

HIGH PLAINS HIGHWAY



CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

PREPARED FOR CDOT REGIONS 1 & 4
JULY 2007



WILSON
& COMPANY
ENGINEERS & ARCHITECTS

IN ASSOCIATION WITH:

apexdesign

ARLAND
Land Use Economics

Pinyon
Environmental Engineering Resources

Hartwig & Associates, Inc.
Transportation Design Consultants

Reay Engineering

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Acknowledgements

The writers of this Corridor Development and Management Plan wish to acknowledge and thank the members of the High Plains Highway Corridor Steering Committee and the High Plains Highway Corridor Technical Committee who served to guide its development:

Steering Committee Members:

City of Burlington
Town of Cheyenne Wells
City of Holyoke
Town of Julesburg
City of Wray
Cheyenne County
Kit Carson County
Phillips County
Sedgwick County
Yuma County

Councilmember Orlie Crist
Town Trustee Rayetta Palmer
Councilmember Bill Triplette
Mayor Clark D. Bernhardt
Mayor Pro-Tem Tim Entzel
County Commissioner Ron Howard
County Commissioner Jim Whitmore
County Commissioner Bud Bieseemeier
County Commissioner Chuck Powell
County Commissioner Dean Wingfield

Technical Committee Members:

City of Burlington
Town of Cheyenne Wells
City of Holyoke
Town of Julesburg
City of Wray
Cheyenne County
Kit Carson County
Phillips County
Sedgwick County
Yuma County

City Administrator Bob Churchwell
Town Superintendent Dannie McMillan
Town Superintendent Mark Brown
Town Trustee Rex Nicolaus
City Manager Stan Holmes
County Commissioner Ron Howard
City Administrator Bob Churchwell
County Administrator Randy Schafer
County Commissioner Chuck Powell
County Commissioner Robin Wiley



HIGH PLAINS HIGHWAY
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

RESOLUTIONS OF ENDORSEMENT



RESOLUTION 2007-02

STATE OF COLORADO) RESOLUTION OF THE CITY COUNCIL
)ss. OF THE CITY OF BURLINGTON IN
County of Kit Carson) THE COUNTY OF KIT CARSON,
 STATE OF COLORADO

A RESOLUTION SUPPORTING THE HIGH PLAINS HIGHWAY 385
COALITION PLAN

WHEREAS, there has been submitted to the City Council of the City of Burlington a copy of the proposed High Plains Highway 385 Coalition Plan; and

WHEREAS, the contents of the Plan have been found to be consistent with the goals of the City of Burlington;

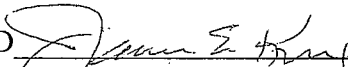
NOW THEREFORE, IT IS RESOLVED by the City Council of the City of Burlington, that

SECTION 1. The City Council does hereby support the High Plains Highway 385 Coalition Plan.

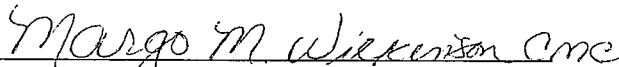
ADOPTED at Burlington, Colorado, this 29th day of May, 2007.

CITY COUNCIL OF BURLINGTON

SIGNED


James E. Knox, Mayor

ATTEST


Margo M. Wilkinson, CMC, Clerk and Treasurer

STATE OF COLORADO)
)ss.
County of Kit Carson)

CLERK'S CERTIFICATE

That I, Margo M. Wilkinson, the official City Clerk of the City of Burlington, do by these presents say that the foregoing Resolution was authorized and adopted by the City Council of the City of Burlington on the 29th day of May, 2007.

DATED this 29th day of May, 2007.

Margo M. Wilkinson CMC
Margo M. Wilkinson, CMC, City Clerk and Treasurer

[SEAL]

STATE OF COLORADO)
)ss.
County of Kit Carson)

I, Margo M. Wilkinson, a Notary public in and for the County of Kit Carson in the State of Colorado, do hereby certify that James E. Knox, Mayor of the City of Burlington in the County of Kit Carson in the State of Colorado, who is personally known to me to be the person whose name is subscribed to the foregoing Resolution, appearing before me this day in person, acknowledged that he signed, executed, sealed and delivered the said instrument in writing as his free and voluntary act and deed as such Mayor and as the free and voluntary act of the City of Burlington in the County of Kit Carson in the State of Colorado, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 30th Day of May, 2007.

[SEAL] **MARGO M. WILKINSON**
NOTARY PUBLIC
STATE OF COLORADO *Margo M. Wilkinson CMC*
Notary Public
My Commission Expires 1-23-2010

My Commission Expires: 1-23-2010

RESOLUTION #4-07

A RESOLUTION IN SUPPORT OF THE RECOMMENDATIONS CONTAINED WITHIN THE HIGH PLAINS HIGHWAY 385/40 CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN.

WHEREAS, there has been submitted to the Board of Trustees of the Town of Cheyenne Wells a copy of the proposed High Plains Highway 385/40 Development and Management Plan;

WHEREAS, High Plains Highway 385/40 is the only North/South U.S. Highway in eastern Colorado;

WHEREAS, High Plains Highway 385/40 goes through the county seats of every county in eastern Colorado and is critical to the economics of the region, especially the agriculture, renewable energy, and tourism industries;

WHEREAS, the Town of Cheyenne Wells is very concerned with safety issues all along the corridor, especially the lack of shoulders on the highway and the numerous 90° turns that vehicles are required to negotiate;

WHEREAS, all materials submitted as part of the Plan have been reviewed by designated Town Staff and the Board of Trustees of the Town of Cheyenne Wells; and

WHEREAS, the contents of the Plan have been found to be consistent with the goals of the Town of Cheyenne Wells.

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the Town of Cheyenne Wells, Colorado, that


Section 1. The Board of Trustees does hereby support the High Plains Highway 385/40 Corridor Development and Management Plan and supports the projects that have been identified as critical to the economics and safety of the region. -

INTRODUCED, READ, AND ADOPTED this 12th day of June, 2007.



Monte Baker

Mayor



Deborah G. Knudsen, CMC Town Clerk

**RESOLUTION # 2007-004
CHEYENNE COUNTY, COLORADO**

**RESOLUTION TO ENDORSE THE HIGH PLAINS HIGHWAY CORRIDOR
DEVELOPMENT AND MANAGEMENT PLAN**

WHEREAS, the High Plains Highway begins at the Town of Kit Carson, runs along U.S. Highway 40 to the Town of Cheyenne Wells, and then along U.S. Highway 385 north to the Nebraska State line;

WHEREAS, the High Plains Highway is a major north/south corridor extending in Eastern Colorado through Cheyenne, Kit Carson, Yuma, Phillips and Sedgwick Counties;

WHEREAS, the High Plains Highway was named as the Colorado Connecting Corridor between Heartland Express and the Ports-To-Plains Highway in the Eastern Colorado Mobility Study;

WHEREAS, the Colorado Department of Transportation has undertaken a Corridor Development and Management Plan to identify improvements and programs that could improve the operation and safety of this route;

WHEREAS, safety improvements, including the addition of shoulders, will greatly enhance the usability of the corridor;

WHEREAS, Cheyenne County actively participated in this study;

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Cheyenne County, State of Colorado, hereby endorses the High Plains Highway Corridor Development and Management Plan and recommends that the projects identified be moved forward to the 2035 Plan of the Eastern Colorado Transportation Planning Region.

BOARD OF COUNTY COMMISSIONERS, CHEYENNE COUNTY

Richard Bergman
Richard Bergman, Chairman

Nancy Bogenhagen
Nancy Bogenhagen, Commissioner

Ronald N. Howard
Ronald N. Howard, Vice Chairman

STATE OF COLORADO)
COUNTY OF CHEYENNE) SS

The forgoing instrument was acknowledged before me this 19th day of July, 2007 by Commissioners Richard Bergman, Nancy Bogenhagen and Ronald N. Howard in Cheyenne County, Colorado.

Witness my hand and official seal.

Jessica S. Unruh
Jessica Unruh, Deputy Clerk to the Board

RESOLUTION NO. 2-2007

A RESOLUTION TO ENDORSE THE HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN.

The High Plains Highway begins at the Town of Kit Carson, runs along U.S. 40 to the Town of Cheyenne Wells; then along U.S. 385 north to the Nebraska State line.

WHEREAS, the High Plains Highway is a major north/south corridor extending in eastern Colorado through Cheyenne, Kit Carson, Yuma, Phillips, and Sedgwick Counties;

WHEREAS, the High Plains Highway was named as the Colorado Connecting Corridor between Heartland Express and the Ports to Plains Highway in the Eastern Colorado Mobility Study;

WHEREAS, the Colorado Department of Transportation has undertaken a Corridor Development and Management Plan to identify improvements and programs that could improve the operation and safety of this route;

WHEREAS, safety improvements, including the addition of shoulders, will greatly enhance the usability of the corridor;

NOW, THEREFORE, BE IT RESOLVED, that the Council of the City of Holyoke, Colorado hereby endorses High Plains Highway Corridor Development and Management Plan and recommends that the projects identified be moved forward on the 2035 Plan of the Eastern Colorado Transportation Planning Region.

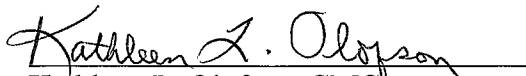
READ, PASSED AND ADOPTED this 26th day of June, 2007

CITY OF HOLYOKE



David P. Nygaard, Mayor Pro Tem

ATTEST:



Kathleen L. Olofson, CMC
City Clerk/Treasurer

**TOWN OF JULESBURG
RESOLUTION 2007-02**

WHEREAS, US #40 at Kit Carson, CO, extends north-east through Cheyenne Wells, CO, where US #40 intersects with US #385, extends north where it intersects with State Hwy. #138, extends west through the Town of Julesburg, CO and then US #385 extends northbound into Deuel County, NE near Chappell, NE.

WHEREAS, the Colorado Department of Transportation (CDOT) has undertaken a Corridor Development and Management Plan to identify improvements and programs that could improve the operation and safety on US #385 and #40;


NOW, THEREFORE BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF JULESBURG, COLORADO, AS FOLLOWS:

Section I. Approval. The Town Board of the Town of Julesburg, CO supports the findings and recommendations of the High Plains Highway Corridor Development and Management Plan and recommend that it be adopted by the Transportation Commission of the Colorado Department of Transportation.

PASSED, APPROVED AND ADOPTED this 4th day of June, 2007 by the Town Board of the Town of Julesburg, CO on the first and final reading by a vote of 6 for, 0 against and 1 absent.

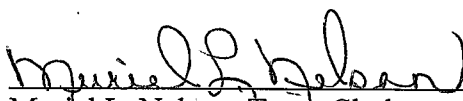
TOWN OF JULESBURG

(SEAL)



Clark D. Bernhardt, Mayor

ATTEST



Muriel L. Nelson, Town Clerk

STATE OF COLORADO }
 } ss
COUNTY OF KIT CARSON }

At a regular meeting of the Board of County Commissioners for Kit Carson County, State of Colorado, held at the Courthouse in Burlington on Wednesday, the 23rd day of May A.D. 2007, there were present:

John Nichols	Commissioners Chairman
Jim Whitmore	Commissioner
Dave Gwyn	Commissioner
Wade Gateley	County Attorney
Della M. Calhoon	County Clerk

When the following proceedings, among others, were had and done, to wit:

RESOLUTION # 16494
A RESOLUTION IN SUPPORT OF THE RECOMMENDATIONS
CONTAINED WITHIN THE US HWY 385 CORRIDOR
OPTIMIZATION STUDY

WHEREAS, United States Highway 385 is a major north/south regional highway through Kit Carson County extending south to Cheyenne County and North to Yuma County; and

WHEREAS, the Colorado Department of Transportation has undertaken a Corridor Optimization Study on US Hwy 385 to identify improvements and programs that could improve the operation and safety; and

WHEREAS, Kit Carson County would actively participate in this study.

BE IT THEREFORE RESOLVED, the Kit Carson County Commissioners do hereby express adoption/endorsement of the US Highway 385 Corridor Optimization Study contingent upon the adoption of the plan by the Transportation Commission of the Colorado Department of Transportation. The High Plains Highway is a 222-mile corridor that begins near Kit Carson and ends at I-80 in Nebraska.

DONE THIS 23rd day of May, 2007 at Burlington, Colorado.

Motion made by John Nichols, seconded by Dave Gwyn,

motion carried by unanimous vote of Jim Whitmore.

Kit Carson County
Board of County Commissioners

By: John Nichols
John Nichols, Chairman

By: Jim Whitmore
Jim Whitmore, Commissioner

By: Dave Gwyn
Dave Gwyn, Commissioner

ATTEST:

Della M. Calhoon
Della M. Calhoon, County Clerk



RESOLUTION 01-062007

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT
AND MANAGEMENT PLAN

The High Plains Highway begins at the Town of Kit Carson, runs along U.S. 40 to the Town of Cheyenne Wells; then along U.S. 385 north to the Nebraska State line.

WHEREAS, the High Plains Highway is a major north/south corridor extending in eastern Colorado through Cheyenne, Kit Carson, Yuma, Phillips, and Sedgwick Counties;

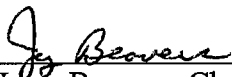
WHEREAS, the High Plains Highway was named as the Colorado Connecting Corridor between Heartland Express and the Ports to Plains Highway in the Eastern Colorado Mobility Study;

WHEREAS, the Colorado Department of Transportation has undertaken a Corridor Development and Management Plan to identify improvements and programs that could improve the operation and safety of this route;


WHEREAS, safety improvements, including the addition of shoulders, will greatly enhance the usability of the corridor;

WHEREAS, Phillips County actively participated in this study;


BE IT THEREFORE RESOLVED, that the Board of Phillips County Commissioners hereby endorses High Plains Highway Corridor Development and Management Plan and recommends that the projects identified be moved forward on the 2035 Plan of the Eastern Colorado Transportation Planning Region.



Jerry Beavers, Chairman

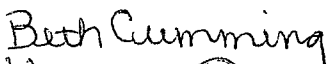
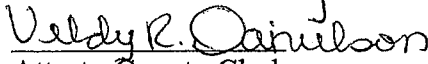


Susan Roll



Quentin Biesemeier

6/7/07
DATE



Attest: County Clerk

COPY

SEDGWICK COUNTY
RESOLUTION 2007-06

WHEREAS, US #40 at Kit Carson, CO extends north-east through Cheyenne Wells, CO, where US #40 intersects with US #385, extends north where it intersects with State Hwy #138, extends west through the Town of Julesburg, CO and then US Hwy #138, extends northbound into Deuel County, NE near Chappell, NE

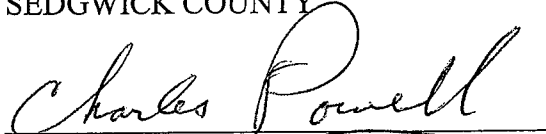
WHEREAS, the Colorado Department of Transportation (CDOT) has undertaken a Corridor Development and Management Plan to identify improvements and programs that could improve the operation and safety on US #385 and #40;

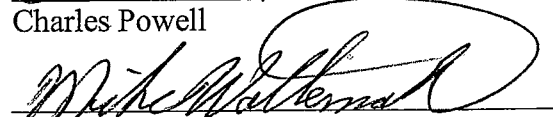
NOW, THEREFORE BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF SEDGWICK COUNTY, COLORADO, AS FOLLOWS:

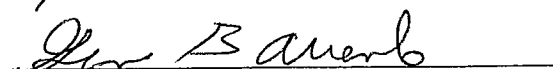
Section I. Approval. The Sedgwick County Board of Commissioners supports the findings and recommendations of the High Plains Highway Corridor Development and Management Plan and recommend that it be adopted by the Transportation Commission of the Colorado Department of Transportation.

PASSED, APPROVED AND ADOPTED this 6th day of June, 2007 by the Board of Commissioners of Sedgwick County, CO on the first and final reading by a vote of ___ for, ___ against and ___ absent.

BOARD OF COMMISSIONERS
SEDGWICK COUNTY

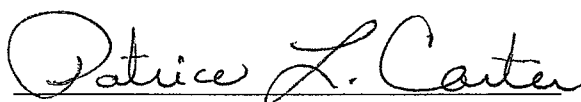

Charles Powell


Mike Woltemath


Gene Bauerle



ATTEST


Patrice L Carter, Clerk to the Board
Sedgwick County Clerk and Recorder

RESOLUTION

13-2007

**HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT
AND MANAGEMENT PLAN**

The High Plains Highway begins at the Town of Kit Carson, runs along U.S. 40 to the Town of Cheyenne Wells; then along U.S. 385 north to the Nebraska State line.

WHEREAS, the High Plains Highway is a major north/south corridor extending in eastern Colorado through Cheyenne, Kit Carson, Yuma , Phillips, and Sedgwick Counties;

WHEREAS, the High Plains Highway was named as the Colorado Connecting Corridor between Heartland Express and the Ports to Plains Highway in the Eastern Colorado Mobility Study;

WHEREAS, the Colorado Department of Transportation has undertaken a Corridor Development and Management Plan to identify improvements and programs that could improve the operation and safety of this route;

WHEREAS, safety improvements, including the addition of shoulders, will greatly enhance the usability of the corridor;

WHEREAS, Sedgwick County, Julesburg, Phillips County, Holyoke, Yuma County, Yuma, Kit Carson County, Burlington, Cheyenne County, Cheyenne Wells, Kit Carson, and the city of Wray actively participated in this study;

BE IT THEREFORE RESOLVED, that the City Council of Wray, Colorado hereby endorses High Plains Highway Corridor Development and Management Plan. The City of Wray hereby pledges that it will be taking an active role to see that the projects identified be moved forward on the future plan of the Eastern Colorado Transportation Planning Region.

PASSED AND APPROVED August 14, 2007

Mayor, Wray City Council

Date

**RESOLUTION OF
THE YUMA COUNTY BOARD OF COMMISSIONERS**

Resolution # 06-15-07

RE: Support For High Plains Highway Corridor Development Plan

WHEREAS, The Board of County Commissioners of Yuma County, State of Colorado, has convened a duly and lawfully called regular meeting on the 16th day of July, 2007; and

WHEREAS, The Colorado Department of Transportation has undertaken the High Plains Highway Corridor Development Plan; and

WHEREAS, The Highway Plains Highway Corridor Development Plan contains Region 4, which includes the highways within Yuma County, specifically Hwy 385 from Kit Carson County to Phillips County; and

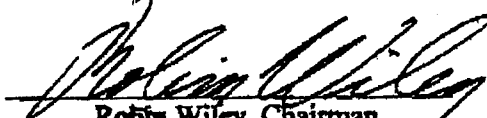
WHEREAS, Yuma County actively participated in this study.

BE IT THEREFORE RESOLVED, the Board of Yuma County Commissioners do hereby support the findings and recommendations of the High Plains Highway Corridor Development Plan and recommend that it be adopted by the Transportation Commission of the Colorado Department of Transportation.

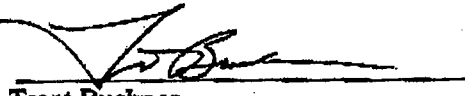
The above and foregoing Resolution was, on motion duly made and seconded, adopted by unanimous vote of the Yuma County Board of Commissioners on the 16th day of July 2007.

ADOPTED THIS 16th DAY OF JULY, 2007.

