The following analysis compares the 2035 numbers to the 2040 numbers with regard to:

- Level of Service (LOS)
- Noise
- Air Quality

Since this project is in the 2035 Regional Transportation Plan (RTP), the 2040 numbers are comparative.

2. Level of Service Comparison between 2035 and 2040 DRCOG Numbers

Table 1, below, shows the 2035 numbers used for the Preferred Alternative at I-76 and Bridge Street, the 2040 numbers from DRCOG, the percent difference between the two, and the 2035 and 2040 LOS ratings for AM and PM peaks and daily traffic. Since these percentages appear to be high between 2035 and 2040 in some cases, it was not reasonable to use this comparison alone; therefore, the LOS was calculated. For example, in some cases the percentage may have changed by 63 percent, but this represents a change in volume, for example, of 100 vehicles per hour (VPH) in 2035 to 163 VPH in 2040.

*I-76 and Bridge Street Sensitivity Analysis
Comparison of 2035 and 2040 Traffic Volumes*

A change of only 63 vehicles has no impacts since the volumes are so low. Therefore, the columns comparing LOS are more useful. It can be seen that there are no noteworthy changes in LOS between 2035 and 2040 in both the AM and PM peak hour, and, therefore, there are no impacts to traffic.

Table 1. Comparison of 2035 Numbers to 2040 Numbers with Regard to Level of Service

Link			Direction	2035			2040			Difference			LOS AM		LOS PM	
Road	From	To		AM	PM	Daily	AM	PM	Daily	AM	PM	Daily	2035	2040	2035	2040
I-76	Baseline	North of Baseline	NB	920	1490	15450	799	1448	14315	13%	3%	7%	A	A	B	B
			SB	1580	1110	15600	1203	932	14343	24%	16%	8%	B	A	A	A
I-76	Baseline	Bridge	NB	925	1915	17850	1207	2598	23362	-30%	-36%	-31%	A	A	B	C
			SB	1970	1160	18100	2370	1496	24892	-20%	-29%	-38%	B	C	A	B
I-76	Bridge	Bromley	NB	1320	2340	21150	1340	2996	25930	-2%	-28%	-23%	A	A	B/C	C
			SB	2375	1510	21400	2713	1611	26850	-14%	-7%	-25%	B/C	C	A/B	B
I-76	Bromley	South of Bromley	NB	1550	2760	24050	1179	2880	24128	24%	-4%	0%	A/B	A	B/C	C
			SB	3055	1835	25300	2649	1530	26192	14%	17%	-4%	C/D	C	B	B
Baseline	West Frontage	to the west	EB	400	360	5270	989	522	9149	-147%	-45%	-74%	A	A	B	C
			WB	525	560	4930	453	966	8573	14%	-73%	-74%	A	B	A	A
Baseline	East Frontage	to the east	EB	100	380	3400	163	354	3244	-63%	7%	5%	A	A	A	A
			WB	350	225	2000	342	50	3071	2%	78%	-54%	A	A	A	A
Bridge	West Frontage	to the west	EB	420	460	5280	240	385	3340	43%	16%	37%	A	A	A	A
			WB	420	550	5320	346	277	3482	18%	50%	35%	A	A	A	A
Bridge	East Frontage	to the east	EB	60	160	1500	308	532	4918	-413%	-233%	-228%	A	C	A	B
			WB	160	95	1500	489	355	4875	-206%	-274%	-225%	A	B	A	A
Bromley	West Frontage	to the west	EB	520	1000	9850	576	1031	8929	-11%	-3%	9%	E	F	F	F
			WB	710	720	8850	869	617	7741	-22%	14%	13%	B	C	D	C
Bromley	East Frontage	to the east	EB	280	630	5600	464	481	5091	-66%	24%	9%	A	A	A	A
			WB	580	410	5600	487	467	5105	16%	-14%	9%	A	A	A	A

Positive difference means the 2035 volume is higher than the 2040 volume

Negative difference means the 2040 volume is higher than the 2035 volume

3. Noise Comparison between 2035 and 2040 DRCOG Numbers

Table 2, below, depicts the noise level numbers for the 2035 alternatives, and the last row depicts the 2040 numbers in the Preferred Alternative. It can be seen that there are no changes between the 2035 and 2040 Preferred Alternatives (Rows 3 and 6). There are no impacts regarding noise when comparing the 2035 and 2040 numbers.

Table 2. Comparison of 2035 Numbers to 2040 Numbers with Regard to Noise

Alternative	Predicted Noise		Total number of Dwelling Units	Number of Dwelling Units that Exceed NAC Threshold	Number of Dwelling Units with a Substantial Noise Increase
	Range Leq(h) (dBA)				
	Min	Max			
Existing	45	62	182	0	N/A
2035 No-Action Alternative	47	64	182	0	0
2035 Preferred Alternative	49	65	182	0	0
2035 Action Alternative 2	49	65	182	0	0
2035 Action Alternative 3	49	65	182	0	0
2040 Action Preferred Alternative	49	65	182	0	0

4. Air Quality Comparison between 2035 and 2040 DRCOG Numbers

In general, air quality impacts are a result of a change in traffic volume, a change in traffic delay, or a difference in vehicle mix, specifically due to changes in heavy truck percentages. As reported in the EA, under 2035 traffic conditions, there will not be an impact to air quality from the implementation of any of the Action Alternatives, nor from the No-Action Alternative. Furthermore, truck percentages are expected to remain consistent within the study area. Although there are some increases in traffic volume, these are not anticipated to impact air quality because, as stated in the EA, truck percentages along the frontage roads are expected to decrease as a more direct regional connection is available. Because there are no significant increases in traffic volume or differences in LOS between 2035 and 2040, there are no impacts to air quality from the Preferred Alternative in 2040.

5. Conclusion

The sensitivity analysis comparing LOS, noise, and air quality has shown that there are no impacts when comparing the 2035 DRCOG numbers to the new 2040 DRCOG numbers recently released. In addition, the preferred alternative will still operate at an acceptable LOS in both 2035 and 2040 with the proposed design and the preferred alternative will operate much better than the No Action alternative. We are asking for your concurrence with this analysis to move forward with completing the NEPA process and Interstate Access Request.

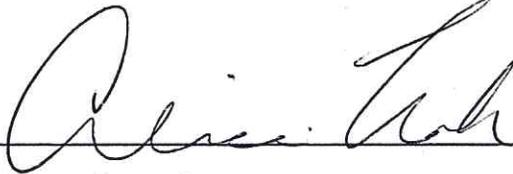
6. Concurrence



5-7-2015

I Concur: Paul Jesaitis
CDOT Region 1 Deputy Director

Date



5-20-2015

I Concur: Alicia Nolan
FHWA Assistant Division Administrator

Date



The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every sale, purchase, and payment must be properly documented to ensure the integrity of the financial statements. This includes recording the date, amount, and purpose of each transaction, as well as the names of the parties involved.

Secondly, the document highlights the need for regular reconciliation of bank accounts and credit cards. By comparing the company's records with the bank statements, any discrepancies can be identified and corrected promptly. This helps to prevent errors and ensures that the financial data is up-to-date and accurate.

Another key aspect is the proper classification of expenses. It is crucial to categorize each expense correctly according to the company's chart of accounts. This allows for a clear and detailed analysis of the company's spending patterns and helps in identifying areas where costs can be reduced.

Finally, the document stresses the importance of timely reporting. Financial statements should be prepared and reviewed regularly to provide management with the information they need to make informed decisions. This includes monthly profit and loss statements, balance sheets, and cash flow statements.