**THE BOARD OF COUNTY COMMISSIONERS
OF YUMA COUNTY, STATE OF COLORADO**


Robin Wiley, Chairman


Dean Wingfield


Trent Bushner

ATTEST: 
Beverly A Wenger, County Clerk

**HIGH PLAINS HIGHWAY
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN**

TABLE OF CONTENTS

EXECUTIVE SUMMARY

SECTION 1 – INTRODUCTION

SECTION 2 – CORRIDOR ASSESSMENT

SECTION 3 – CORRIDOR VALUE AND BENEFITS

SECTION 4 – PRIORITIZED PROJECTS

SECTION 5 – IMPLEMENTATION – PARTNERSHIP & FUNDING CONSIDERATIONS

SECTION 6 – SIGNING IMPROVEMENTS & INTELLIGENT TRANSPORTATION SYSTEMS

APPENDIX A - CONSTRUCTION COST ESTIMATES

APPENDIX B - ENVIRONMENTAL OVERVIEW

APPENDIX C – ELECTRICAL SERVICE & COMMUNICATION NEEDS FOR ITS DEVICES



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

LIST OF FIGURES

<u>FIGURE #</u>	<u>FIGURE DESCRIPTION</u>	<u>PAGE #</u>
FIGURE 1.1	HIGH PLAINS HIGHWAY CORRIDOR	1.2
FIGURE 2.1	SAFETY ANALYSIS	2.2
FIGURE 2.2	2006 TRAFFIC COUNT INFORMATION	2.3
FIGURE 2.3	PERMITTED LOAD INFORMATION	2.4
FIGURE 2.4	HIGHWAY SURFACE CONDITION	2.5
FIGURE 2.5	HIGHWAY RIGHT-OF-WAY	2.6
FIGURE 2.6	STRUCTURE LOCATIONS AND SUFFICIENCY RATINGS	2.7
FIGURE 2.7	ENVIRONMENTAL SENSITIVITY	2.8
FIGURE 3.1	US CORN PRODUCTION, 2005	3.16
FIGURE 3.2	US ETHANOL PRODUCTION, 2006	3.17



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

LIST OF TABLES

<u>TABLE #</u>	<u>TABLE DESCRIPTION</u>	<u>PAGE #</u>
TABLE 3.1	POPULATION OF HIGH PLAINS CORRIDOR REGION, 1990-2000	3.2
TABLE 3.2	POPULATION IN TOWNS AND CITIES ALONG HIGHWAYS 385 AND 40, 1990-2005	3.3
TABLE 3.3	POPULATION FORECASTS, 2035	3.4
TABLE 3.4	EMPLOYMENT IN HIGH PLAINS CORRIDOR REGION, 1995-2005	3.5
TABLE 3.5	JOB IN HIGH PLAINS CORRIDOR REGION, 2035	3.6
TABLE 3.6	TOP SELLING INDUSTRIES IN HIGH PLAINS CORRIDOR COUNTIES, 2002	3.9
TABLE 3.7	TOP HARVESTED CROPS, 2002	3.10
TABLE 3.8	OIL AND GAS PRODUCTION, 2006	3.11
TABLE 3.9	REAL CHANGE IN LAND VALUATION FOR OIL & GAS PRODUCTION, 2000-2005	3.11
TABLE 3.10	ASSESSMENT OF LAND WITH OIL & GAS PRODUCTION, 2000-2005	3.12
TABLE 3.11	2030 BENEFITS OF INCREASED TRANSPORTATION SPENDING, STATE OF COLORADO	3.22
TABLE 4.1	REGION 4 PROJECTS	4.3
TABLE 4.2	REGION 1 PROJECTS	4.5
TABLE 5.1	CDOT 2008-2035 PLAN CONTROL TOTALS	5.4
TABLE 5.2	CDOT PROGRAMS	5.5
TABLE 5.3	COLORADO PUBLIC UTILITIES COMMISSION	5.7
TABLE 5.4	BORROWING PROGRAMS	5.8
TABLE 5.5	TAXING TOOLS / MECHANISMS AVAILABLE TO LOCAL JURISDICTIONS	5.9
TABLE 5.6	US DEPARTMENT OF AGRICULTURE	5.10
TABLE 5.7	ECONOMIC DEVELOPMENT ADMINISTRATION	5.10
TABLE 5.8	COLORADO STATE RESOURCES	5.11



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

LIST OF CHARTS

<u>CHART #</u>	<u>CHART DESCRIPTION</u>	<u>PAGE #</u>
CHART 3.1	POPULATION PROJECTIONS IN THE HIGH PLAINS CORRIDOR REGION, 2000-2035	3.4
CHART 3.2	JOB IN THE HIGH PLAINS REGION, 2005	3.6
CHART 3.3	COLORADO AGRICULTURAL INDUSTRY, SALES IN 2005	3.7
CHART 3.4	LEADING COLORADO COUNTIES IN MARKET VALUE OF GOODS SOLD, 2002	3.8
CHART 3.5	PROJECTED GROWTH IN RENEWABLE ENERGY, 2005-2015	3.14
CHART 3.6	RENEWABLE ENERGY INVESTMENT AS A PORTION OF ALL VENTURE CAPITAL INVESTMENTS, 1999-2005	3.15



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN EXECUTIVE SUMMARY

BACKGROUND, PURPOSE, AND PROCESS

The High Plains Highway is a 222-mile corridor that begins near Kit Carson and ends at I-80 in Nebraska. It was identified as a corridor connector in the Eastern Colorado Mobility Study. The High Plains Highway Corridor Coalition (HPHC) – a formal association of towns and counties along the corridor - asked the Colorado Department of Transportation (CDOT) to assist the member communities in developing a plan for the corridor to anticipate and prioritize future corridor transportation needs.

Historically, the corridor has functioned as the lifeblood for the agricultural communities and activities along it, carrying a substantial and growing proportion of truck traffic. The corridor's recent rising prominence in the alternative energy industry has significantly contributed to the growth in truck traffic, especially oversize loads. Because much of the corridor was likely incorporated into the US Highway system from county roadways, these types of traffic are becoming increasingly incompatible with some of the curves, grades, communities, and in particular the general absence of shoulders. Accordingly, the key outcome of the Plan is a list of prioritized improvement projects, citing potential funding sources, and related implementation issues.

The Plan was developed with continuous involvement by the towns, cities, and counties who were responsible for developing and prioritizing the list of potential corridor improvement projects. Per the adoption of this Plan, the HPHC will take on responsibility for updating this Plan as appropriate. The agencies will be responsible for carrying these projects through the statewide transportation planning process via the Transportation Planning Commission.

To develop this Plan, Steering and Technical Committees were formed by the governmental entities by appointing their respective representatives. The Steering Committee (SC) provided overall guidance regarding the details of the Plan developed by the Technical Committee (TC). Ten entities were involved in the preparation of the Plan with CDOT via these committees and one-on-one discussions:

- The Towns and Cities of Burlington, Cheyenne Wells, Holyoke, Julesburg and Wray
- The Counties of Cheyenne, Kit Carson, Phillips, Sedgwick and Yuma

Discussions were also conducted with agencies in Nebraska where access occurs between US 385 and I-80 near Chappell and also via Colorado State Highway 11 and Deuel County (Nebraska) Road 27 regarding how to best identify and/or designate the corridor in that area. These agencies included the Nebraska Department of Roads (NDOR), Deuel and Cheyenne Counties, and the Towns of Chappell and Sidney.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

EXECUTIVE SUMMARY

A series of public information meetings was held in the corridor once a draft list of prioritized projects was developed. Feedback and support for the Plan was expressed in each of the five meeting locations.

Several key themes were established with the Steering and Technical Committees to be used in developing and executing the Plan.

- Projects were prioritized based on criteria developed by and consistent with local agency goals.
- The Plan will:
 - become the local agency's tool to vie for funding in the statewide project prioritization and funding process
 - become the involved local agency's best opportunity to obtain funding for corridor projects
 - allow local agencies to continue, over time, to monitor and revisit corridor conditions; modify the Plan as appropriate; and maintain support for corridor projects through future CDOT planning and funding cycles.
- Current transportation funding levels will need to increase before projects can be constructed along the Corridor.
- Several of the local agencies expressed an interest in partnering with CDOT to perform roadside grading for shoulder improvements, provide and/or transport paving and embankment materials, and/or acquire right-of-way of way to prepare for eventual shoulder construction. These types of partnerships would build upon strong, existing working relationships between the local agencies and CDOT. The agencies were briefed on the need to account for state and federal requirements and considerations regarding engineering, safety and funding viability. The benefits of leveraging certain aspects of jointly-conducted projects (such as traffic control and erosion control) were also discussed with the local agencies.
- Local agencies may participate in such improvements by accounting for these requirements and considerations. CDOT is fully willing to entertain partnership opportunities and will facilitate this process by coordinating any future resurfacing and construction projects with the prioritized list of projects, offering permitting assistance to local agencies, and being vigilant for creative partnering opportunities.
- The overall corridor costs are significant, well exceeding the funding that could reasonably be expected for the corridor within the foreseeable future. By developing this Plan with broad agency support and including commitments to local supporting actions such as the facilitation of shoulder improvements, the likelihood of prioritized improvements and opportunities for funding will be greatly enhanced when any additional revenues become available. The importance of developing a plan and achieving and maintaining local support for the plan cannot be overstated.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN EXECUTIVE SUMMARY

CORRIDOR ASSESSMENT

A unique aspect of travel in the corridor is that approaching and passing maneuvers can be precarious due to the general absence of shoulders when agricultural and large commercial vehicles are involved. This is especially true traveling into and out of the river valleys where there are steep, high side slopes in fill sections. Oversize loads are notable among the large vehicles and typically have consisted of mining equipment, wind towers, and wells. Typical commercial vehicle loads are agricultural products, grain, and livestock. Grain elevators are located in every town along the High Plains Highway Corridor and in most of those in proximity. With the recent growth in renewable fuels production such as biodiesel and E85, increased transport will likely occur along the corridor of these fuels, the grain products used to manufacture these, and the byproducts.

Five factors were cited as contributing to current and potential corridor problems:

- Absence of usable shoulders
- Steep roadside slopes
- Steep grades
- Limitations to visibility of approaching vehicles through curves, over crests and at intersections
- The presence of oversize loads, especially wide vehicles

Several types of data were collected and reviewed to assess these core issues. These include:

- Accident histories
- Traffic counts
- Permitted load information
- Structure conditions
- Right-of-way widths
- Location of environmental features
- Pavement conditions

This information indicated that the combination of existing corridor conditions creates both demonstrated and potentially hazardous situations and locations. Accordingly, the following project prioritization criteria were agreed upon:

Improve safety – the degree to which an improvement can mitigate historic safety issues, or minimize potentially hazardous conditions (such as shoulder, roadside slope, and alignment deficiencies)



HIGH PLAINS HIGHWAY
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN
EXECUTIVE SUMMARY

Improve freight mobility – the degree to which an improvement can enhance the ability to move freight-carrying vehicles along the corridor

Support economic development – the degree to which an improvement potentially contributes to local or regional initiatives to stimulate, expand, or attract business

Compatibility with community objectives and issues – the degree to which an improvement is compatible with facilitating locally identified objectives or addressing locally identified issues

Improvement to travel time – the degree to which an improvement reduces travel delay

Accommodate elements of the natural environment - the degree to which an improvement can be implemented while minimizing the affects to the natural environment

Cost – the construction and right-of-way cost of an improvement in current dollars

Safety, freight mobility and economic development were cited as inter-related and as the most important criteria

PRIORITIES

Shoulders were identified as the primary improvement needed in the corridor. Safety as assessed by accident histories was the primary factor considered to prioritize specific shoulder improvement locations. Shoulders would likely be constructed by combining these improvements with other improvement projects in proximity to intersections or curves, in addition to any stand-alone projects. Typical implementation considerations will include adequacy of right-of-way, terrain, and the absence or presence of other physical constraints.

A list of approximately 60 intersections, curves, and a select group of relatively narrow structures were also identified for improvements. These projects were prioritized with a key emphasis on safety. Focus was placed on locations with a demonstrated accident history as well as proximity to school areas. The need to address flooding was cited due to the constrained height beneath the South Fork of the Republican River Bridge as well as a need to widen the bridge over I-70. The City of Burlington included development of an alternative truck route north of the town. Cheyenne Wells included construction of a new alignment to establish a more direct connection to US 40, eliminating the need for large vehicles to negotiate the pair of 90-degree turns within the town.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND AND PURPOSE

This Corridor Development and Management Plan (CDMP) for the High Plains Highway identifies and prioritizes current and anticipated improvements for this 222-mile corridor. The High Plains Highway begins near Kit Carson and ends near Interstate 80 in Nebraska. Beginning at the junction of US 40 and 287 in Kit Carson and proceeding east along US 40 to Cheyenne Wells, the corridor then continues north along US 385 through Burlington, Wray, Holyoke and Julesburg before turning northwest towards Chappell, Nebraska. Figure 1.1 depicts the corridor.

The High Plains Highway was identified as a corridor connector in the Eastern Colorado Mobility Study, (April 2002). The High Plains Highway Corridor has been identified as a priority corridor by the Eastern Transportation Planning Region (ETPR) due to ongoing and anticipated changes in international trade, and in energy-related and agricultural industries.

The High Plains Highway Corridor Coalition requested that the Colorado Department of Transportation (CDOT) assist the member communities in developing a plan for the corridor, anticipating and prioritizing future corridor transportation needs. The key element of this Plan is a list of prioritized projects, along with potential funding sources and related implementation issues. These projects have been prioritized based on criteria developed by and consistent with goals of the involved local agencies.

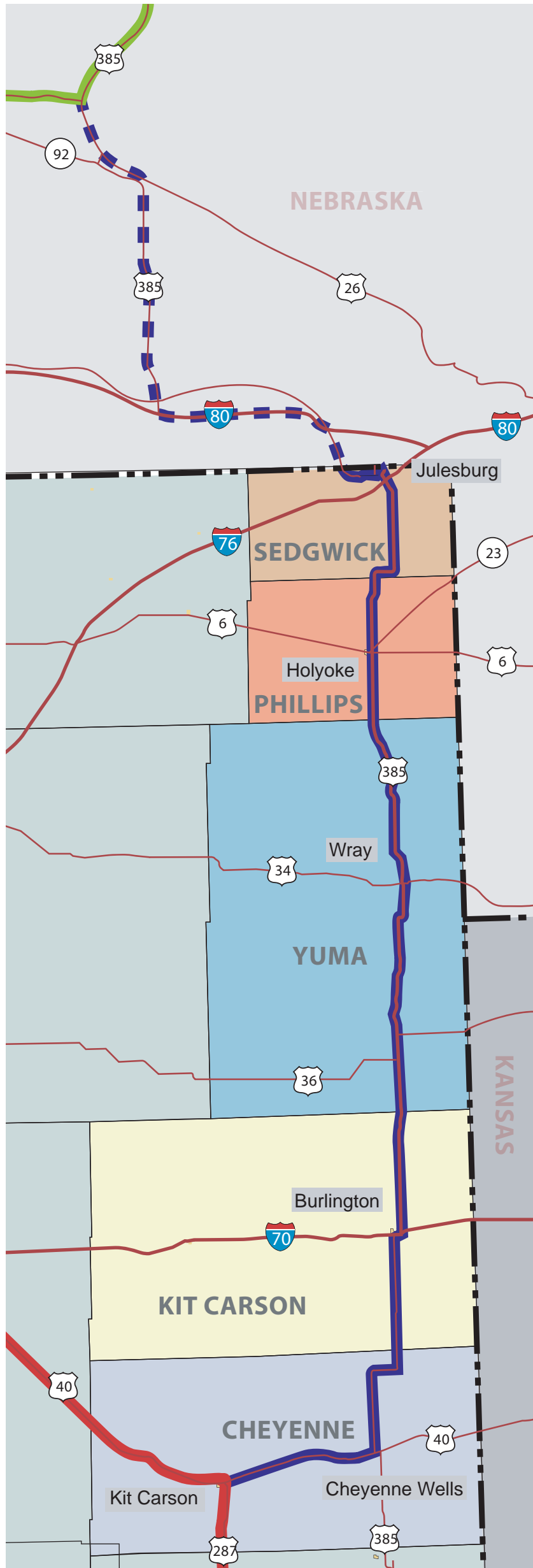
The types of projects include shoulder construction and widening, intersection improvements, curve modifications and others. This Plan provides the stakeholder communities with the necessary information to help facilitate their role in CDOT's transportation planning process, and serve as a beginning point for CDOT to identify future project development, right-of-way and environmental clearance procedures in the corridor. An assessment of the corridor's value and the benefits of transportation improvements within it are included. Recommendations are included for potential improvements to signing along with possible traveler information devices and related systems.

1.2 STAKEHOLDER INVOLVEMENT

This CDMP was developed through intensive engagement of staff and elected officials from the following agencies:

- The Towns and Cities of Burlington, Cheyenne Wells, Holyoke, Julesburg and Wray
- The Counties of Cheyenne, Kit Carson, Phillips, Sedgwick and Yuma





LEGEND

- █ = High Plains Highway Corridor
- █ = Ports to Plains Corridor
- █ = Heartland Expressway



Not to Scale



JULY 2007

**HIGH PLAINS HIGHWAY
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN**

FIGURE 1.1 - HIGH PLAINS HIGHWAY CORRIDOR

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Discussions were also conducted with agencies in Nebraska where access occurs between US 385 and I-80 near Chappell and also via Colorado State Highway 11 and Deuel County (Nebraska) Road 27 regarding how to best identify and/or designate the corridor in that area. These agencies included the Nebraska Department of Roads (NDOR), Deuel and Cheyenne Counties, and the Towns of Chappell and Sidney.

Steering and Technical Committees were formed by the governmental entities to develop the CDMP by appointing representatives from each entity. The Steering Committee provided overall guidance regarding the details of the Plan developed by the Technical Committee. These committees also provided economic and other development information. The general public was engaged to solicit input on the prioritized projects list.

1.3 PROJECTS PRIORITIZATION CRITERIA

The stakeholder agencies agreed to the following project prioritization criteria:

Improve safety – the degree to which an improvement can mitigate historic safety issues, or minimize potentially hazardous conditions (such as shoulder, roadside slope, and alignment deficiencies)

Improve freight mobility – the degree to which an improvement can enhance the ability to move freight-carrying vehicles along the corridor

Support economic development – the degree to which an improvement potentially contributes to local or regional initiatives to stimulate, expand or attract business

Compatibility with community objectives and issues – the degree to which an improvement is compatible with facilitating locally identified objectives or addressing locally identified issues

Improvement to travel time – the degree to which an improvement reduces travel delay

Accommodate elements of the natural environment - the degree to which an improvement can be implemented while minimizing the affects to the natural environment

Cost – the construction and right-of-way cost of an improvement in current dollars

Safety, freight mobility and economic development were cited as inter-related and as the most important criteria.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

1.4 IMPLEMENTATION – PARTNERSHIPS AND FUNDING

Several of the participating agencies expressed an interest in participating in the construction of shoulder improvements by potentially conducting roadside grading, providing embankment material, or acquiring right-of-way. These types of partnerships would build upon strong, existing working relationships between the local agencies and CDOT. This Plan includes information regarding the key engineering, regulatory and safety requirements which the local entities will need to coordinate with CDOT to ensure any such actions will be durable, effective, and allow for opportunities to attract funding from sources such as federal agencies.

Funding options and implementation considerations are identified, as are costs for potential improvement projects within the prioritized list.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

2.0 CORRIDOR ASSESSMENT

A unique aspect of travel in the corridor is that approaching and passing maneuvers can be precarious when agricultural and large commercial vehicles are involved due to the general absence of shoulders. This is especially true traveling into and out of the river valleys where there are steep, high side slopes in fill sections. Oversize loads are notable among the large vehicles and typically consist of mining equipment, wind towers, and wells. Typical commercial vehicle loads include agricultural products, grain, and livestock. With grain elevators located in every town along the High Plains Corridor and in most of those in proximity, and with the recent growth in renewable fuels production such as biodiesel and E85, increased transport will likely occur in the corridor of these fuels, the grain products used to manufacture these, and the byproducts.



Picture 2.1: Large load southbound immediately south of I-70; estimated width of 18'-20'

Five factors have been cited as contributing to current and potential corridor problems:

- Absence of usable shoulders
- Steep roadside slopes
- Steep grades
- Visibility of approaching vehicles through curves, over crests and at intersections
- The presence of oversize loads, especially wide vehicles



Picture 2.2: Large load northbound at US 36; estimated width of 18'-20'

Accordingly, several types of data were collected and reviewed to assess these core issues. These include:

- Accident histories
- Traffic counts
- Permitted load information
- Pavement conditions
- Right-of-way widths
- Structure conditions
- Location of environmental features

Figures 2.1 through 2.7 present these data over the length of the corridor.

Year 2002 - 2004 Crash Severity Summary

Crash Severity	Quantity
Property Damage Only	150
Injury	65
Fatality	5
Total	220

Year 2002 - 2004 Crash Type Summary

ACCIDENT TYPE	TOTAL	
	No.	%
Fixed Object	43	20%
Overtake	43	20%
Animal	31	14%
Broadside	23	10%
Rear End	21	10%
Embankment	12	5%
Overtaking Turn/Sideswipe: Same Direction	11	5%
Parked Car	11	5%
Other	10	5%
Sideswipe: Opposite Direction	8	4%
Pedestrian	4	2%
Head On	2	1%
Approach Turn	1	0%
Total	220	100%

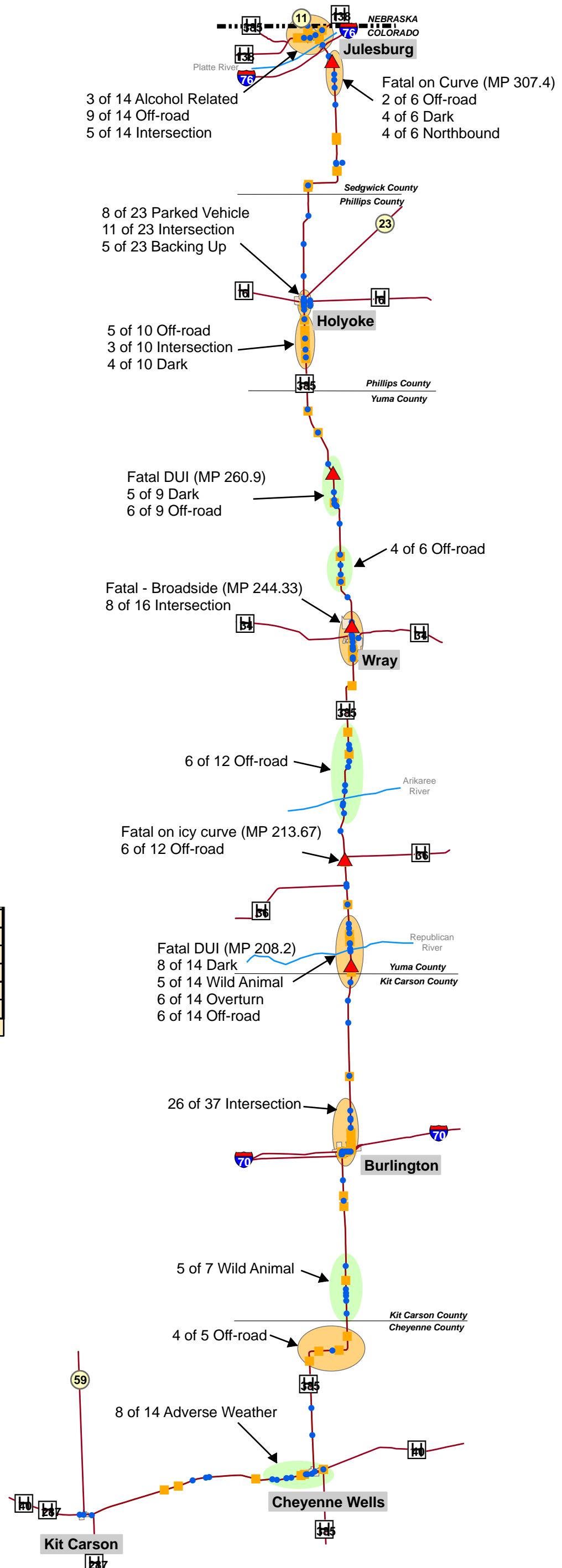
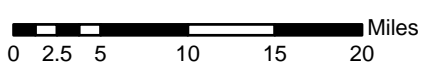
Year 2002 - 2004 Vehicle Type Summary

VEHICLE TYPE	No.	%
Passenger Car/Van	114	52%
Pickup Truck/Utility Van	58	26%
Truck/Bus	37	17%
Motorcycle/Motorized Bicycle	4	2%
Other	7	3%
Total	220	100%

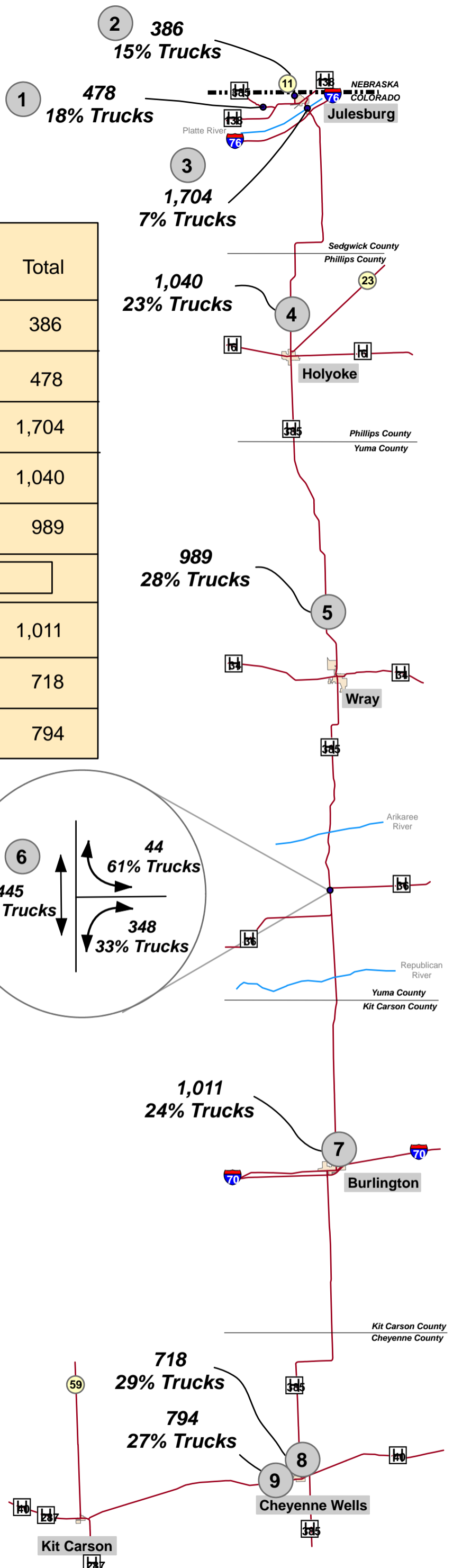
LEGEND

Crash Severity

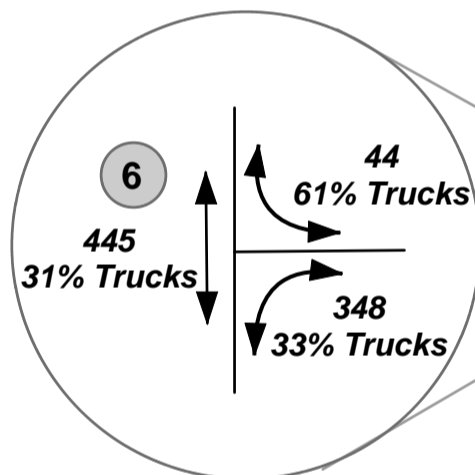
- ▲ Fatal Crash Location
- Injury Crash Location
- Property Damage Only Crash Location
- Safety Examination Area (at or below statewide average)
- Safety Examination Area (above statewide average)



Count Location	Cars	Trucks	Oversize	Farm Equipment	Total
1	330	56	0	0	386
2	390	88	0	0	478
3	1,583	116	1	4	1,704
4	794	239	6	1	1,040
5	645	341	0	3	989
6	See Inset				
7	768	239	4	0	1,011
8	507	206	4	1	718
9	573	218	2	1	794



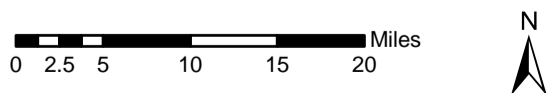
Notes: Count date for locations 1 through 5 is 10/16/2006
 Count date for locations 6 through 9 is 11/1/2006
 All data extrapolated to a 24-hour count period using 24-hour count taken 11/1/2006



Legend

1,011 24-hour volume

24% Trucks Percent of truck traffic at location



US-385 Corridor Permitted Vehicle (Oversize/Overweight) Sources and Destinations Summary

	Percentage
Nebraska (to/from the north)	1%
Interstate 76	4%
US-6	28%
US-34	9%
US-36	14%
Interstate 70	10%
US-40	4%
South of study area	30%

Source: CDOT Permits Office - 1/2003 through 8/2006

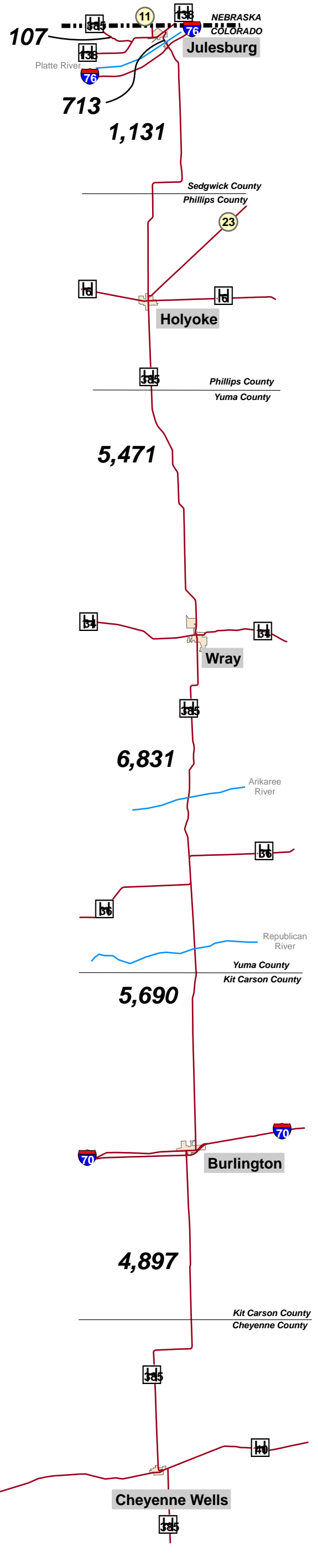
US-385 Corridor Regional Truck Origin/Destination Summary

Originate in Corridor, and Leaves Corridor: 299 permits (3.3%)
 Originate Outside of Corridor, and End in Corridor: 488 permits (5.4%)
 Originate and End in Corridor: 12 permits (0.1%)
 Originate and End Outside of Corridor: 8,220 permits (91.1%)




 Total permitted loads on US-385: 9,019

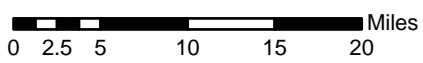
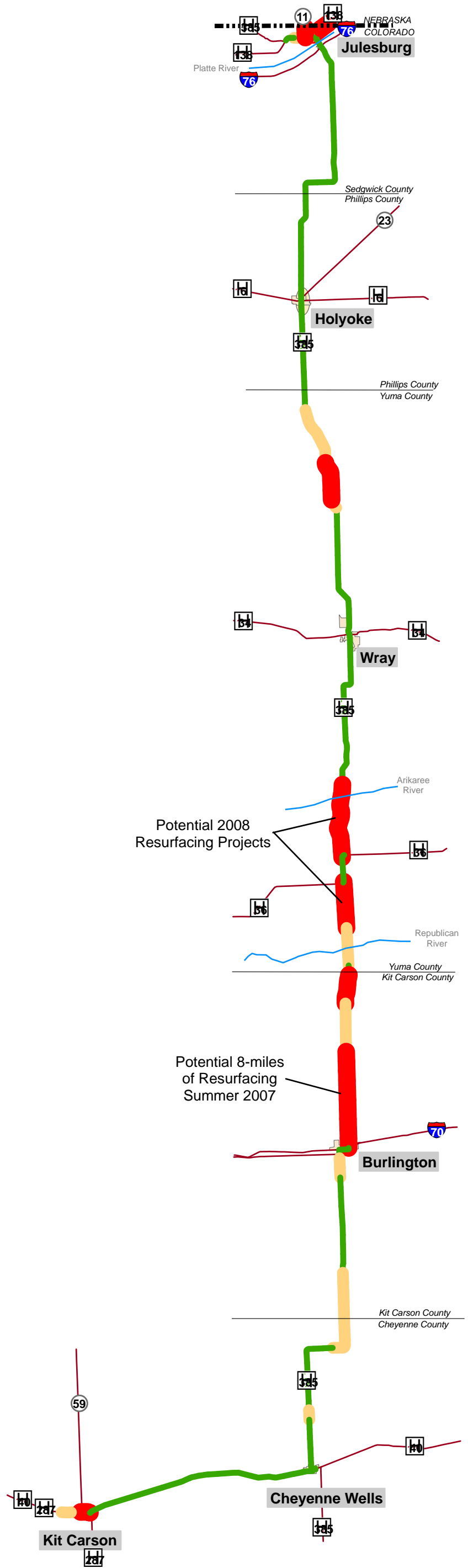
Legend

4,897 - Total Permitted Loads






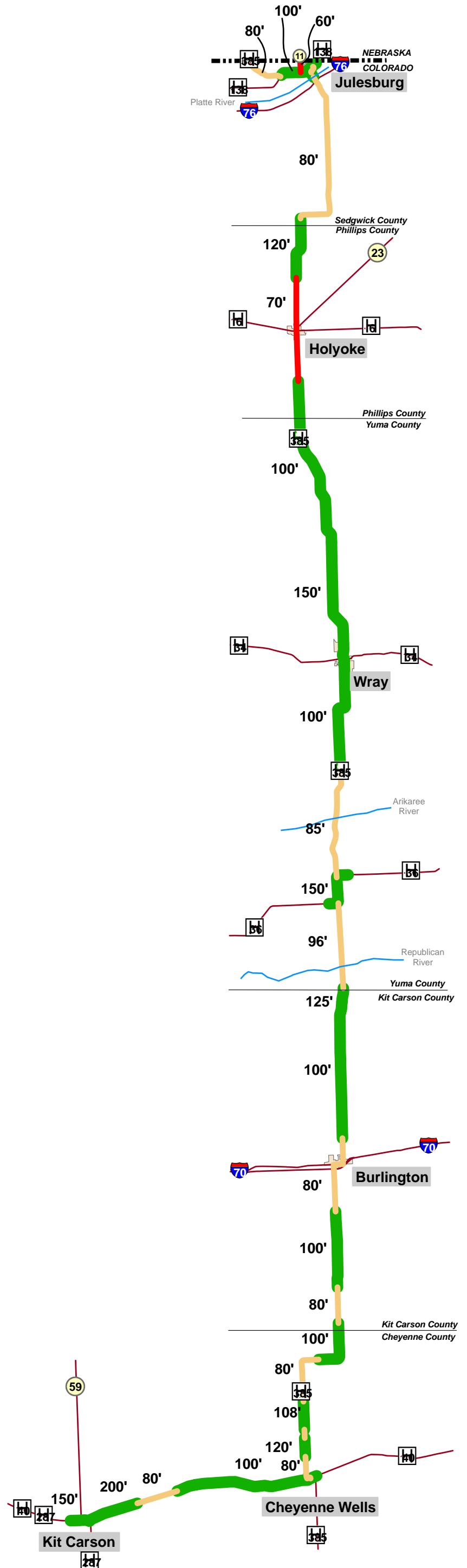
Surface Condition Summary

Surface Condition	Length (miles)
"Good" 	129
"Fair" 	36
"Poor" 	32
Total Mileage:	202



Existing Right of Way Summary

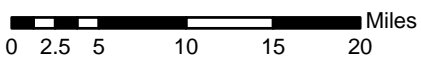
Right of way	Length (miles)
100' or Greater 	120
80' to 99' 	70
Less than 80' 	12
Total	202



Note: All ROW data was assembled from the CDOT Highway Data Sheets
HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

FIGURE 2.5 - HIGHWAY RIGHT OF WAY

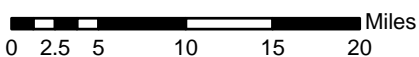
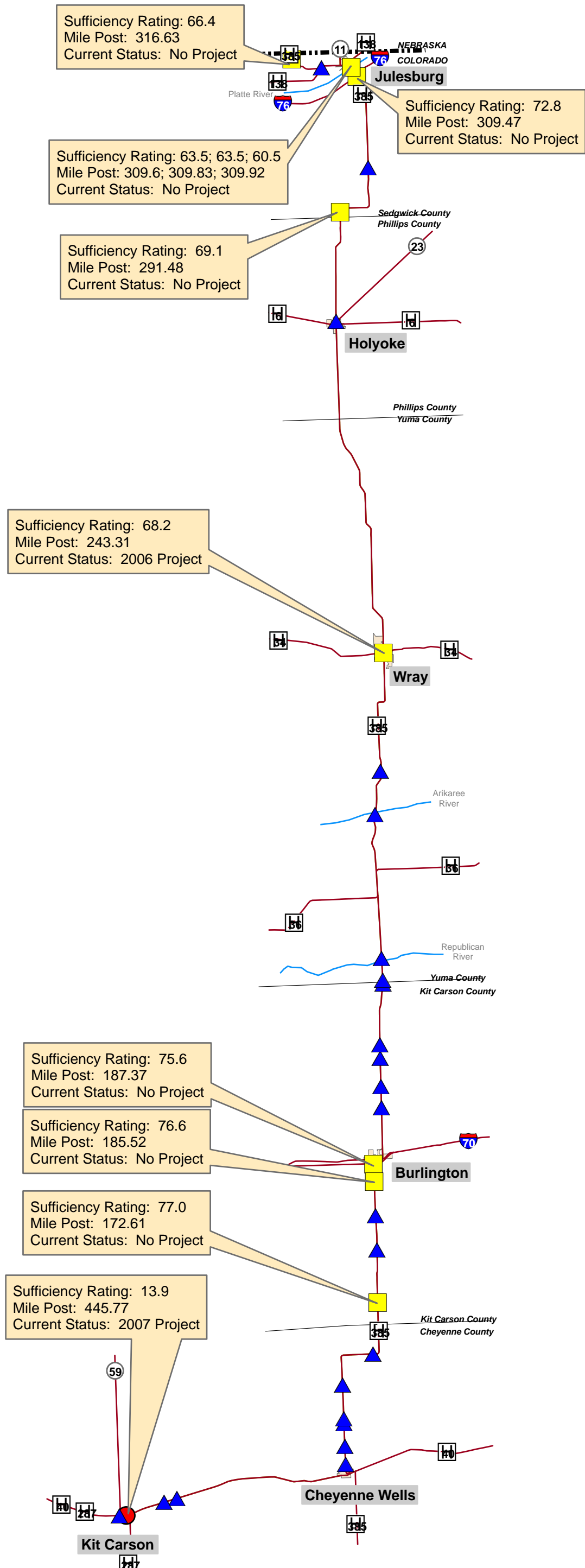


Structure Condition	Quantity
Good	25
Fair	10
Poor	1

LEGEND

Sufficiency Ratings

- Less than 50 (Poor Condition)
- 51 to 79 (Fair Condition)
- ▲ 80 or Greater (Good Condition)






Source: CDOT Staff Bridge

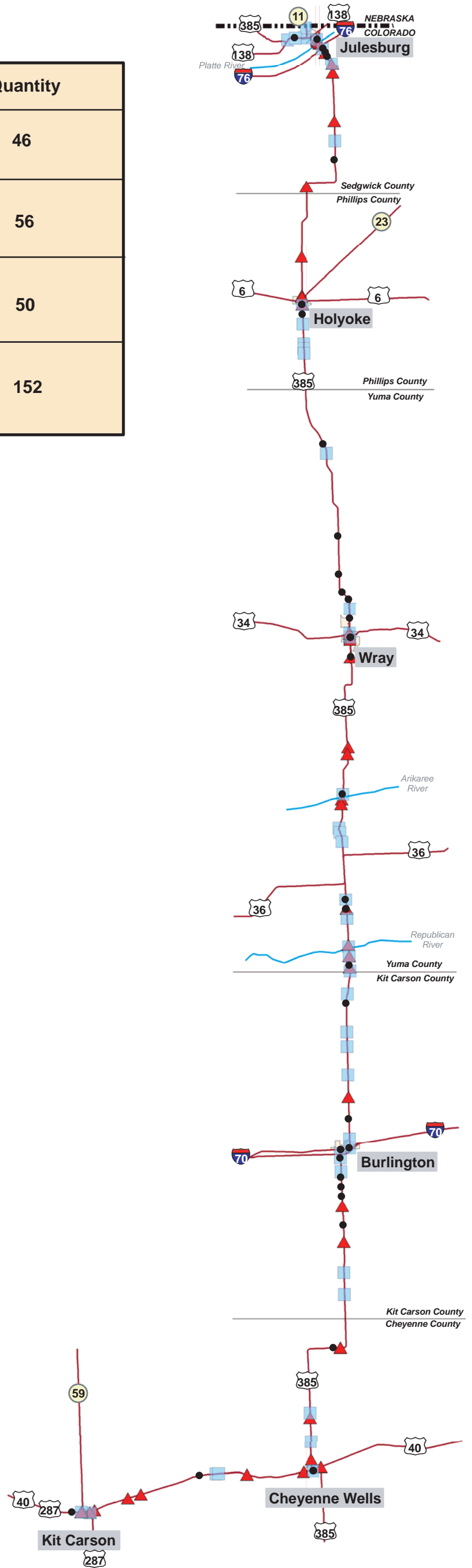
HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

FIGURE 2.6 - STRUCTURE LOCATIONS AND SUFFICIENCY RATINGS



Environmental Sensitivity Summary

	Quantity
 Higher probability of environmental clearance requirements	46
 Moderate probability of environmental clearance requirements	56
 Lower probability of environmental clearance requirements	50
Total:	152



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

This information indicates that the combination of existing corridor conditions creates both demonstrated and potentially hazardous situations and locations. It also indicates the need to address the following issues and considerations to improve the corridor:

- Of the 220 accidents that occurred in the corridor between 2002 and 2004:
 - 160 occurred within relatively concentrated clusters
 - About half of the accidents were potentially related to specific corridor conditions (e.g., those involving collisions with objects off the roadway or with a wild animal)
 - About 25% occurred at intersections
 - 5 were fatalities
 - 17% involved trucks
 - 18 wildlife-vehicle collisions occurred, mostly near a drainageway just north of the Cheyenne/Kit Carson county line
- Of the 20 accidents involving fatalities that occurred in the corridor between 1994 (the earliest year of available data) and 2004:
 - 9 involved alcohol or medication impairment
 - 15 occurred in darkness or near dawn or dusk
 - 11 occurred off the roadway
 - 6 occurred at driveways or intersections
- Most of the corridor carries about 1000 vehicles daily, with about 25% of that being trucks.
- About 6 permitted vehicles (oversize, overheight, or overweight) travel through the corridor daily, with this number dropping to 1 or 2 north of Holyoke. (This number does not include loads of this nature with annual permits, nor local agricultural vehicles not required to have a permit.)
- About 90% of these loads pass through the corridor without stopping, with slightly less than one-third entering or exiting the corridor at both US 6 and at the south end of the corridor. This is indicative of the importance of the corridor as a north-south freight route and a connector corridor between the Ports to Plains Corridor at Kit Carson and the Heartland Expressway in Nebraska.
- Both US 385 and US 40 are designated by the State as hazardous materials transport routes.



Picture 2.3: Steep side slopes in the Black Wolf Creek area

HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

- The pavement width over the majority of the corridor is approximately 24 feet, although some segments have begun to erode to less than this width, especially in areas with steep fill slopes.
- Many intersections, crests and curves have sight distance conditions that are perceived as hazardous.
- Maneuvering large vehicles can cause periodic delays at several locations. These include the two, constrained 90-degree turns along US 385 within Cheyenne Wells, the intersection of Lincoln Avenue/Rose Avenue (US 385/24) in Burlington, US 6/385 in Holyoke, and the north intersection of the US 138/385 interchange on the south side of Julesburg.



Picture 2.4: Wind turbine tower segment at 90-degree turn westbound to northbound in Cheyenne Wells

- Nearly all structures in the corridor are in good condition and do not require replacement or significant maintenance, although several narrow structures exist. The bridges over the South Fork of the Republican River have little available clearance above the riverbed such that impassable flooding of US 385 results even with relatively minor upstream storm events.
- Right-of-way widths in the corridor generally range from 70-feet to 150-feet with 80-foot and 100-foot widths being most common; the areas needing the greatest widths to accommodate improvements – the grades on the edges of the river valleys – typically have relatively narrow right-of-way to accommodate such improvements.
- Most of the corridor has adequate pavement conditions, with proposed resurfacing projects planned for the remaining sub-standard conditions.
- The most environmentally sensitive locations are the river, stream and other waterway crossings.

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

3.0 CORRIDOR VALUE AND BENEFITS

This section describes the “value” of the Highway 385 and 40 region to the State of Colorado, including:

- Population and employment trends
- Economic trends
- Future energy-related industries

As with many rural areas in the West, the communities along the corridor have been affected by larger-scale demographic and economic trends including changes in U.S. and international agricultural policies, changes in farming practices and technologies, as well as the demographic shift of the population to the cities and suburbs. Rural Colorado remains highly valued because of its current economic contributions to the state and its potential highly valuable future role in the renewable energy industries.

3.1 POPULATION AND EMPLOYMENT TRENDS

Population

The High Plains Highway Corridor communities include the:

- The towns and cities of Burlington, Cheyenne Wells, Holyoke, Julesburg, and Wray
- The counties of Cheyenne, Kit Carson, Phillips, Sedgwick, and Yuma

The populations of the towns, cities, and counties have remained relatively stable between 1990 and 2005 (see Table 3.1 and 3.2). Phillips, Yuma and Kit Carson Counties grew during this time, while Sedgwick and Cheyenne Counties dropped slightly in population. The population of the High Plains Highway Corridor Counties was 27,379 in 2005, up about 2,000 persons from 1990’s population of 25,369 (see Table 3.1). From 1990 to 2005, the average annual growth rate for the High Plains region was 0.5 percent, compared to the state which grew at an annual growth rate of 2.4 percent.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Table 3.1
Population of High Plains Corridor Region, 1990-2000**

County	1990	2000	2005 Est	Change 1990-2005	2005 % of Total
Sedgwick County	2,690	2,747	2,668	-22	9.7%
Phillips County	4,189	4,480	4,631	442	16.9%
Yuma County	8,954	9,841	9,979	1,025	36.4%
Kit Carson County	7,140	8,011	7,889	749	28.8%
Cheyenne County	2,396	2,231	2,212	-184	8.1%
Total All Counties	25,369	27,310	27,379	2,010	100.0%

Sources: DOLA, US Census, ArLand

Forty percent of the population in the counties resides within the towns and cities along Highways 385 and 40. Although Cheyenne County lost population during 1990-2005, the rest of the region grew by 2,010 persons. In Sedgwick County, the town of Julesburg grew while the rest of the county declined slightly in population.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 3.2
Population in Towns and Cities Along Highways 385 and 40, 1990-2005

Place	1990	2000	2005 Est	Change 1990-2005	2005 % of County
Sedgwick County	2,690	2,747	2,668	-22	
Julesburg	1,295	1,467	1,413	118	53%
Phillips County	4,189	4,480	4,631	442	
Holyoke	1,931	2,261	2,305	374	50%
Yuma County	8,954	9,841	9,979	1,025	
Wray	1,998	2,187	2,230	232	22%
Kit Carson County	7,140	8,011	7,889	749	
Burlington	2,941	3,678	3,818	877	48%
Cheyenne County	2,396	2,231	2,212	-184	
Cheyenne Wells	1,128	1,010	971	-157	44%
Kit Carson	305	253	237	-68	11%
Totals	25,369	27,310	27,379	2,010	40%

Sources: DOLA, US Census, ArLand

The Colorado Department of Local Affairs (DOLA) projects that population will remain somewhat stable in the region through 2035, growing at a relatively slow rate of change (0.5% annually). This projection represents an average over the next thirty years. Most of the population growth is expected to take place in Yuma County. Between 2005 and 2035, the High Plains Highway Corridor region is forecast to grow by over 4,800 persons for a total population of 32,133 by 2035. Table 3.3 and Chart 3.1 illustrate the estimated growth for the region.



HIGH PLAINS HIGHWAY

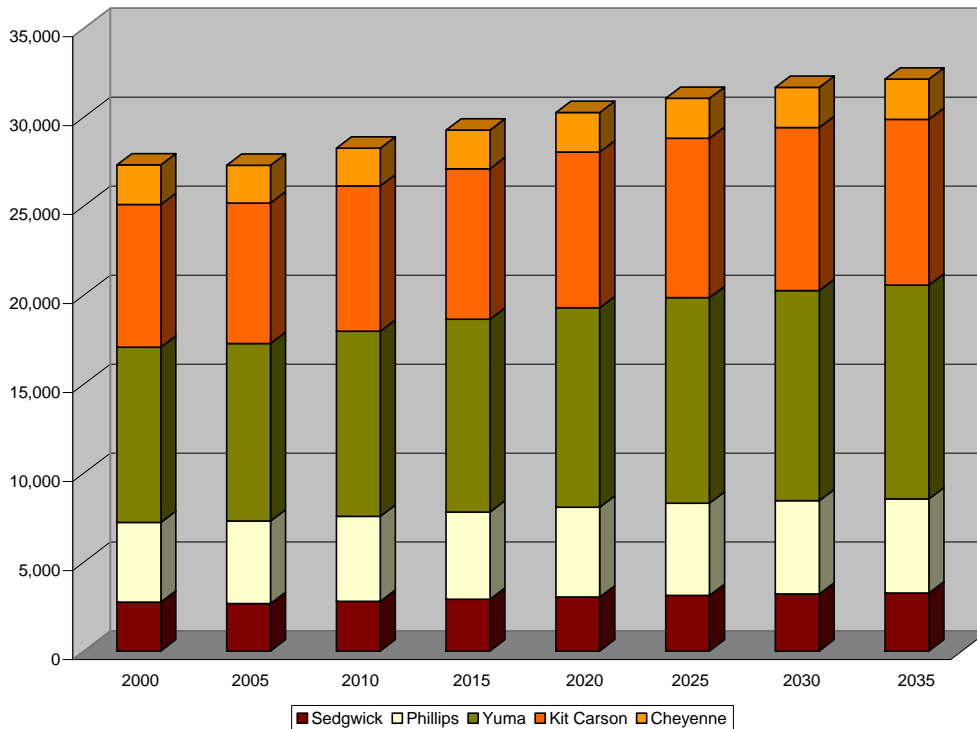
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 3.3
Population Forecasts, 2035

County	2035	
	Population Forecast	% of Total
Sedgwick	3,260	10.1%
Phillips	5,279	16.4%
Yuma	12,021	37.4%
Kit Carson	9,311	29.0%
Cheyenne	2,262	7.0%
Total	32,133	100.0%

Sources: DOLA, ArLand

Chart 3.1
Population Projections in the High Plains Highway Corridor Region, 2000-2035



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Employment

Employment in the High Plains Highway Corridor Region has remained relatively constant between 1995 and 2005, growing at an average annual rate of 0.2%. The number of jobs in 1995 was estimated at 15,084; by 2005, the region was estimated to have 15,376 jobs. Between 1995 and 2005, the region added 292 jobs with most of the jobs growth occurring in Yuma and Phillips County. The largest number of jobs in the region in 2005 was found in Yuma and Kit Carson Counties.

Table 3.4
Employment in High Plains Corridor Region, 1995-2005

County	1995	2000	2005	Change % of Total	
				1995-2005	2005
Sedgwick	1,440	1,558	1,468	28	9.5%
Phillips	2,364	2,653	2,501	137	16.3%
Yuma	5,401	5,904	5,513	112	35.9%
Kit Carson	4,519	5,081	4,482	-37	29.1%
Cheyenne	1,360	1,481	1,412	52	9.2%
Total	15,084	16,677	15,376	292	100.0%
Average Annual Growth Rate, 1995-2005					0.2%

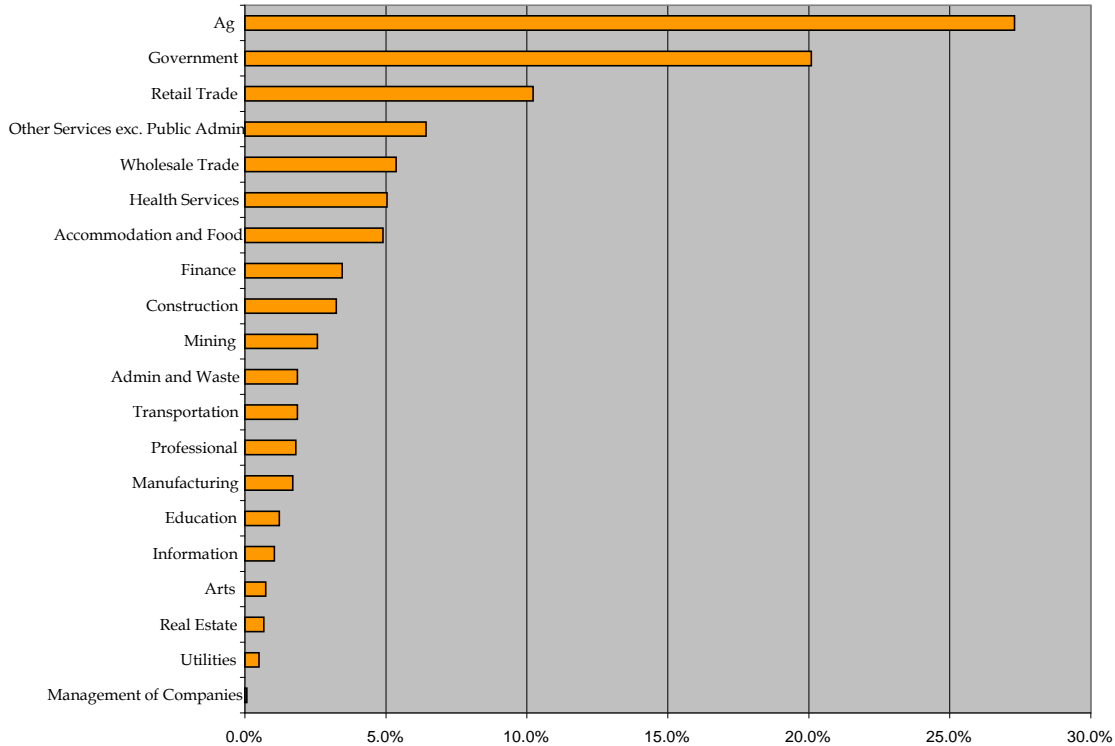
Sources: DOLA, ArLand

Most of the jobs in the region are agricultural (27 percent of all jobs), followed by jobs in government (at 20 percent) and jobs in the retail industry (10 percent). This jobs estimate includes part-time jobs and other than full time positions. There are also a significant number of jobs in the wholesale trade, accommodations and food services (hotels, motels, and restaurants) industries. Chart 3.2 depicts the distribution of occupations in the area.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Chart 3.2
Jobs in the High Plains Corridor Region, 2005**



Sources: DOLA, BEA, County Business Patterns, ES202, ArLand

Jobs in the region are forecast to grow at an average annual growth rate of 0.5% to 2035, when the overall total number of jobs is forecast at 17,630. The growth rate projection represents an average over the next thirty years. The majority of jobs are expected to be in Yuma County at 42 percent of total jobs. Table 3.5 shows the projected growth.

**Table 3.5
Jobs in High Plains Highway Corridor Region, 2035**

County	Jobs in 2035
Sedgwick	9.1%
Phillips	17.0%
Yuma	41.7%
Kit Carson	23.0%
Cheyenne	9.3%
Total	17,630

Sources: DOLA, ArLand



HIGH PLAINS HIGHWAY

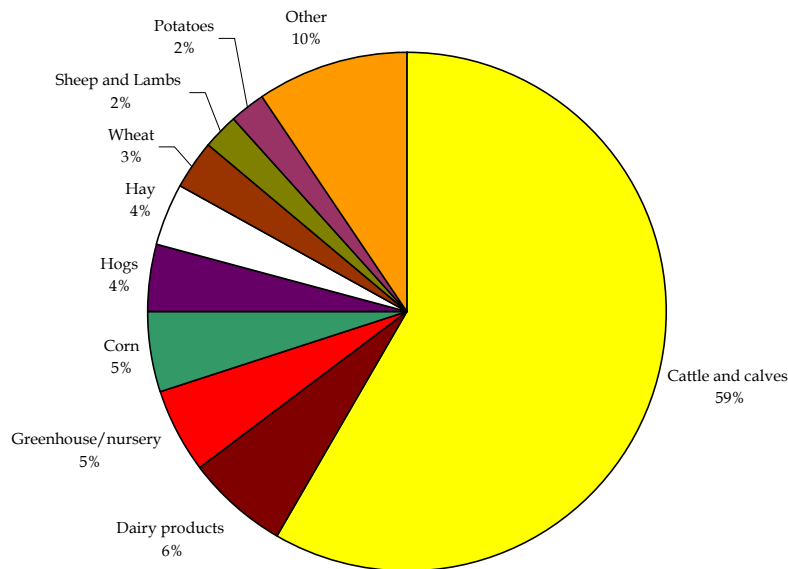
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

3.2 ECONOMIC TRENDS

Current Agricultural Trends

Agriculture is an important industry to the State of Colorado. The State is ranked 16th in the United States for total agricultural receipts generating over \$5 billion in sales in 2004. The state's largest agricultural industry is the cattle industry which generates 59 percent of all sales, followed by dairy products, greenhouse/nursery and corn. Chart 3.3 depicts the distribution of products.

Chart 3.3
Colorado Agricultural Industry, Sales in 2005

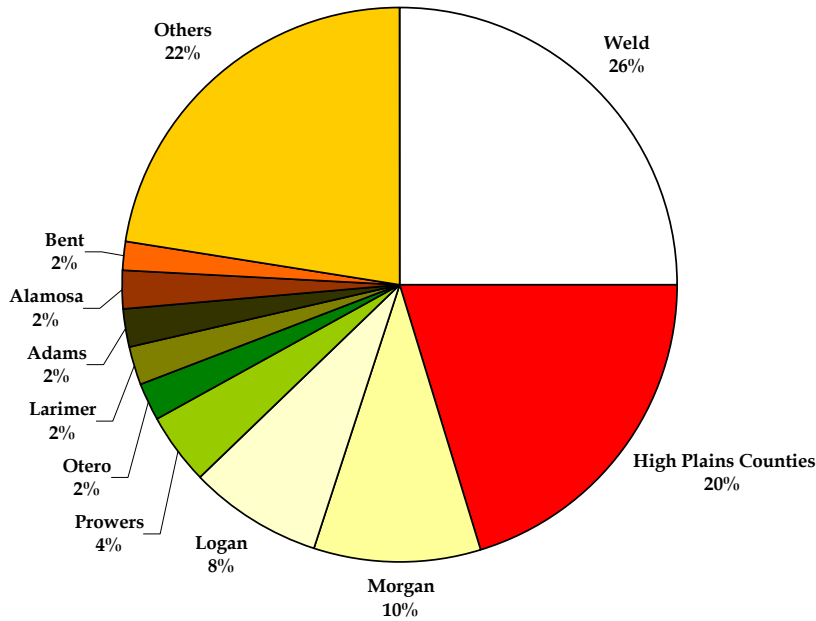


Sources: USDA, ArLand

Of the approximately \$5 billion in statewide receipts, approximately 20% of those receipts are generated in the High Plains Corridor Counties. Weld County is the top producing (in terms of receipts) county in the state, followed by the High Plains Corridor Counties (led by Yuma and Kit Carson Counties), and followed by Morgan and Logan Counties (which are not an immediate part of the region). Chart 3.4 shows the distribution of receipts.

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Chart 3.4
Leading Colorado Counties in Market Value of Goods Sold, 2002**



Sources: USDA, ArLand

Of the estimated 2.6 million head of cattle in the state of Colorado, Weld County is estimated to have the majority at 550,000 head of cattle; Yuma County is estimated to have over 270,000 head while Kit Carson County has over 150,000 head of cattle.

In addition to providing the most jobs, agriculture also provides economic wealth to the High Plains Highway Corridor Region in the form of sales. In 2002, it was estimated that all industries within the High Plains Highway Corridor counties sold approximately \$1.5 billion in goods and services with agriculture providing over 50 percent of all sales. Other significant industries include wholesale trade, utilities, and transportation. Table 3.6 shows these numbers.

HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 3.6
Top Selling Industries in High Plains Highway Corridor Counties, 2002

Industry	2002
Agriculture	52.4%
Wholesale trade	4.9%
Utilities	2.4%
Transportation	2.2%
Education	2.1%
Oil and gas	1.9%
Telecommunications	0.9%
Other	33.2%
Total (\$ Millions)	\$1,503

Sources: Minnesota IMPLAN data, 2002, CSU Cooperative Extension Fort Collins

The 2002 U.S. Census of Agriculture indicates that there are over 2,300 farms in the High Plains Highway Corridor region. There are slightly over 30,000 farms in the state of Colorado. Farms in the High Plains Region tend to be larger than average; the average farm size in the region is 1,700 acres compared to the statewide average of 990 acres. There is an estimated 4.1 million acres in farming in this region, comprising 13 percent of the statewide farming acreage of 31 million acres.

Crop production includes corn, wheat, sorghum, soybeans, beans, hay, sunflowers, and sugar beets. Top harvested crops in 2002 included corn, wheat, and sunflower seeds. Yuma County continues to be one of Colorado's top producing corn counties. In 2002, corn production was estimated at 33 million bushels; by 2005, estimated production had increased to 40 million bushels. Table 3.7 shows a breakdown of the top harvested crops in each county.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 3.7
Top Harvested Crops, 2002

County	Corn for Grain (Bushels)	Wheat for Grain (Bushels)	Sunflower Seed (Pounds)
Sedgwick	4,005,099	1,540,537	4,342,857
Phillips	12,436,394	2,237,278	962,649
Yuma	32,799,035	3,408,796	2,240,741
Kit Carson	10,237,642	3,609,864	6,071,703
Cheyenne	2,261,271	1,343,934	3,990,115
Total	61,739,441	12,140,409	17,608,065
Colorado	102,653,083	37,528,989	49,517,380

Sources: USDA Census of Agriculture, ArLand

Future agricultural production in the region will be impacted by the enforcement of the terms of the Republican River Basin Compact (impacting 7 counties – Kit Carson, Lincoln, Logan, Phillips, Sedgwick, Washington, and Yuma), where irrigation wells are set to be retired on 30,000 acres to meet contract compliance with Kansas. Although there will be less irrigated agriculture, dryland crops will provide important resources for ethanol and bio-diesel production.

Oil and Gas

Oil and gas production are significant industries in the region and property taxes generated are important sources of revenues for local governments. According to the Colorado Oil and Gas Commission, the High Plains Highway Corridor region produced nearly 8 percent of the state's oil and nearly 4 percent of its natural gas. Cheyenne County is most prominent in the production of oil, while Yuma County produces a significant amount of gas. Table 3.8 shows the production totals and percentages.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 3.8
Oil and Gas Production, 2006

County	Oil Production (barrels)	Oil Sales (barrels)	Gas Production (MCF) ¹	Gas Sales (MCF)
Sedgwick	1,180	1,106	50,202	50,202
Phillips	---	---	555,029	500,154
Yuma	---	---	35,681,515	34,242,834
Kit Carson	21,226	21,121	346,096	346,096
Cheyenne	1,650,506	1,646,848	7,210,341	1,393,231
Totals	1,672,912	1,669,075	43,843,183	36,532,517
State of Colorado	21,584,097	21,376,923	1,176,490,467	1,140,069,740
Region % of State	7.8%	7.8%	3.7%	3.2%

Sources: Colorado Oil and Gas Conservation Commission, ArLand

¹ Millions of Cubic Feet

Oil and gas land in Cheyenne County, in particular, contributes heavily to the property tax base of the county and has been growing steadily and significantly in value in the region (see Tables 3.9 and 3.10).

Table 3.9
Real Change in Land Valuation for Oil and Gas Production, 2000-2005

County	2000	2005	Average Annual Growth Rate
Sedgwick	15,039	261,470	77%
Phillips	1,361	8,610	45%
Yuma	39,178,416	91,691,180	19%
Kit Carson	3,050,922	2,244,367	-6%
Cheyenne	68,898,680	79,265,641	3%
Total	\$111,144,418	\$173,201,188	9%

Sources: DOLA, CSU Cooperative Extension Fort Collins, ArLand

Notes: Values in 2005 dollars.



HIGH PLAINS HIGHWAY
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 3.10
Assessment of Land with Oil and Gas Production, as a Percentage of Total Taxable Base, 2000-2005

County	2000	2005
Cheyenne	62%	67%
Yuma	22%	43%
Sedgwick	0%	1%
Phillips	0%	0%
Kit Carson	3%	2%

Sources: DOLA, Division of Property Taxation,
CSU Cooperative Extension Fort Collins

HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

3.3 FUTURE ENERGY RELATED INDUSTRIES

The High Plains Highway Corridor region is expected to continue to be a strong agricultural producer and contributor to Colorado's economy. Economic development and political leaders in the region are also excited about the prospect of the growth in the renewable energy industries, due to:

- Production has already begun to take place
- There is demonstrated future interest on the part of producers in this region
- There is a significant amount of potential natural resources

Improving the highway corridors and related transportation networks can help facilitate the growth of these industries. It also serves to improve the region's overall economic development prospects for the attraction of these businesses.

Nationally, there are a number of reasons why the renewable energy industries have become so attractive.

- Renewable energy technologies are becoming increasingly cost-competitive
- Renewable energy has become a national security priority
- There is a growing acceptance in the marketplace of renewable energy or alternative "natural" resources
- This is a potentially politically unifying issue

Recent Growth

Recent growth of renewable energy markets reflects its growing acceptance as potential energy resources. According to Clean-Tech Market Authority:

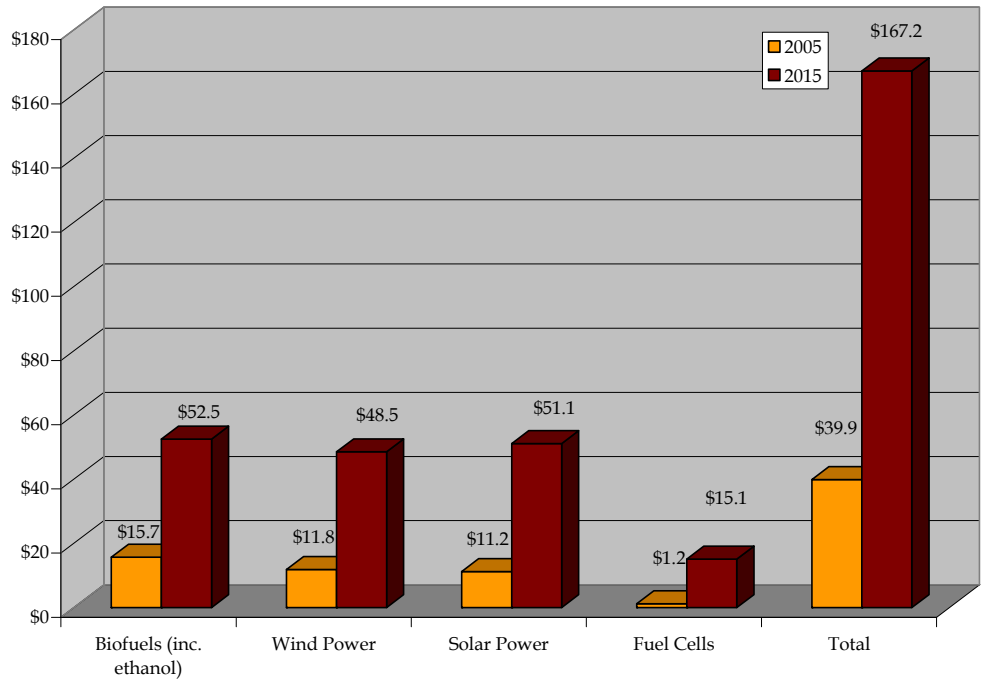
- Global wind and solar markets reached \$11.8 billion and \$11.2 billion in 2005 – up 47 and 55 percent from the previous year.
- The market for biofuels hit \$15.7 billion in 2005, up more than 15 percent from the year earlier
- Large multinationals like Archer Daniels Midland, BP, GE, Sharp, and Toyota have invested heavily in research and development in solar, wind, ethanol, and hybrid electric vehicles, among others

The global renewable energy market is projected to more than quadruple globally by 2015. Chart 3.5 shows recent and projected growth of these markets.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Chart 3.5
Projected Growth in Renewable Energy, 2005-2015 (\$Billions)**

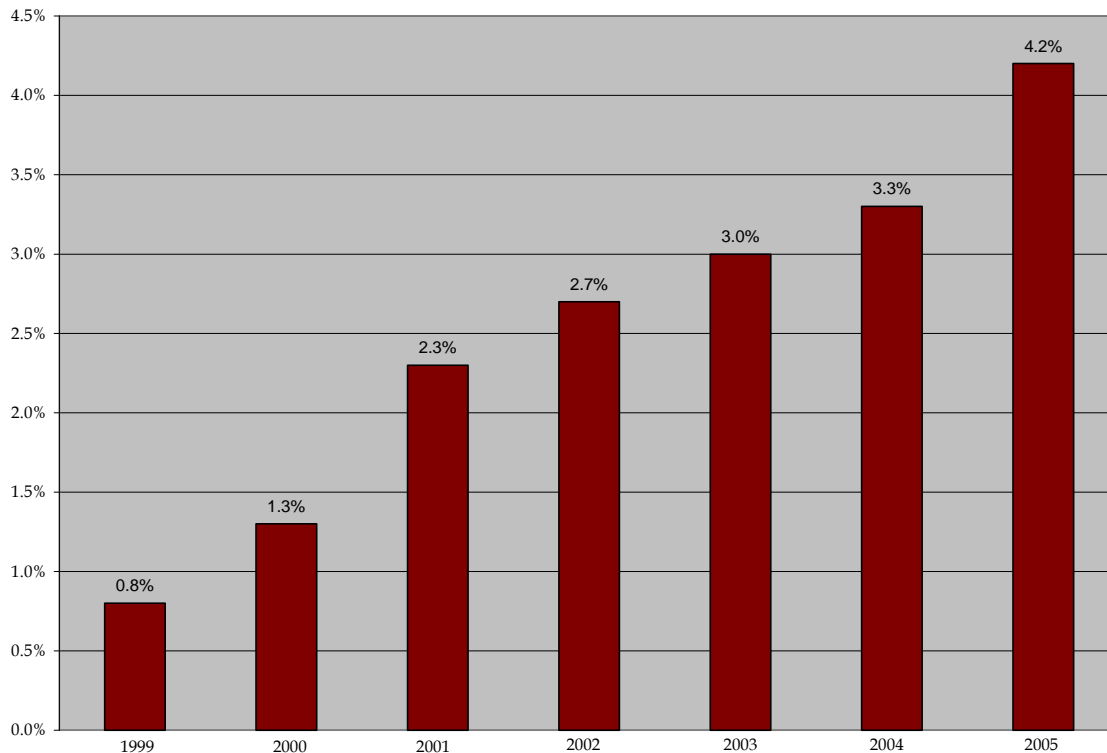


Source: Clean Edge

Venture capital investments in renewable energy have been growing as a percentage of all investments, which is indicative of investment in the industry and potential future growth (see Chart 3.6). In 2005, \$920 million was invested in the U.S. in renewable energy ventures.

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Chart 3.6
Renewable Energy Investments as a Portion of all Venture Capital Investments, 1999-2005



Source: Nth Power, LLC

High Plains Highway Corridor Region

The High Plains Corridor Counties are especially well-positioned with respect to

- Ethanol production
- Wind generation
- Biodiesel

Ethanol

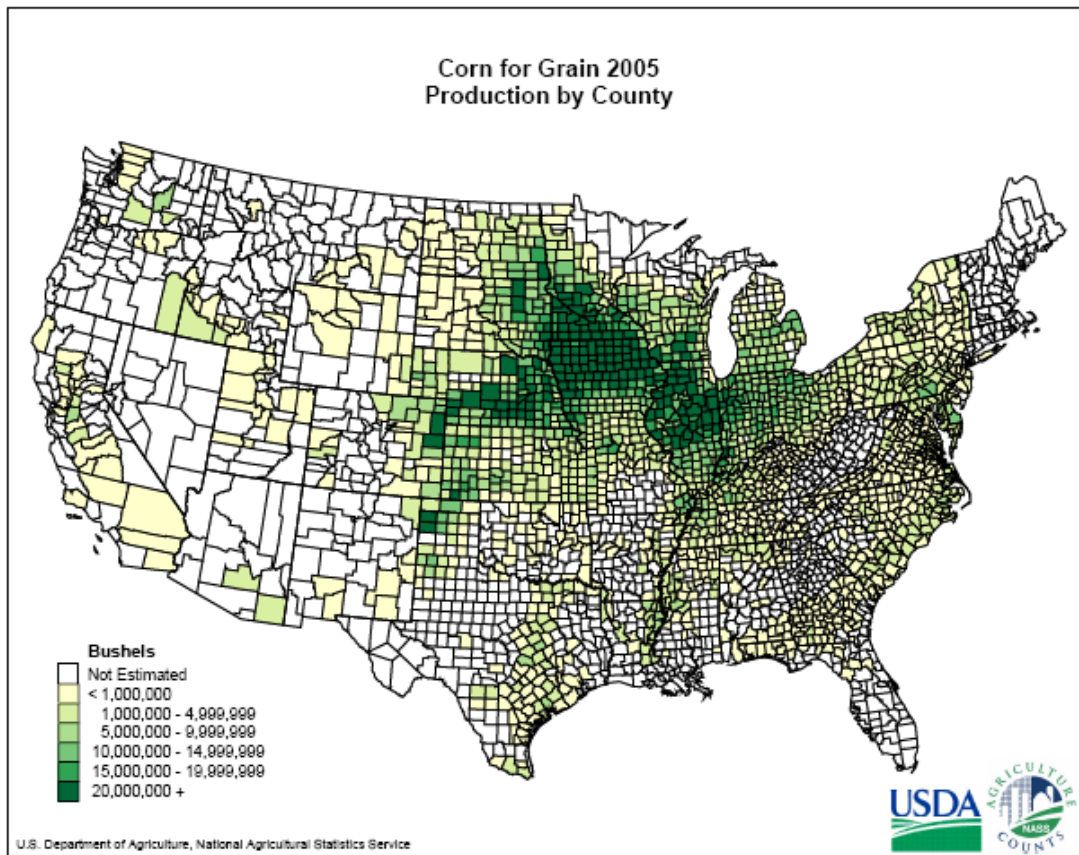
The High Plains Highway Corridor region is heavily involved in crop production. As the Figure 3.1 indicates, U.S. corn production is heavily concentrated in the Midwest; in Colorado, the majority of corn production is found in northeastern Colorado. Yuma County is one of Colorado's top producing corn counties.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

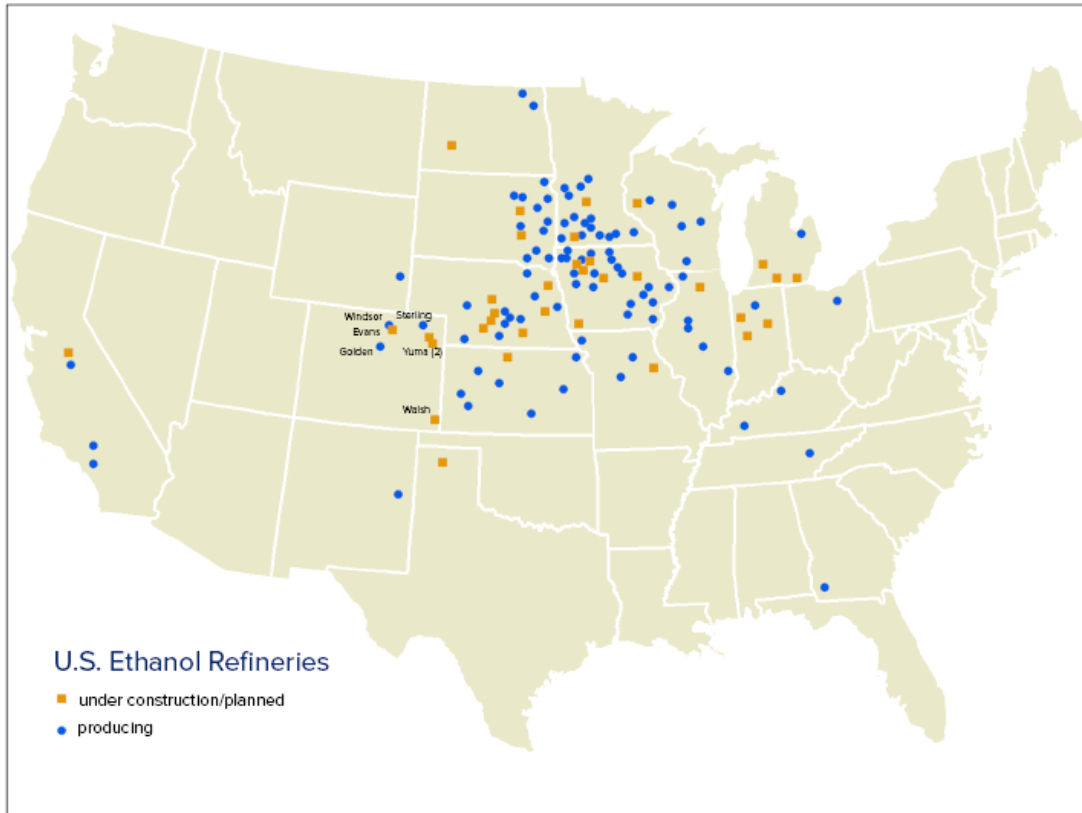
Figure 3.1
U.S. Corn Production, 2005



The majority of existing U.S. ethanol refineries are found in the Midwest. Growth in the industry is starting to take place outside of the traditional “corn belt” states including Colorado, Ohio, New Mexico, Texas, and California. In Colorado, production is occurring in Golden, Windsor, and Sterling. Figure 3.2 shows the distribution of refineries.

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Figure 3.2
U.S. Ethanol Production, 2006



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

The potential growth of the industry in the High Plains Highway Corridor region is demonstrated by current ethanol investment in the region. There is about \$200 million in direct investment in ethanol projects, primarily in Yuma County. They are as follows:

- A 50 million gallon facility east of the town of Yuma - Yuma Ethanol is investing \$61 million in a 50 million gallon ethanol manufacturing plant east of the town of Yuma. It is currently under construction estimated to be completed in June, 2007. They anticipate employing a peak construction workforce of 180 and a permanent staff of about 40 employees. The average wage is anticipated to be about approximately \$40,000. They anticipate doubling capacity soon after the plant opens in the summer of 2007.
- A 100 million gallon facility also east of the town of Yuma – Dallas-based Panda Energy is planning a \$120 million facility which would employ as many as 500 construction workers and a permanent staff of 60. This plant is expected to be completed in 2009.
- A potential demonstration plant by Fort Lupton-based Pure Vision Technology in Yuma County - The company is currently gauging the commercial feasibility of producing ethanol crop residue and waste materials known as “cellulosic” ethanol. The \$50 million plant would begin construction in 2010, and might be the first in the country, of its type.
- A possible ethanol plant to be sited in Phillips County with expected completion in the next two years. It is expected to result in 35-45 jobs. The facility will use rail as well as the local highway network to transport grain.

One potential local benefit from the demand on corn is the higher price it currently commands. Recent high demand for corn has pushed corn prices to \$4.50 a bushel compared with recent averages of \$2 to \$2.50 a bushel. High corn demand has caused recent worldwide shortages. High potential demand in Yuma County may require the importing of corn from surrounding communities.

While corn is a good source for ethanol, there may not be enough corn to accommodate the needs of the transportation fuel market. Significant research and development funding is currently focused on reducing the production cost of cellulosic ethanol which is twice as expensive as traditional ethanol to produce. Cellulosic ethanol breaks down cornstalks, stover, wheat straw or other biomass feedstock into sugars, which are then fermented and purified into ethanol.

Wind Generation

The High Plains area of Colorado has wind resources consistent with utility-scale production. There are a number of wind turbine farms that are scattered throughout the region. Recent investment includes the following:



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

- A \$1.6 million, 900 kilowatt wind turbine proposed by the Wray school district. Annual power generation is valued at \$50,000 to \$100,000.

The chief challenge has been necessary transmission lines for utility-scale production.

- The Eastern Plains Transmission project is a proposed new transmission project that would include about 1,000 miles of new high-voltage transmission lines and related facilities in eastern Colorado and western Kansas, expansions at existing substations and construction of new substations, access roads and fiber optic communication facilities. As it is currently planned, the project would be one of the largest transmission additions in the United States in the past five years. The project study area includes Cheyenne, Kit Carson, and Yuma Counties. The project is currently conducting environmental studies as well as negotiating easements for transmission lines.

Biodiesel

Biodiesel is a non-toxic, biodegradable diesel fuel made from soybean, other vegetable oils, animal fats, and used or recycled oils and fats. There were an estimated 75 million gallons of biodiesel used in the U.S. in 2005. According to the National Biodiesel board, the U.S. biodiesel industry is comprised of 65 manufacturing plants with an annual capacity of 395 million gallons per year. Eight plants are in the process of expanding and an additional 50 plants are under construction which could add another 715 million gallons of capacity. Local activity includes:

- American Agri-diesel in Burlington is working closely with the City of Burlington as the company operates and expands its business locally at Burlington's Industrial Park. The company provides fuel to several suppliers in the Colorado Springs area, and has a distribution bulk tank for local farmers. The firm also fuels equipment and vehicles for its parent company, Dwire Excavating.
- A \$14 million grain, fertilizer manufacturing and fuel mixing complex being developed east of Yuma by M&M Cooperative Inc., a local farmer's group. The co-op is also conducting a feasibility study at the site that would make diesel fuel from crop oils.
- Colorado State University (CSU) recently completed a feasibility study for a biodiesel blending facility in Phillips County. That study has been incorporated into the plans of a private biodiesel company which has recently purchased land and is planning construction. The company is working closely with Phillips County. Future plans include a crushing facility. The facility is expected to have impacts on US 385 and US 6.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Possibilities for growth exist in the region as sunflower, mustard, canolina are drought-tolerant and a rotational crop for wheat and millet. They are a good adaptation to dryland agriculture, an increase of which will result from the Republican River Basin Compact enforcement. The Compact will impact Kit Carson, Philips, Sedgwick, and Yuma counties, in addition to Lincoln, Logan, and Washington counties.

Governmental Activities and the Future

Renewable energy and investment in the industry is a politically unifying issue. A number of states have renewable portfolio standards that mandate a significant percentage (20-25 percent) of electricity come from renewable energy. Recent legislative actions include:

- In 2005, President Bush signed the Energy Policy Act of 2005 creating a National Renewable Fuels Standard. This establishes a baseline for renewable fuel use, beginning with 4 billion gallons per year in 2006 and expanding to 7.5 billion gallons by 2012.

Recently-elected Governor Ritter has announced that it is one of the current administration's goals to make Colorado a leader in renewable energy.

- Recently-passed legislation would require Xcel Energy to increase its renewable energy portfolio (to 20 percent from 10 percent by 2020)
- \$2 million in seed money was recently provided by the State to the newly-created Colorado Center for Biorefining and Biofuels (C2B2) to be used to obtain federal matching grants for research and development into new renewable energy technologies. C2B2 is a public-private partnership comprised of a number of private companies, the University of Colorado at Boulder, Colorado School of Mines, Colorado State University and the National Renewable Energy Laboratory in Golden.

Given recent activity, the High Plains Highway Corridor region is positioned to take advantage of this new emphasis on the development of renewable energy industries in the state. This industry promises to provide jobs and high salaries to the local economy, and be a substantial contributor to the state's economy as well as contributing to national security. Efficient and safe transportation facilities will help facilitate the growth of these industries and position the High Plains Highway Corridor region for other potential opportunities.

Freight Movement

The efficient movement of freight is critical to the economic well-being of the High Plains highway corridor communities. Much of the freight traffic in the High Plains Highway Corridor communities is composed of agricultural products as well as other general freight.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

As previously indicated, the two largest grain crops grown in the region include corn for grain and wheat. Corn production in the region in 2002 was approximately 62 million bushels, while wheat production was approximately 12 million bushels. It can be assumed that annual production since then has steadily increased.

Most of the wheat produced in Colorado is exported via rail car to ports in the Gulf of Mexico as well as in the Pacific Northwest. The remainder is moved to local flour mills via trucks.

Corn, particularly ethanol, production will have the highest potential impact on freight movement in the High Plains region. It is estimated that the two ethanol plants being constructed in Yuma alone will process an estimated 55 million bushels of corn each year. Current commitments aside, it was estimated that Yuma County, which is one of Colorado's top corn producing counties, produced about 40 million bushels in 2005, highlighting the potential need for imported corn.

Truck and rail will be the primary modes of transporting corn and other fuel sources to the plants as well as conveying products to their markets. As the plants are not yet operational, it is difficult to forecast both short and long term transportation impacts on the local street network and the highways. Conservatively assuming that half of the 15 million bushels needed for production would come by rail and the other half by truck (a five-axle truck carries approximately 900 bushels of corn), it would mean 23 additional loaded truck trips per day moving this additional freight.

3.4 ECONOMIC BENEFITS OF TRANSPORTATION INVESTMENT

As part of its analysis of the 2030 Statewide Transportation Plan, CDOT projected that it will need an additional investment of \$48 billion beyond current revenue projections to sustain current transportation system performance. Over the investment timeframe, a study commissioned by CDOT estimated that the economic benefits of this increased investment would amount to more than \$59.6 billion.

While the costs and benefits will fall somewhat unevenly throughout the state, the measures analyzed show how important investment in transportation infrastructure can be, not only to the quality of life, but to economic well-being. Table 3.11 summarizes these benefits.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Table 3.11
2030 Benefits of Increased Transportation Spending, State of Colorado**

Benefit	Annual Benefit to Colorado in 2030
Safety Improvements	<ul style="list-style-type: none"> ▪ 12,100 fewer accidents ▪ 4,300 fewer accidents involving injuries ▪ 140 lives saved ▪ \$0.5 billion in reduced economic losses
Reduced Congestion	<ul style="list-style-type: none"> ▪ 26 hours of time saved (per resident) ▪ 30 gallons of fuel saved (per resident) ▪ \$1.7 billion in travel time savings for households ▪ \$240 in travel time savings (per resident) ▪ \$0.6 billion savings for Colorado businesses
Better Pavement Quality	<ul style="list-style-type: none"> ▪ \$0.9 billion in reduced vehicle operating costs for households ▪ \$205 in savings per vehicle ▪ \$0.2 billion in savings for Colorado businesses
General Systems Improvements	<ul style="list-style-type: none"> ▪ 10,900 new long term jobs (\$0.7 billion in increased personal incomes) ▪ 28,000 construction-related jobs ▪ Increased economic competitiveness ▪ Improved access to health and human services ▪ Increased visitation to tourist destinations

Sources: CDOT, BBC Research and Consulting



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

In general, the economic benefits of highway improvements can be summarized as follows:

- Improved safety – includes reductions in accidents and fatalities, savings in medical care, insurance expenses, lost workplace productivity and personal property damage
- Shorter travel times – Less time spent in stop-and-go conditions reduces fuel consumption and helps increase productivity
- Reduced vehicle operating costs – Reduction of general wear and tear on vehicles results in lower vehicle repair, maintenance, insurance and depreciation costs
- Business expansion and attraction – the costs of doing business in Colorado would decrease, and the resulting increase in productivity would aid in the attraction and creation of more and better-paying jobs

Other considerations, particularly beneficial to the High Plains Highway Corridor region would include:

- Rural economic development – Improved quality of the highway and increased capacity on freight corridors would help promote economic development and improved farm-to-market commercial activities in the High Plains Corridor region
- Freight movement – Improved highway quality would also better enable the growth of industries in the region and the movement of goods to major markets
- Benefits to the tourism industry / access to recreation – Hunting, birding and other outdoor recreational activities are popular with tourists and residents. Improved and safer highway quality would help in accessing recreational areas, such as Bonny Recreational Area, Beecher Island Battleground, Burlington Old Town, Burlington Carousel, Pony Express Routes, Old Julesburg historic area, and Lake McConaughy near Ogallala, Nebraska.
- Higher quality of life – Residents and visitors would have safer travel as well as greater freedom with route choices and time of day when traveling
- Short-term construction benefits –there would be a number of short-term construction jobs created by the construction of transportation improvements. These jobs and their spending would help generate spin-off economic benefits in other industry sectors throughout local economies.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

4.0 PRIORITIZED PROJECTS

Tables 4.1 and 4.2 present this Plan's prioritized lists of projects for CDOT Regions 4 and 1, respectively. This list and prioritization represent a thorough evaluation of the entire corridor based on various data and intensive local input. The comprehensiveness of this list reflects the desire to fully consider the High Plains Highway Corridor's broad system function as a connection in flows of goods and services between southeastern Colorado and southwestern Nebraska, among the established agricultural communities, and emerging energy economies in the corridor.

Overall corridor improvement costs are significant. Funding levels must increase to accomplish any of the listed improvements, and must increase substantially to significantly address the full breadth of improvements listed, whether these are shoulders, intersection improvements, or other suggested improvements. Implementation commitments for specific segments require the local agencies in the corridor to use this Plan and list as a ready-made tool to advance projects within the Eastern TPR process, revisiting and redefining the projects in coordination with CDOT as funding scenarios evolve at both a statewide and local level. Therefore, the specific timing and scope of implementation will consider and be dependent upon both the overall rating and funding availability, such that in some cases lower priority projects might precede higher priority ones if the availability funding at a given point in time dictates this situation. Independent project development will occur within CDOT Regions 1 and 4.

The overall rating of each project is based on the community-defined Safety, Freight Mobility, Economic Development, Environmental, and Community Goals criteria, with emphasis on the safety, freight, and economic factors. The overall rating of each project is roughly synonymous with its safety rating, as all other criteria tended to rate equally for any given project. The primary factors in assessing safety were accident histories and proximity of potential projects to schools. The specific projects were also defined by the stakeholders, with the termini of the shoulder improvement projects being defined by location-specific projects (such as intersection or curve improvements), major structures, and significant changes in roadway terrain. Accordingly, the precise definition of the limits and nature of proposed improvements advanced into subsequent project development stages will likely evolve as the local agencies continue to work with CDOT towards implementation. Listed segments could be combined, while others could be divided into different sections for design, clearance, and construction. These definitions will be based on availability of funding, logical breaks between corridor elements, and in some cases could result in economies of scale in terms of construction costs.

The High Plains Highway Coalition, the nearby local agencies in Nebraska, NDOR, and CDOT will continue discussions regarding the feasibility and implementation of a re-designation of the US 385 in southwestern Nebraska, improvements to directional signing, and possible other improvements. Projects within Nebraska have not been listed and are dependent on both the



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

outcome of that discussion, as well as parallel local and statewide transportation planning processes in Nebraska.

Major bridge reconstruction (the Platte, Arikaree and Republican Rivers) as well as a series of minor projects such as signing and marking improvements, are acknowledged but not included in this list. Funding for major bridge replacement, reconstruction, and localized safety-oriented improvements typically comes from sources independent of those that are used to accomplish the types of capital-intensive projects included in this list.

Specific information regarding estimated costs and detailing the environmental surveys that support this evaluation are found in the appendices. Cost estimates assume standard widths for travel lanes and surfaced shoulders such that the assumed roadway cross section is essentially a “Super 2” type of facility.

Some key observations and assumptions that formed the basis of the evaluation include:

- Safety, freight mobility, and economic development were noted as the key criteria by the local agencies.
- The rating for the safety criteria for spot locations - intersections and curves – was as follows: a “full” circle was used if there were three accidents or more in the three-year period investigated, one or more accidents involving fatalities, or a school is in proximity to the project; a “half” circle was used with one or two accidents, and an open circle was used if no accidents had occurred in that period.
- The segment of US 385 south of I-76 for approximately 3.5 miles and between the pair of Yuma County Road FF intersections were noted as safety issues based on accident histories.
- The alternate truck route in Burlington and the realignment of US 385 in Cheyenne Wells were each rated favorably with respect to both freight mobility and improved travel time.
- The alternate truck route in Burlington rated favorably with respect to economic development due to providing improvements to accessibility for the expanding industrial park.
- In general, shoulder improvements and other projects given distinct preference from the local agencies were rated most favorably in terms of compatibility with community objectives.
- Projects that would address demonstrated safety issues were given the most favorable overall rating; the Burlington alternate truck route, drainage, and sidewalk improvements on the north side of Cheyenne Wells also were assigned high overall ratings due to positive evaluations in several categories.

**HIGH PLAINS HIGHWAY CORRIDOR
POTENTIAL IMPROVEMENT PROJECTS BY CDOT REGION**

TABLE 4.1 - REGION 4 PROJECTS

Project	Criteria									Overall Rating	Comments
	Project Length (in miles)	Improve Safety		Improve Freight Mobility	Supports Economic Development	Compatible with Community Objectives	Improves Travel Time	Compatible with Natural Environment	Cost (millions)		
		Rating	Comments								
Shoulder construction Nebraska border to SH 11	6.0	○		○	○	●	○	○	\$19.2	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations
Intersection & shoulder improvements at SH 11	0.8	○		○	○	○	○	●	\$3.8	○	
Julesburg drainage/intersection projects	1.0	○	2 accidents	○	○	○	○	●	\$6.5	○	
Shoulder construction: US 138 to Platte River	1.0	○		○	○	●	○	○	\$8.3	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; proximity of Platte River is a consideration with environmental clearance
Shoulder construction: Platte River to I-76	0.4	○		○	○	●	○	○	\$1.2	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; proximity to Platte River is a consideration with environmental clearance
Shoulder construction & passing lane: I-76 to Sedgwick CR 24	3.6	●	6 accidents	○	○	●	○	○	\$13.2	●	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at private driveways apx 1 mile south of I-76	0.8	○		○	○	○	○	●	\$3.8	○	
Shoulder construction: Sedgwick CR 24 to Sedgwick CR 45/curve	9.3	○		○	○	●	○	○	\$32.1		substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Sedgwick CR 45/curve	0.8	○		○	○	○	○	●	\$3.8	○	potential opportunity for roadside grading by local agency
Shoulder construction: Sedgwick CR 45/curve to Sedgwick CR 4/curve	2.2	○		○	○	●	○	○	\$6.9		substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Sedgwick CR 4/curve	1.1	●	3 accidents	○	○	○	○	●	\$5.6	●	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 44	1.0	○		○	○	○	○	●	\$4.6	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 42	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 40	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 38	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 36	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 34	1.0	○	1 accident	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 32	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 30	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 28	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 26	1.0	○	1 accident	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 24	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at SH 23	1.0	○	1 accident	○	○	○	○	○	\$5.3	○	potential opportunity for roadside grading by local agency; proximity to fairgrounds is a consideration with environmental clearances
Intersection & shoulder improvements at Phillips CR 20.5 (Johnson Street)	1.0	●	school access	○	○	○	○	●	\$5.3	●	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 20	1.0	○		○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 18	1.0	○	2 accidents	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 16	1.0	○	1 accident	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 14	1.0	○	2 accidents	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 12	1.0	○	2 accidents	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 10	1.0	○	3 accidents	○	○	○	○	●	\$5.3	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Phillips CR 8	1.0	○		○	○	○	○	●	\$4.6	○	potential opportunity for roadside grading by local agency
Shoulder construction: Phillips CR 8 to Phillips CR 5 (apx)	1.1	○		○	○	●	○	○	\$3.7	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Phillips CR 5 (apx)	0.8	○		○	○	○	○	●	\$3.8	○	potential interim safety projects (signs, advisory systems, pull-outs)
Shoulder construction: Phillips CR 5 (apx) to Yuma CR FF (north)+ Yuma CR 54	7.0	○		○	○	●	○	○	\$21.7	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Yuma CR FF (north)+ Yuma CR 54	0.8	○		○	○	○	○	●	\$3.8	○	potential interim safety projects (signs, advisory systems, pull-outs)
Shoulder construction: Yuma CR FF (north)+ Yuma CR 54 to Yuma CR FF (south)+ Yuma CR 48.5	4.8	●	9 accidents	○	○	●	○	○	\$14.7	●	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Yuma CR FF (south)+ Yuma CR 48.5	0.8	●	6 accidents	○	○	○	○	●	\$3.8	●	potential interim safety projects (signs, advisory systems, pull-outs)
Shoulder construction: Yuma CR FF (south)+ Yuma CR 48.5 to Yuma CR 44.5	3.9	○		○	○	●	○	○	\$12.2	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)

NOTES:
List does not include maintenance work or low cost projects such as signing or minor drainage improvements
All cost are estimated in year 2007 dollars.

Legend
● Strongly satisfies criteria
○ Partially satisfies criteria
○ Does not significantly satisfy criteria

**HIGH PLAINS HIGHWAY CORRIDOR
POTENTIAL IMPROVEMENT PROJECTS BY CDOT REGION**

TABLE 4.1 CONTD. - REGION 4 PROJECTS

Project	Criteria									Overall Rating	Comments
	Project Length (in miles)	Improve Safety		Improve Freight Mobility	Supports Economic Development	Compatible with Community Objectives	Improves Travel Time	Compatible with Natural Environment	Cost (millions)		
		Rating	Comments								
Intersection & shoulder improvements at Yuma CR 44.5	0.8	○		○	○	○	○	●	\$3.8	○	potential interim safety projects (signs, advisory systems, pull-outs)
Shoulder construction: Yuma CR 44.5 to Yuma CR 42/Bledsoe's Feedlot	2.2	○	3 accidents	○	○	●	○	○	\$6.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Yuma CR 42/Bledsoe's Feedlot	0.8	●	3 accidents	○	○	○	○	●	\$3.8	●	potential interim safety projects (signs, advisory systems, pull-outs)
Shoulder construction: Yuma CR 42/Bledsoe's Feedlot to Yuma CR 37	4.1	○		○	○	●	○	○	\$12.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Yuma CR 37+36	1.0	●	2 accidents (1 fatal)	○	○	○	○	○	\$4.6	●	potential interim safety projects (signs, advisory systems, pull-outs); proximity to drainageway is a consideration with environmental clearances
Intersection & shoulder improvements at Yuma CR 33.6	1.0	●	4 accidents	○	○	○	○	●	\$5.3	●	potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Yuma CR 33	1.0	●	3 accidents	○	○	○	○	●	\$4.6	●	potential opportunity for roadside grading by local agency
Shoulder construction: Yuma CR 33 to Yuma CR 30 (east)/curve	2.3	○		○	○	●	○	○	\$7.4	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Yuma CR 30 (east)/curve	1.0	○	1 accident	○	○	○	○	●	\$4.6	○	potential opportunity for roadside grading by local agency
Intersection & shoulder improvements at Yuma CR 30 (west)/curve	1.0	○		○	○	○	○	●	\$4.6	○	potential opportunity for roadside grading by local agency
Shoulder construction: Yuma CR 30 (west)/curve to Yuma CR 24	5.5	○		○	○	●	○	○	\$17.0	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
Shoulder construction: Yuma CR 24 to US 36 (north)	12.0	○	12 accidents	○	○	●	○	○	\$101.6	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at US 36 (north)	0.8	●	2 accidents (1 fatal)	○	○	○	○	●	\$3.8	●	
Shoulder construction: US 36 North to US 36 (south)	1.8	○		○	○	●	○	○	\$5.6	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations
Intersection & shoulder improvements at US 36 (south)	0.8	○		○	○	○	○	●	\$3.8	○	
Shoulder construction: US 36 (south) to Yuma CR 7	1.8	○		○	○	●	○	○	\$5.8	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations
Intersection & shoulder improvements at Yuma CR 7	0.8	○	2 accidents	○	○	○	○	●	\$3.8	○	
Shoulder construction: Yuma CR 7 to Yuma CR 3	3.5	○	7 accidents	○	○	●	○	○	\$27.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
Intersection & shoulder improvements at Yuma CR 3	1.0	○	2 accidents	○	○	○	○	○	\$4.6	○	proximity to Bonny State Park is a consideration with environmental clearances
Republican River channel improvements	-----	○		○	○	○	○	○	-----		improvement responsibilities and options being examined
Intersection & shoulder improvements at Yuma CR 2	1.0	○	1 accident	○	○	○	○	●	\$4.6	○	proximity to Bonny State Park is a consideration with environmental clearances
Shoulder construction: Yuma CR 2 to Yuma-Kit Carson County Line	1.8	○	4 accidents	○	○	●	○	○	\$18.7	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
									Region 4 Total:	\$528.4	

NOTES:
List does not include maintenance work or low cost projects such as signing or minor drainage improvements
All cost are estimated in year 2007 dollars.

Legend
● Strongly satisfies criteria
○ Partially satisfies criteria
○ Does not significantly satisfy criteria

**HIGH PLAINS HIGHWAY CORRIDOR
POTENTIAL IMPROVEMENT PROJECTS BY CDOT REGION**

TABLE 4.2 - REGION 1 PROJECTS

	Projects	Project Length (in miles)	Criteria								Overall Rating	Comments
			Improve Safety		Improve Freight Mobility	Supports Economic Development	Compatible with Community Objectives	Improves Travel Time	Compatible with Natural Environment	Cost (millions)		
			Rating	Comments								
US 385	Shoulder construction: Yuma-Kit Carson County Line to Kit Carson CR 48.6	3.4	○		○	○	●	○	○	\$27.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential interim safety projects (signs, advisory systems, pull-outs)
	Shoulder construction: Kit Carson CR 48.6 to Kit Carson CR Z	11.3	○		○	○	●	○	○	\$36.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Shoulder construction: Kit Carson CR Z to Kit Carson CR W	2.2	○	3 accidents	○	○	●	○	○	\$9.3	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Burlington truck alternate	4.0	○		●	●	●	●	to be determined	\$11.6	●	potential opportunity for roadside grading by local agency; supports economic and community objectives; improves freight mobility; potential benefits to corridor travel time
	Lincoln Avenue 2-way left turn lane	0.3	○		○	○	●	○	●	\$4.0	○	potential benefits to corridor travel time
	Shoulder construction I-70 to Kit Carson CR S	3.0	○		○	○	●	○	○	\$9.4	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Kit Carson CR S	1.0	○	1 accident	○	○	○	○	●	\$4.6	○	potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Kit Carson County Airport intersection	1.0	○		○	○	○	○	●	\$4.6	○	potential opportunity for roadside grading by local agency
	Shoulder construction: Kit Carson County Airport intersection to Cheyenne CR DD/48/curve	15.9	○		○	○	●	○	○	\$51.8	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Cheyenne CR DD/48/curve	0.8	○		○	○	○	○	●	\$3.8	○	potential opportunity for roadside grading by local agency
	Shoulder construction: Cheyenne CR DD/48/curve to Cheyenne CR DD/44/curve	3.3	○	5 accidents	○	○	●	○	○	\$10.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Cheyenne CR DD/44/curve	0.8	○		○	○	○	○	●	\$3.8	○	potential opportunity for roadside grading by local agency
	Shoulder construction: Cheyenne CR DD/44/curve to Cheyenne CR Z	3.1	○		○	○	●	○	○	\$9.7	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Cheyenne CR Z	0.8	○		○	○	○	○	○	\$3.8	○	potential opportunity for roadside grading by local agency; proximity to drainageway is a consideration with environmental clearances
	Shoulder construction: Cheyenne CR Z to Cheyenne CR W	3.1	○		○	○	●	○	○	\$9.7	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency; proximity to drainageway is a consideration with environmental clearances
	Intersection & shoulder improvements at Cheyenne CR W	0.8	○		○	○	○	○	○	\$3.8	○	potential opportunity for roadside grading by local agency
	Shoulder construction: Cheyenne CR W to Cheyenne CR T	3.1	○		○	○	●	○	○	\$9.7	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Cheyenne CR T	0.8	○		○	○	○	○	●	\$3.8	○	potential opportunity for roadside grading by local agency
	Shoulder construction: Cheyenne CR T to Cheyenne CR R	2.2	○		○	○	●	○	○	\$8.2	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Cheyenne Wells - new connection to US 385 with relocation of at-grade RR crossing	0.2	○		●	○	●	●	to be determined	\$5.0	●	improves freight mobility and corridor travel time; supports economic and community objectives
Cheyenne Wells - drainage & sidewalk improvements	0.3	●	proximate to school	○	○	●	○	●	\$1.0	●		
US 40	Intersection & shoulder improvements: Cheyenne CR 42 to US 385/US 40 junction (west)	2.5	●	3 accidents	○	○	●	○	○	\$10.2	●	substantial lengths of shoulder construction will likely have some environmental clearance considerations; proximity of park & fairgrounds are considerations with environmental clearances
	Shoulder construction: Cheyenne CR 34 to Cheyenne CR 42	7.8	○		○	○	●	○	○	\$24.3	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Cheyenne CR 34	0.8	○	2 accidents	○	○	○	○	●	\$3.8	○	potential opportunity for roadside grading by local agency
	Shoulder construction: Cheyenne CR 31 to Cheyenne CR 34	2.2	○		○	○	●	○	○	\$6.9	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency
	Intersection & shoulder improvements at Cheyenne CR 31	0.8	○	1 accident	○	○	○	○	●	\$3.8	○	potential opportunity for roadside grading by local agency
Shoulder construction: Kit Carson to Cheyenne CR 31	9.3	○		○	○	●	○	○	\$31.6	○	substantial lengths of shoulder construction will likely have some environmental clearance considerations; potential opportunity for roadside grading by local agency	

NOTES:
List does not include maintenance work or low cost projects such as signing or minor drainage improvements
All cost are estimated in year 2007 dollars.

Legend
● Strongly satisfies criteria
○ Partially satisfies criteria
○ Does not significantly satisfy criteria

Region 1 Total:	\$313.9
Regions 1 + 4:	\$842.3

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

5.0 IMPLEMENTATION – PARTNERSHIP & FUNDING CONSIDERATIONS

The estimated overall corridor improvement costs are significant, well exceeding the funding that could reasonably be expected within the foreseeable future. Further, current state transportation funding levels will need to increase before projects can be constructed along the corridor. This disparity between funding and needs actually amplifies the value of both the detailed level of the specific recommendations of this Plan and the broad support demonstrated during its creation. The Plan's specificity will allow responsiveness and flexibility on the part of CDOT in making improvements listed here over a long-range span, adapting to cyclical economic and funding conditions at the national, state, regional, and local levels. The funding/needs disparity also emphasizes the need to identify funded sources that can be applied to a range of large and relatively localized projects. This section of this document describes issues, processes, and the range of funding services to be considered as CDOT and the local agencies work collectively to improve the corridor.

This Plan was developed with broad agency support and includes commitments by the High Plains Highway Coalition, the local agencies, and CDOT to consider partnering opportunities, such as the facilitation of shoulder improvements on a case-by-case basis. Accordingly, the likelihood of prioritized improvements and opportunities for funding will be enhanced when any additional revenues do become available. The importance of both developing a plan and maintaining local support cannot be overstated. This Plan will serve as:

- The Coalition's tool to vie for funding in the statewide project prioritization and funding process
- The Coalition's best opportunity to obtain funding for corridor projects
- A means to allow the local agencies to continue, over time, to monitor and revisit corridor conditions; modify the Plan as appropriate; and maintain support for corridor projects through future CDOT planning and funding cycles.

5.1 POTENTIAL PARTNERSHIPS

It is significant that several of the local agencies within the Coalition expressed an interest in partnering with CDOT to make improvements to roadside grading, provide and/or transport paving and embankment materials, and/or acquire right-of-way to prepare for eventual shoulder construction. This partnering approach is another attribute of the broad, ongoing support that can lend to this plan's successful implementation. The agencies were briefed on the need to maximize durability and effectiveness of these projects and to account for state and federal requirements and considerations regarding engineering, safety and funding eligibility and viability, especially at a Federal level. The benefits of leveraging certain aspects



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

of jointly-conducted projects (such as traffic control and erosion control) were also explained to the local agencies.

Local agencies understand that they may participate in such improvements by accounting for these requirements and considerations. CDOT supports the partnership approach and will facilitate this process on a case-by-case basis, by coordinating any future resurfacing and construction projects with the prioritized list of projects, offering permitting assistance to local agencies, and being vigilant for creative partnering opportunities.

Some key technical messages that were conveyed to the stakeholders in considering partnering opportunities include:

- Specific soil types are needed for shoulder and roadway embankment; material must be uniform and consistent.
- The phases of project development and the need for each phase were explained.

Project pre-planning activities include:

- utilities identification and relocation;
- environmental analysis and identification of any potentially impacted resources of concern including threatened and endangered species, hazardous materials research, wetlands and riparian areas, and others;
- right-of-way survey;
- right-of-way acquisition (permanent or temporary easements, where appropriate) in conformance with the procedures of the Uniform Relocation Assistance and Real Property Acquisition Policy Act (Uniform Act);
- hydrologic studies to ensure proper drainage within the right-of-way;
- structure identification and assessment (rehabilitation, extension, replacement)
- permit requirements from other agencies including the Colorado Department of Public Health and Environment for erosion control, dust mitigation, and waterway protection (storm water permits), and the US Army Corps of Engineers for the protection of wetlands and riparian habitat; and
- utility and environmental clearances must be processed prior to initiating right-of-way acquisition.
- project design that meets CDOT/FHWA specifications design and requirements

Construction Preparation:

- traffic control and detours; and
- erosion control, vegetation removal, and surveying.

Construction:

- lift placement;
- moisture content ;
- compaction techniques;
- final grading;
- top soil preparation;



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

- mulch and seeding.
- Post Construction:
- inspection and maintenance of erosion control devices at least every 30 days until permit deactivation; and
 - vegetation coverage before permits closure; these permits can be in place for 2 or more years.

5.2 FUNDING CONSIDERATION AND OPTIONS

The financing of highway projects in Colorado, as well as the rest of the nation, is being significantly affected by the inability of traditional funding sources and methods to keep pace with the need for new highway capacity and the maintenance of existing infrastructure. Referendum C passed in 2005 by Colorado's voters only partially addresses this concern. It sets aside the inflation-based TABOR¹ formula and allows the State to spend or save all the revenue it collects for five years (2006-2010) estimated at over \$3.5 billion. Transportation was forecasted to receive over \$200 million in additional revenues in fiscal year 2005-2006. Part of this revenue retained by this change would pay for projects included in CDOT's strategic transportation project investment program.

Even with the infusion of additional revenues, there is still a funding shortfall. CDOT categorizes its budget into seven general groups. These include strategic projects, system quality, mobility, safety, program delivery, earmarks and those designated as part of a regional priority program. Table 5.1 shows the budgets for these groups. Currently, most of the expected improvements in the High Plains corridor region would likely fall under CDOT's Regional Priority Projects category for Region 1 and Region 4. In CDOT's current draft budget for years 2008-2035, \$43 million would be potentially available for projects in Region 1 outside of the Denver Regional Council of Governments (DRCOG) allocation. In Region 4, 17 percent of the \$100 million is allocated to DRCOG and 21 percent to the North Front Range Metropolitan Planning Organization, leaving \$62 million for other Region 4 projects.

1. ¹TABOR (Taxpayer's Bill of Rights) was adopted in 1992 to limit revenue growth for state and local governments. It includes the requirement that any tax increase must be approved by the voters of the affected jurisdiction.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Table 5.1
CDOT 2008-2035 Plan Control Totals**

	Region 1 (\$millions)	Region 4 (\$millions)	Total (\$millions)
Strategic Projects	\$1,495	\$856	\$2,351
System Quality	\$1,166	\$1,391	\$2,557
Mobility	\$578	\$333	\$911
Safety	\$436	\$386	\$822
Program Delivery	\$173	\$150	\$323
Earmarks	\$8	\$14	\$22
Regional Priority Program	\$96	\$100	\$196
Total CDOT Budget	\$3,952	\$3,230	\$7,182

Source: CDOT, Draft budget dated October 18, 2006

Counties, towns, and cities in the High Plains Highway Corridor Region participate in the CDOT decision-making process at the regional level through the Eastern Transportation Planning Region (Eastern TPR). The TPRs help establish funding priorities for construction and work with CDOT to establish the long-range transportation plan and Transportation Improvement Program (TIP). The priorities established in the High Plains Highway Corridor Plan are incorporated into the Eastern TPRs decision-making planning process.

In addition to participating in the CDOT planning process, jurisdictions have access to other smaller sources of funding for specific improvements. Tables 5.2 through 5.8 summarize these programs and resources. The CDOT regional offices are the main points of contact for additional information, unless otherwise noted.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 5.2
CDOT Programs

Program Name	Description
Enhancement Program	Funded by 10 percent set aside from the STP program or a state's funding level. It provides resources to fund 12 categories of cultural, aesthetic and environmental projects. Examples are bicycle and pedestrian facilities, scenic or historic highway programs, and landscaping.
Off-System Bridge Replacement Program	The Off-System Bridge Replacement Program is administered in cooperation with the county, Municipal League and CO. Counties Inc. It is an 80% grant with a 20% local match. Notices to municipalities and counties mailed annually with about \$5 million available.
Hazard Elimination Program: http://www.cotrip.org/its/whitepapers/architecture/FEDHAZ_2007_2009_Application_Form.pdf	CDOT regions, MPOs, Colorado Counties Inc. and the Colorado Municipal League solicit applications for this program. The minimum criteria for inclusion include a minimum of 7 total accidents or 3 fatal accidents within a three-year study period. Projects are funded based on the Benefit / Cost priority equations (as outlined in the application) in priority order to the extent funds are available.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Program Name

Description

Rail-Highway Crossing Program: also known as Section 130 program
http://www.dot.state.co.us/Traffic_Manuals_Guidelines/HSIP_2002/HSIP_20020805.pdf

Annual program funds available total approximately \$2.3 million with half of the allocated funds to be used for grade crossing protection devices. The CDOT Safety and Traffic Engineering Branch, the regional offices, MPOs and Colorado Counties Inc. solicit applications for off-system grade crossing improvements from local authorities. Project cost estimates (submitted by CDOT regions and locals) are sent to the State Public Utilities Commission (PUC). Each location is evaluated and ranked so that the location with the most potential to reduce accidents for the cost is funded first. Projects are funded by this ranking method until funding is exhausted.

Safe Routes to School Program:
www.dot.state.co.us/bikeped/

Contact: Safe Routes To School Coordinator:
Lenora Bates
lenora.bates@dot.state.co.us
(303) 757-9088

The Safe Routes to School Program, funded through SAFETEA-LU, is focused on enabling and encouraging children to safely walk and bicycle to school. Projects include sidewalk improvements, traffic calming, pedestrian, and bicycle crossing improvements, and traffic diversion near schools. The Program is 100% federally funded and managed through CDOT. Grants are awarded through a statewide competitive process, and in proportion to the geographic distribution of the student population in K-8 grades. 10 to 30% of the funds are dedicated to non-infrastructure (education and encouragement projects). Past minimum project funding has been \$50,000 and a maximum of \$250,000 with a total of about \$1 million to distribute statewide.

Source: CDOT



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

The Colorado Public Utilities Commission also has a Highway Crossing Protection fund which complements CDOT's Rail-Highway Crossing program:

Table 5.3
Colorado Public Utilities Commission

Program Name	Description
Highway Crossing Protection Fund http://www.dora.state.co.us/puc/rail/RailRules.htm http://www.dora.state.co.us/puc/notices/RailApsFiled/RailApsFiled.htm <i>Contact: CPUC Chief of Rail/Transit Safety, Pam Fischhaber, PE</i> <i>pamela.fischhaber@dora.state.co.us</i> <i>(303) 894-2529</i>	Funds are available on a first come/first served basis, and in the past, have been awarded up to \$240,000 / year. The PUC fund contributes approximately 70% of the cost of active warning devices. The railroads are expected to pay a minimum of 20%, and the roadway authority is expected to contribute at least 10%.

Source: CPUC

There are a number of borrowing programs currently in place which may be considered in the long term, particularly if there are future appropriations for the High Plains Highway Corridor. These provide local jurisdictions and/or other organizations the means to leverage future grants in order to pay for currently needed capital improvements. Table 5.4 summarizes these borrowing programs.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 5.4
Borrowing Programs

Program Name	Description
State Infrastructure Bank (SIB) <i>Contact: CDOT, Office of Financial Management & Budget (303) 757-9262.</i>	Revolving loan fund for local governments and/or private developers to provide capital for planning for construction of highway facilities at lower than market rate. Projects must be a qualified project, which includes projects authorized by the commission, right-of-way acquisitions, maintenance and safety projects.
Grant Anticipation Revenue Vehicles – (Garvees)	Capitalizes future grants for the construction of current infrastructure. Used in Colorado to help construct the T-REX project.
Private Activity Bonds	Allows states or local governments to issue tax-exempt, private activity bonds to finance the activities of “private” highway projects and rail-truck transfer facilities.
Transportation Infrastructure and Finance and Innovation Act (TIFIA)	Provides federal credit assistance to any major highway, transit or rail project (generally meets a \$50 million threshold) through secured loans, loan guarantees, and lines of credit.

Source: CDOT

Local jurisdictions also have some fund-raising tools available to them to help raise funds, typically for local street network and infrastructure, which complement CDOT’s work on the state highway system. Some of the tools and mechanisms through which this can be accomplished are listed in Table 5.5.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Table 5.5
Taxing Tools / Mechanisms Available to Local Jurisdictions**

Program Name	Description
Property Taxes	Needs voter approval to raise taxes; specific portion of the property taxes can be used for transportation capital improvements / maintenance
Sales / Use Taxes	Needs voter approval; projected future revenues can also be used to back bonds
Impact Fees	Typically imposed upon new developments to help pay for improvements in the area; need to establish legal relationship between fee and improvement
Employment (head) Tax	Needs voter approval; available to home rule cities only; others need enabling legislation
Motor Vehicle Tax	Needs voter approval
Metropolitan Districts	Formed by property owners within a proposed district. Can be used to finance infrastructure. Paid back through property taxes, fees
Special Districts	Either initiated by property owners or local jurisdictions. Can issue bonds for improvements to be paid back through property tax revenues, toll charges, special assessments, or sales taxes.
Rural Transportation Authorities	A separate governmental entity empowered to finance, construct, operate and maintain a rural transportation system. Needs voter approval for creation of Authority as well as creation of funding mechanism. Created by two or more governmental entities and can cross jurisdictional boundaries.

Source: DOLA

Other Related Governmental Programs

There are a number of federal and state programs targeted at rural economic development that can assist communities with business development, help fund local access projects, or provide technical assistance. While they do not directly fund transportation facilities, the programs can be used to complement highway improvements elsewhere. Some funds can be used for infrastructure planning and provisions for specific projects.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 5.6
US Department of Agriculture

Program Name	Description
Community Facilities Program	USDA Rural Development provides grants, direct loans and loan guarantees for critical community facilities. Program used recently to fund new construction of hospital in Yuma as well as a fire truck for the Holyoke Fire Protection District
Rural Development Business Programs	USDA has a number of loan and grant programs for rural business and economic development. Several of their programs focus on alternative energy development and can be used for planning and feasibility studies in these areas. Their Biobased Products and Bioenergy program finances technologies needed to convert biomass into biobased products and bioenergy.
Rural Business Cooperative Service	Limited funding available to private, non-profit organizations to provide technical support for rural passenger transportation improvements

Source: USDA

Table 5.7
Economic Development Administration

Program Name	Description
Economic Development Administration (EDA) Planning / Technical Assistance Programs http://www.eda.gov/InvestmentsGrants/Application.xml <i>Contact: Local EDA Office 303-844-4902</i>	There is economic development funding for planning / technical assistance, as well as potential funding to create a regional economic development strategy in this area of Colorado. EDA has the potential to fund regional Economic Development groups (i.e. annual grant of \$50K). The local match is 50%. That match can be met locally, and through state programs such as the Community Development Block Grant (CDBG) and/or Department of Local Affairs (DOLA). Historically, there has been funding for planning / technical assistance, preparation of regional economic development strategies, as well as ongoing funding of economic development groups. Typical grants are anywhere from \$50-\$75,000.

Source: EDA



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

**Table 5.8
Colorado State Resources**

Program Name	Description
Colorado State Office of Economic Development (OED)	Provides economic development technical assistance, accesses loans and grants and coordinates local economic development activities. OED also helps access economic development funds through the CDBG (community development block grant) program which help pay for infrastructure in rural communities or provide low-interest loans.
Colorado Energy & Mineral Assistance Fund	Assists communities affected by the growth and decline of energy and mineral industries, administered by the Department of Local Affairs (DOLA). Planning, construction and maintenance of public roads and streets are eligible activities. Grants and low interest loans up to \$300,000 are provided.
Colorado Agricultural Value-Added Development Fund	Financial and technical assistance offered to facilitate the processing of agricultural products within Colorado. Grants, tax credits, and the extension of credit are offered. Some transportation improvements may be eligible for inclusion in the program.

Source: State of Colorado



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

6.0 SIGNING IMPROVEMENTS AND INTELLIGENT TRANSPORTATION SYSTEMS

This section recommends general improvements to signing along the corridor, and examines the current and potential use of Intelligent Transportation Systems (ITS) along the High Plains Highway Corridor. ITS, as defined by the U.S. Department of Transportation (USDOT), is the improvement of transportation safety and mobility along with enhanced productivity through the use of advanced communications technologies. Traditionally, the deployment of ITS has been centralized around major metropolitan areas where recurring and non-recurring traffic congestion is significant. Some of the same ITS applications used in urban areas have comparable rural applications while other ITS services have been developed specifically for rural needs.

The need and potential for ITS applications in rural areas is significant. Incident and road condition detection, notification, and response in rural areas are complicated by the typically limited telecommunications systems that inhibit cell phone usage, and reduce or restrict the deployment of call boxes and other devices. Depending on the cellular service provider, there appears to be small cellular coverage gaps along the corridor between Cheyenne Wells and Burlington, Idalia and Wray, and Wray and Holyoke.

Along the High Plains Highway Corridor, several low-cost ITS applications are well suited to address the corridor's combination of physical conditions; wide, heavy, and slow-moving vehicles; wildlife and weather.

6.1 OPERATIONAL IMPROVEMENTS

Based on a review of the accident histories in the corridor, the following recommendations are made:

- Region 1 and Region 4 should undertake sight-specific reviews of accident locations to determine if additional or modified signing and/or pavement marking treatments can be applied to improve safety and operations in advance of construction of capital intensive projects. Examples of locations warranting specific attention include school areas (e.g. a marked and signed right-turn lane on U.S. 385 northbound at Johnson Street in Holyoke; a marked and signed left turn lane north bound at 8th Street in Wray), locations with a history of vehicle-wildlife collisions, and curves along the corridor other than the 90-degree turns at the section corners.
- Impact attenuation and/or other warning devices on the island near the 8th Street/U.S. 385 intersection in Wray should be considered.
- Additional trailblazing signs to more clearly identify U.S. 385 for travelers to and from Nebraska in the Deuel County area, especially to and from I-80 should be considered.
- Development and placement of corridor identification signs should be considered.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

6.2 EXISTING ITS INVENTORY

The bulk of the nearby existing ITS devices are located on east-west routes adjacent to the corridor, including I-70, I-76, U.S. 6, U.S. 36 and U.S. 40. All of the devices are utilized for travel and traffic management purposes whereby the specific field data and information on road network conditions, incidents and weather are collected and disseminated in real-time to motorists both pre-trip via radio, TV, phone, and the Internet and en-route by highway advisory radio, dynamic message signs, radio stations, and cellular phones.

The existing ITS field device types and locations are as follows:

Closed-Circuit Television (CCTV) Cameras

- I-70 at Burlington



CCTV cameras are dedicated for remotely viewing real-time highway conditions. Where the communication bandwidth is not sufficient to support full-motion video transmission, either freeze frame video or video snapshot methodologies can be employed to reduce the bandwidth demand. The CCTV camera in Burlington at I-70 has not yet been added to the www.cotrip.org website for access by the traveling public.

Highway Advisory Radio (HAR)

- I-76 at Julesburg

HAR is essentially a small, low powered radio station that is dedicated for providing traveler information to motorists while en-route. Its broadcast range varies from one to six miles and the majority of HAR systems use the AM band. HAR broadcasts are useful for conveying information to motorists about detours, operating restrictions such as requirements to put on chains, traffic conditions along short segments of specific routes, warnings about hazards (e.g., fires, floods, highway closures, etc.) and construction/maintenance work zones.

The Julesburg HAR at I-76 operates at 530 AM. In addition to the CDOT HAR, static signs along the U.S. 385 corridor between Burlington and Cheyenne Wells advises motorists to tune their radios to 1140 AM or 104.1 FM for local traffic and weather updates.

HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Dynamic Message Signs (DMS)

- Westbound (WB) I-70 at Burlington (overhead)
- Eastbound (EB) U.S. 40 at Kit Carson (roadside)
- WB U.S. 40 at Kit Carson (roadside)

DMS give motorists vital information while they are en-route and traveling at highway speeds. Messages are brief so that they can convey information quickly, thus allowing the motorist to make a decision and react. DMS can be fixed or portable and are typically located in advance of bridges, interchanges, tunnels and toll plazas. DMS displays are useful for conveying information about non-recurring events (e.g., construction, lane/highway closures, detours), about roadside facilities (e.g., rest areas), traffic management operations (e.g., climbing lanes, steep grade warnings, truck escape ramps, wildlife areas) and weather events (e.g., fog, rain, snow, sleet, hail, storms, floods).

Road Weather Information Systems (RWIS)

- WB I-76 at Julesburg (includes CCTV camera)
- Southbound (SB) U.S. 385 south of U.S. 6 in Holyoke
- Northbound (NB) U.S. 385 at U.S. 36 (east leg) near Idalia (includes CCTV camera)
- U.S. 40 at First View (between Kit Carson and Cheyenne Wells)
- U.S. 385 at the Republican River (roadway warning system for flooding)

RWIS is a meteorological station strategically placed alongside the highway to collect real-time local roadway and weather conditions. This allows CDOT to make informed decisions associated with precipitation, wind and winter storms. RWIS consists of specialized equipment and computer software to monitor precipitation amounts, precipitation on roadway, air and pavement temperatures and wind speed and direction. Optional equipment can also include items such as floats or pressure transducers to assess flooding concerns associated with bridges over streams and rivers, cameras to view actual conditions at each RWIS location (see U.S. 385 camera view from I-76 Julesburg RWIS) and fog detection systems. This information can be accessed by a central statewide transportation management center (TMC), local TMCs, automated to post pre-selected messages on adjacent VMS when specific data thresholds are reached, or a combination thereof.



The roadway warning system for flooding over the Republican River Bridge is believed to have been installed in 2002. A sensor monitors the low water area adjacent to the bridge to determine when motorists need to be warned or the road closed. Motorists on U.S.

HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

385 are automatically warned of possible water on the roadway through flashing LED lights and changeable street signs. If the danger continues to a higher level, the signs change to “Do Not Enter – High Water”. When the water recedes, the road is opened again and when the water has lowered to the point where it no longer is on the bridge, the system automatically shuts off. CDOT-Region 1 maintenance personnel have indicated that they have received some false calls from the system, but this could be due to the number of floats deployed, the condition of the floats, the heavy silting in the Republican River and resulting overgrowth of vegetation throughout the river.

6.3 RECOMMENDATIONS FROM OTHER PLANNING EFFORTS

The *CDOT Region 4 ITS Architecture* document made no specific recommendations for the eastern plains, but identified the following market packages as defined by the National ITS Architecture, which provides a common framework for planning, defining, and integrating ITS:

- Advanced Traveler Information Systems
- Advanced Public Transportation Systems
- Emergency Management
- Maintenance and Construction Management
- Commercial Vehicle Operations

The *Strategic Plan for Southeastern Colorado ITS* encompasses CDOT Regions 1 and 2. The plan identifies the following characteristics of southeast Colorado:

- The region is predominantly rural plains with few state highways and major roads. Secondary roads tend to only support low speed travel.
- Long distances separate many destinations with few services in between, and little power or communications infrastructure.
- There are few alternate or detour routes available.
- Long-haul trucking represents a large percentage of travel on many routes.
- Wildlife abounds, including several large animal species, such as antelopes and deer.

During the development of the Strategic Plan for Southeastern Colorado ITS, transportation issues and needs that could potentially be addressed by ITS were identified through a series of stakeholder workshops, incident management plan reviews, the regional transportation plans for each of the transportation planning regions in the project area and other transportation plans.

- Weather-related closures on the eastern plains disrupt travel.
- Limited law enforcement invites excessive speed and other safety infractions.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

- Long distances, limited route choices and geographic constraints impede emergency response in rural areas.
- Collisions with wildlife are a significant safety issue endangering lives and damaging wildlife populations.
- Natural or manmade emergencies occur suddenly and without warning, disrupting the transportation system and leading to delay, inconvenience and economic impacts.
- Maintenance of ITS devices is a critical issue. As ITS becomes more common, the public relies on it more; therefore downtime due to maintenance and repair becomes even more disruptive. Furthermore, by their very nature, the electronics required for ITS have greater ownership and maintenance costs as a percentage of construction than typical roadways and bridges.
- Electrical power and communications infrastructure are very limited in the rural portions of the eastern plains.

Seven core ITS services were identified to address regional issues and needs. These are:

- Incident management
- Traveler information
- Freeway traffic management
- Arterial traffic management
- Transit management and multi-modal coordination
- Safety management
- Communications and connectivity

The strategic objectives recommended for the eastern plains include:

- Implementing a road closure system on major state highways
- Providing rural traveler information
- Developing coordinated incident management systems with county emergency management groups
- Coordinating with emergency service providers to reduce emergency response time
- Developing automated systems to detect wildlife for critical roadway sections
- Providing customized access to CDOT traveler information for other stakeholders
- Developing a communications master plan for rural areas

The *Eastern Colorado Regional Transportation Plan* considered ITS as a potential modal solution for future mobility demands. The plan's mobility strategy included improved ITS incident response, traveler information and traffic management along with encouraging the use and maintenance of DMS. As part of the corridor prioritization process, the projects were grouped into seven categories. Less traditional improvements such as ITS were placed in the Transportation Support Systems category. The two ITS-related projects shown in the *Eastern 2030 Preferred Plan* include: 1) providing data from an existing RWIS on U.S. 40 at First View



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

to information dissemination to motorists via traveler information, and 2) installing a new RWIS on I-70 at Stratton with the same information dissemination to motorists as described previously.

6.4 PROPOSED ITS FIELD DEVICES AND FUNCTIONS

Based on the results of the field survey, accident history review and recommendations from other planning studies, the ITS recommendations address the corridor operational and/or safety deficiencies requirements and contributing factors.

1. Increasing safety for commercial vehicle operations, addressing:
 - a. Speeding and driver expectations
 - b. Permit and oversize loads
 - c. Grades
 - d. HAZMAT issues and incident response
2. Disseminate localized real-time weather information to motorists, commercial vehicles and snow plow drivers, regarding:
 - a. Pavement surface conditions
 - b. Visibility
 - c. High wind advisories
 - d. Flood warning
3. Automate road closure procedures and provide better alternate route information to non-local motorists and commercial vehicles.
4. Reduce wildlife-vehicle collisions.

CCTV Cameras

CCTV cameras would monitor traffic conditions in real-time, and would verify incidents, road closure gates, weather conditions, and the status of other ITS field devices remotely without having to send personnel out into the field.

The functional capabilities of each CCTV camera will depend on the availability of existing communication infrastructure or cost of the proposed communication infrastructure. Where fiber optic infrastructure is available, the transport of full-motion video and camera control is feasible. However, where other communication infrastructure is needed, the minimal acceptable quality of video and camera control may be selected to balance the cost of recurring service costs based on the required bandwidth and transmission distance.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

The following locations are proposed for CCTV cameras:

- I-76 and U.S. 385 interchange
- U.S. 385 and SH-23 intersection
- South of U.S. 6 and U.S. 385 intersection
- U.S. 34 and U.S. 385 intersection
- South of U.S. 34 and U.S. 385 intersection
- U.S. 36 and U.S. 385 intersection (west leg to Idalia). The east leg of U.S. 6 and U.S. 385 has an existing RWIS station with camera.
- North of U.S. 40 and U.S. 385 intersection
- U.S. 385 north or south of the Republican River Bridge

Dynamic Message Signs

DMS will provide advance notification of upcoming traffic or weather conditions so motorists can make a decision at the next intersection or interchange to continue, rest, or choose an alternate route. These will provide information to motorists about highway construction/maintenance activities, traffic incidents (along with alternate routes, if needed), adverse weather conditions, highway/freeway closures and general traveler information (rest stops, visitor centers, etc.). They can also be used for Amber alerts, fire danger messaging and driver safety campaigns.

The following locations are proposed for overhead DMS:

- Eastbound (EB) I-70: About 2 miles west of U.S. 385 (Burlington) interchange
- EB I-76: About 2 miles west of U.S. 385 (Julesburg) interchange
- Westbound (WB) I-76: About 2 miles east of U.S. 385 (Julesburg) interchange or at the Colorado and Nebraska border

The following locations are proposed for roadside DMS:

- Northbound (NB) U.S. 385: About 1 mile south of I-70 interchange at Burlington
- Southbound (SB) U.S. 385: About 1 mile north of I-70 interchange at Burlington
- NB U.S. 385: About 1 mile south of I-76 interchange at Julesburg
- SB U.S. 385: About 1 mile north of I-76 interchange at Julesburg
- NB U.S. 385: About 1 mile south of U.S. 6 intersection at Holyoke
- SB U.S. 385: About 1 mile north of U.S. 6 intersection at Holyoke
- EB U.S. 6: About 1 mile west of U.S. 385 intersection at Holyoke
- WB U.S. 6: About 1 mile east of U.S. 385 intersection at Holyoke
- NB U.S. 385: About 1 mile south of U.S. 34 intersection at Wray



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

- SB U.S. 385: About 1 mile north of U.S. 34 intersection at Wray
- EB U.S. 34: About 1 mile west of U.S. 385 intersection at Wray
- WB U.S. 34: About 1 mile east of U.S. 385 intersection at Wray

- NB U.S. 385: About 1 mile south of U.S. 36
- SB U.S. 385: About 1 mile north of U.S. 36
- EB U.S. 36: About 1 mile west of U.S. 385
- WB U.S. 36: About 1 mile east of U.S. 385

- NB U.S. 385: About 1 mile south of U.S. 40 intersection at Cheyenne Wells
- SB U.S. 385: About 1 mile north of U.S. 40 intersection at Cheyenne Wells
- EB U.S. 40: About 1 mile west of U.S. 385 intersection at Cheyenne Wells
- WB U.S. 40: About 1 mile east of U.S. 385 intersection at Cheyenne Wells

Trailblazers



Trailblazers direct unfamiliar motorists to alternative routes due to incidents, inclement weather and road closures. These are particularly beneficial for travelers who are not familiar with the alternative route off of a primary highway corridor. Unlike DMS, trailblazers display only a few changeable words or graphics to indicate the direction that motorists should proceed on as part of the alternative routing plan. These devices have not been used extensively in Colorado. The following locations are proposed for trailblazers:

- EB off-ramp from I-70 to U.S. 385
- WB off-ramp from I-70 to U.S. 385
- NB U.S. 385 just south of I-70 EB on-ramp
- NB U.S. 385 just south of I-70 WB on-ramp
- SB U.S. 385 just north of I-70 EB on-ramp
- SB U.S. 385 just north of I-70 WB on-ramp

- EB off-ramp from I-76 to U.S. 385
- WB off-ramp from I-76 to U.S. 385
- NB U.S. 385 just south of I-76 EB on-ramp
- NB U.S. 385 just south of I-76 WB on-ramp
- SB U.S. 385 just north of I-76 EB on-ramp
- SB U.S. 385 just north of I-76 WB on-ramp

HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

- NB U.S. 385 just south of U.S. 6
- SB U.S. 385 just north of U.S. 6
- EB U.S. 6 just west of U.S. 385
- WB U.S. 6 just east of U.S. 385
- NB U.S. 385 just south of U.S. 34
- SB U.S. 385 just north of U.S. 34
- EB U.S. 34 just west of U.S. 385
- WB U.S. 34 just east of U.S. 385

- NB U.S. 385 just south of U.S. 36
- SB U.S. 385 just north of U.S. 36
- EB U.S. 36 just west of U.S. 385
- WB U.S. 36 just east of U.S. 385

- NB U.S. 385 just south of U.S. 40
- SB U.S. 385 just north of U.S. 40
- EB U.S. 40 just west of U.S. 385
- WB U.S. 40 just east of U.S. 385

- WB U.S. 40 just east of U.S. 287
- WB U.S. 40 just east of SH-59

Highway Advisory Radio (HAR)

HAR will provide larger messages and detailed information to motorists that cannot be provided on a DMS, working in conjunction with DMS. The following locations are proposed for HAR:

- I-70 and U.S. 385 interchange
- Vicinity of U.S. 6 and U.S. 385 intersection
- Vicinity of U.S. 34 and U.S. 385 intersection
- Vicinity of U.S. 36 and U.S. 385 intersection
- Vicinity of U.S. 40 and U.S. 385 intersection
- Vicinity of U.S. 40 and U.S. 287 intersection

Road Weather Information Systems

A new RWIS should be installed at the U.S. 385/Republican River bridge for advance notification of potential flooding. The design for this should include a communication link and an upstream sensor to notify the existing roadway warning system deployed at the bridge. If this is not feasible, it is recommended that CDOT first investigate the location and condition of



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

the float sensors hardwired to the controller in the roadway warning system. Replacement of the floats may be necessary to reduce or eliminate the number of false activations placed by the system. Alternatively, the float sensor could be replaced with a bridge mounted ultrasonic sensor that measures the water level from above, thus making it less susceptible to the constant effects of silting.

The following locations are proposed for RWIS:

- I-70 and U.S. 385
- U.S. 385 at 90° turn location (approximately 15 miles north of Holyoke)
- U.S. 385 south of Holyoke
- U.S. 385 north of Wray
- U.S. 385 at 90° turn location (approximately 17 miles north of Cheyenne Wells)
- U.S. 385 west of Cheyenne Wells

Automated Road Closure System

The existing road closure gates currently deployed in the corridor are the manual type. Consideration should be given to automating this process by using automated road closure systems through the use of a secured web site. This is an ITS service that has not been implemented by CDOT at this time. Automated road closure systems use lane gates, similar to railroad crossing gates, at intersections and ramps. Advance warning signs and LED flashers should accompany any automated road closure system in advance of the affected intersection or interchange. Aside from operating the gates remotely through a secured web site, the gates should have provisions for opening and closing the gate while at the site (both electronically and manually) plus through a handheld remote that can be provided to CDOT maintenance personnel. Finally, a dedicated or traffic surveillance CCTV camera can be provided at a good vantage point to verify that the gate is in its proper position and to verify motorist compliance with the gate. In the event of a gate violation, the remote user can notify dispatchers about the vehicle information to CSP and CDOT to avoid accidents involving stranded vehicles and snowplows.

A road closure contact list should be prepared for the CTMC operators and other CDOT personnel to notify affected local agencies along the corridor. The road closure contact list should also include designated personnel from Kansas DOT and Nebraska DOR, especially if the closure will cause an impact to their transportation system. Road closure information and alternative recommended routes that take motorists into Kansas or Nebraska can be coordinated with each state's respective DOT/DOR. Likewise, any road closure information and associated routing can be provided to CDOT from KDOT and NDOR. Initially, it should be as basic as developing a concept of operations whereby the CTMC personnel go through a contact list for a representative at KDOT and NDOR and making a phone call.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Automated road closure systems are proposed for the following locations:

- EB and WB I-70 at U.S. 385 interchange, including on-ramps
- EB and WB I-76 at U.S. 385 interchange, including on-ramps
- NB and SB U.S. 385 at U.S. 6 intersection
- NB and SB U.S. 385 at U.S. 34 intersection
- NB and SB U.S. 385 at U.S. 36 intersection
- NB and SB U.S. 385 at U.S. 40 intersection
- EB and WB U.S. 40 at U.S. 385 intersection
- EB and WB U.S. 40 at U.S. 287 intersection
- U.S. 385 north and south of Republican River Bridge

Downhill Curve/Speed Advisory System

Downhill curve advisory systems provide reduced speed warnings to assist drivers of commercial vehicles and RVs to lower their speeds in order to prevent the vehicles from overturning at horizontal curves. These systems could provide information to commercial vehicle and RV drivers who might not be familiar with the geometrics and terrain of U.S. 385.

The signage consists of static information or dynamic information that can be changed when prevailing weather affects the surface conditions at the curve. Curve advisory systems are proposed at the following locations:

- 90° horizontal curves on U.S. 385 between Cheyenne Wells and Burlington
- 90° horizontal curves on U.S. 385 between Holyoke and Julesburg

Downhill speed advisory systems post downhill speed limits with flashing beacons for commercial vehicles and RVs. In addition, the system contains radar capabilities accompanied by a LED sign that posts individual spot speeds of vehicles approaching the system. Downhill speed advisory systems are proposed at the following locations:

- NB and SB U.S. 385 approaching Wray



Wildlife Warning Systems

The purpose of a wildlife warning system is to monitor both sides of U.S. 385 for wildlife approaching the roadway. When wildlife is detected entering the roadway, the system automatically triggers the warning system to alert approaching motorists of the presence of wildlife so the vehicles can slow down to avoid a potential accident. Warning systems consist of a sign and flashing beacons located at the beginning of the monitored roadway and intervals in between depending on the length of roadway

HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

the system is being deployed on. Proposed systems should be able to detect any size animal in all light and weather conditions. In order to accomplish this, the system's sensors should be radio frequency (RF) based that operates at a low power level safe for humans and wildlife. The system should have the capability to record the time and date of wildlife crossings to ascertain the frequency of the warning activations. Recent research activities into the effectiveness of wildlife warning systems indicate that both the flashing beacon and "Animal Present When Flashing" sign should be replaced with a small DMS mounted onto the pole structure. This alteration will increase the cost of the system, but should be verified prior to moving forward with an actual design for the corridor to enhance the effectiveness of the deployment.

Proposed locations of wildlife warning systems are as follows:

- U.S. 385 south of Wray
- U.S. 385 at the Arikaree River
- U.S. 385 at the Republican River
- U.S. 385 at drainage area adjacent to Smoky Hill River

6.5 INSTALLATION, OPERATIONS AND MAINTENANCE, REGIONAL AND STATEWIDE INTEGRATION CONSIDERATIONS

Electrical service and communication provisions will be important in the selection and siting of devices. An appendix is included describing the options and issues associated with these factors.

Operations and maintenance are significant in the effectiveness of ITS field devices. Investment decisions into the deployment of ITS field devices must take into account the operational strategies associated with these capital improvements. Sharing of this information and coordination among the local agencies and public safety agencies on the highway corridor is paramount to develop a "two-way" conversation that can only enhance the usefulness of the installed infrastructure. To achieve these objectives, the following steps should be taken:

- The functionality, planned and unplanned maintenance requirements, and coordination needs of the system must be fully understood among CDOT-Region 1, CDOT-Region 4, and CDOT-ITS to accept the responsibilities each entity will be required to sustain.
- Coordination with KDOT and NDOR personnel should occur with highway closures and incidents.
- A concept of operations should be developed to ensure that the system provides timely and accurate information to build motorist trust.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

The majority of the ITS field devices and remote communications proposed herein conform to the National ITS Architecture, which provides a common framework for planning, defining, and integrating ITS. Adherence to the National ITS Architecture assures that the ITS field devices and communication methodology are consistent with the Colorado Statewide ITS Architecture since all statewide ITS architectures are based on the national version. The only system not fully recognized as of yet is the wildlife warning system. However, given that these system deployments have increased in the northern states, it is only a matter of time before the accepted functionality of the system is incorporated into the architecture.

All of the communications to the proposed ITS field devices conform to the National Transportation Communications for ITS Protocol (NTCIP), which is a family of standards and terminology necessary to facilitate interoperability among different ITS equipment manufacturers within a single system. Although the automated road closure system and wildlife warning systems have not been employed by CDOT to date, all of the vendors that provided information on their systems stated that they would be willing to provide their application programming interfaces (API) to allow consolidation into the Colorado Transportation Management Software (CTMS) utilized to control a variety of disparate ITS field devices from a single application.

While all of the planned ITS field device control occurs remotely from the CTMC, there are options to provide CDOT personnel and local agencies with the ability to interface with the ITS field devices. If the interface deals primarily with viewing the status of various ITS field devices, this could easily be accomplished through the Internet. Conversely, if the interface involves control of ITS field devices (e.g., CCTV camera control, DMS message selection, etc.), a secure methodology that makes use of accepted prioritization schemes would need to be developed.

6.6 CONCEPTUAL COST ESTIMATES

Since not all recommended technologies have a quantifiable need that can be compared to accident rates or other measures of a possible problem, it is difficult to prioritize the various ITS field device projects using a ranking scheme. However, recommended devices can be implemented independent of or in conjunction with planned highway construction projects along the corridor.



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Table 6.1 ITS-Related Unit Costs

Item	Anticipated Service Life (years)	Capital Cost (2007 dollars)		Estimated O&M Cost (per year)		Comments
		Low	High	Low	High	
CCTV camera	10	\$10,000	\$12,000	\$1,100	\$1,500	Cost includes a CCTV camera, dome, pole mounting hardware, cabling, pole-mounted cabinet, optical transceiver and installation. Assumes existing luminaire pole is utilized with power tapped from the transformer base. Add additional \$3,000 for new pole and foundation.
DMS – overhead	10	\$200,000	\$250,000	\$9,800	\$12,900	Cost includes sign, support structure, foundation, cabinet, controller, cabling, electrical service and installation.
DMS – roadside	10	\$90,000	\$100,000	\$4,800	\$5,300	Cost includes sign, support structure, foundation, pole-mounted cabinet, controller, cabling, electrical service and installation.
Trailblazer	10	\$4,000	\$5,000	-	-	Cost includes sign, post, foundation, post-mounted cabinet and controller.
HAR	20	\$40,000	\$70,000	\$1,600	\$2,000	Cost is for 10 watt HAR that includes processor, antenna, transmitters, battery back-up, electrical service, cabinet, cabling and license fee. Cost does not include solar arrays and associated batteries. Higher capital cost related to grounding plane requirements.
HAR advance signing	10	\$5,300	\$9,400	\$300	\$400	Cost is for sign with flashing beacons and includes the cost of the controller.
RWIS	25	\$40,000	\$80,000	\$2,700	\$6,700	RWIS can include a pavement temperature sensor, precipitation sensor, wind sensor, air temperature and humidity sensor, visibility sensors, CCTV camera,



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Item	Anticipated Service Life (years)	Capital Cost (2007 dollars)		Estimated O&M Cost (per year)		Comments
		Low	High	Low	High	
						remote processing unit (RPU) and electrical service. RPU usually needs to be replaced every 5 years at a cost of roughly \$6,700. O&M costs include calibration, equipment repairs and replacement of damaged equipment. Lower capital cost indicates minimal sensor deployment and no camera.
Automated road closure system	20	\$15,000	\$18,000	-	-	Cost includes pole, base gate support, actuator, steel support, saddle, gate arm, LED indicators and software. Cost is based on a 120 VAC system, but electrical service is not included.
Curve warning system	-	\$3,600	\$6,500	-	-	Cost includes sign, support structure and foundation. Electrical service or solar power system is not included.
Downhill speed advisory system	-	\$4,800	\$8,700	-	-	Cost includes static speed sign, radar detector, display system, support structure, and foundation. Electrical service or solar power system is not included.
Wildlife warning system	-	\$55,000	\$75,000	-	-	Cost is per mile for five stations on both sides of the highway with pole-mounted cabinets, one master unit and four flashing beacons. System needs electrical service, but acquiring electrical service is not reflected in the cost. Higher cost is attributed to either the use of fuel cells or a solar array and batteries at each station.
Dial-up circuit	-	\$600	\$1,000	\$700	\$1,300	Initial capital cost is for 64 Kbps circuit installation. O&M costs are for recurring



HIGH PLAINS HIGHWAY

CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

Item	Anticipated Service Life (years)	Capital Cost (2007 dollars)		Estimated O&M Cost (per year)		Comments
		Low	High	Low	High	
						annual costs.
T-1 circuit	-	\$600	\$1,000	\$5,100	\$10,100	Initial capital cost is for 1.544 Mbps circuit installation. O&M costs are for recurring annual costs.
Cellular data service	-	\$530	\$940	\$130	\$1,800	Capital cost is for cellular modem. O&M is the service cost based on the amount of data transmitted per month. Service costs can vary among different providers.
Satellite data service	-	\$700	\$1,400	\$0.45	\$1.00	Capital cost is for satellite data modem. O&M is the service cost per minute. Cost variation based on satellite service provider selected.
Fiber optic cable installation	20	\$21,000	\$55,000	\$1,100	\$2,700	Cost is per mile for underground installation. Cost typically lower in rural settings. Underground installation would cost significantly less if implemented in conjunction with another construction project. Cost would also be less if aerial installation could be utilized on existing power poles, but O&M costs may increase.
Spread spectrum radio	-	\$4,900	\$8,600	\$150	\$450	Cost is per link.
Broadband wireless	-	\$3,000	\$3,200	\$180	\$230	Cost is per link. Does not include mounting structure, hardware, cabling, power, cabinets, Ethernet switches, configuration and installation.
Terrestrial microwave	-	\$5,300	\$20,000	\$530	\$1,100	Cost is per microwave spur link. Higher costs could be dependent on frequencies utilized, antenna type and tower needs.



HIGH PLAINS HIGHWAY CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

6.6 ITS FUNDING OPPORTUNITIES

ITS projects can typically be implemented without major impacts or geometric improvements to the existing roadway infrastructure. These projects provide relatively cost-effective, high-benefit solutions to certain operational and safety deficiencies.

Certain ITS projects qualify for Hazard and Safety Elimination Grants (HES) and Congestion Management and Air Quality funds similar to any other transportation improvement. However, ITS projects also lend themselves to inclusion as a smaller component of larger roadway projects such as resurfacing or bridge replacement projects. When added to these larger projects, the ITS portion of the projects can enhance the mobility and safety of the roadway while taking advantage of project-related traffic control and mobilization.

ITS project components can also be implemented as part of a shared resources agreement, as is often seen with communications networks. For example, allowing a fiber optics private industry partner use of CDOT right-of-way in exchange for a portion of the fiber optic backbone can result in significant monetary savings since communications can often be the most expensive component of an ITS installation.

SAFETEA-LU identifies funding specifically for ITS projects in Titles I through VI. This funding includes both matching funds as well as research grants.

The Colorado Transportation Management Center (CTMC) serves as the Statewide CDOT ITS branch. As such, this branch develops strategic ITS plans and deploys ITS projects across the state. Any ITS projects proposed along the High Plains Highway Corridor will have a greater opportunity for funding if they are aligned with the CDOT Statewide goals in the ITS Architecture Plans. ITS project recommendations in this study have taken into account the Statewide ITS vision.

An important component when seeking funding for ITS projects is effectively conveying the benefits derived from implementation. A useful website for finding this type of information is the national USDOT website for this topic (www.benefitcost.its.dot.gov). In Colorado, the ITS branch has summarized benefits of ITS elements that are in place around the state. This information can be found on the internal CDOT ITS website.



HIGH PLAINS HIGHWAY
CORRIDOR DEVELOPMENT AND MANAGEMENT PLAN

APPENDIX A: CONSTRUCTION COST ESTIMATES

APPENDIX B: ENVIRONMENTAL OVERVIEW

APPENDIX C: ELECTRICAL SERVICE & COMMUNICATION NEEDS FOR ITS
DEVICES

AVAILABLE ON CD

