

ALTERNATIVES TECHNICAL REPORT
FOR THE
6TH AVENUE PARKWAY EXTENSION
ENVIRONMENTAL ASSESSMENT

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LIST OF ACRONYMS

AFB.....	Air Force Base
CDOT	Colorado Department of Transportation
E-470	E-470 Tollway
EA.....	Environmental Assessment
FEMA.....	Federal Emergency Management Agency
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
GOCO.....	Great Outdoors Colorado
LOS	Level of Service
NRD.....	Natural Resource Damage Funds
PMT	Project Management Team
PROS	City of Aurora Parks Recreation and Open Space
SH 30	State Highway 30
TWG	Technical Working Group
UDFCD	Urban Drainage and Flood Control District

1. INTRODUCTION

This technical report summarizes the evaluation process used to establish the Proposed Action for the 6th Avenue Parkway extension project. The multi-step screening process considered the purpose and need, operations, engineering criteria, property impacts, environmental considerations, and community acceptance. The screening process included public and agency involvement and previous planning studies, resulting in a Proposed Action with broad public and agency support. This technical report further describes the alternatives screening process, describes the alternatives fully evaluated in an Environmental Assessment (EA), and identifies the alternatives eliminated during the screening process resulting in the Proposed Action. This technical report serves as the foundation for and is included as an appendix to the EA.

2. PURPOSE AND NEED

The purpose of the project is to implement a transportation solution that will close a critical gap in the regional transportation network to enhance east-west, and regional mobility within the eastern portion of the City of Aurora.

The project is needed to address the following:

- Lack of connectivity and an efficient transportation link in the Aurora arterial system
- Excessive travel time and vehicle miles traveled for motorists and emergency vehicles
- Inefficient infrastructure to support existing and future multimodal connectivity
- Inadequate transportation infrastructure to respond to planned development

3. ALTERNATIVES DEVELOPMENT

Alternative alignments were developed building on information from previous planning studies, and ideas suggested during the public and stakeholder process. Six initial alternatives were developed and refined through this process as discussed in **Section 4**.

3.1 Previous Planning Studies

The City of Aurora conducted previous planning studies dating back to 1986 that evaluated the extension of 6th Avenue. These planning studies are summarized in **Table 1**. Information from these studies was referenced as alternatives were developed and ultimately served as the foundation for establishing the six initial alternatives.

Table 1 Previous Planning Studies Incorporated into Alternative Development

Study	Date	Finding
Comprehensive Plan, City of Aurora	1986	An extension of 6 th Avenue east of existing 6 th Avenue is depicted in the plan as an expressway.
Preliminary Alignment Study for East 6 th Avenue from State Highway (SH) 30 to 3000 feet East of Gun Club Road	April 1996, Revised March 1997	Four initial alignments were identified and evaluated in the study. Each of them connected to SH 30 and extended east to the E-470 Tollway (E-470). Several alternatives continued improvements east from E-470 to Gun Club Road eventually reconnecting with 6 th Avenue east of E-470. One alternative and one modified alternative were favorable for further evaluation. However, at the conclusion of this study, the location of the E-470/East 6 th Avenue interchange had not yet been determined.
Conceptual Phase II Alignment Study	December 1997, Revised July 1998	This study identified one preferred alignment for 6 th Avenue that extended directly west from the 6 th Avenue/E-470 interchange, south of the Confluence Open Space, eventually connecting with SH 30. This alignment assumed that the 6 th Avenue/E-470 interchange would be located directly east of the existing 6 th Avenue. A preliminary alignment was selected after it was determined that the 6 th Avenue/E-470 interchange was to be located one-half mile south of the existing 6 th Avenue alignment making the initial preferred alignments not feasible. This interchange was situated at this location due to spacing requirements between interchanges set by the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT).

3.2 *Public and Stakeholder Input into Alternatives Development*

The alternative development and screening process benefitted greatly from the public and agency involvement program, which complemented the previous planning studies and analyses conducted by the project team. Public involvement included general public meetings, one-on-one meetings with property owners, webpage information, and a range of opportunities to comment through email, phone, and written comments. The alternative development and screening process has received public and agency input through the following meetings and outreach:

- Public Open Houses – Invited stakeholders included the general public, community, agency, and municipal representatives. At the first public meeting, the project team presented and solicited input on the initial six alternative alignments. The second meeting held March 2015 presented 4 alignments and solicited input from the public on their preference of alignments. Three public meeting/open houses are being conducted as part of the project. Previous meetings were held on December 3, 2014 and March 18, 2015. After release of the EA a public meeting is anticipated for Spring 2016.
- Project Management Team (PMT) meetings held approximately monthly beginning in September 2014 with City of Aurora. The PMT consisted of key City of Aurora staff involved in the decision making for the project.
- Technical Working Group (TWG) meetings held approximately monthly beginning in September 2014 with City of Aurora, Arapahoe County, CDOT, FHWA, Buckley Air Force Base (AFB), Urban Drainage and Flood Control District (UDFCD), and E-470. The TWG consisted of key stakeholders and agencies with interest in the project.
- Numerous additional coordination meetings were held with City of Aurora Parks Recreation and Open Space (PROS) Department, Arapahoe County Open Space Department, Great Outdoors Colorado (GOCO), as well as other City and County staff.
- Additional coordination meetings with CDOT and FHWA.

Input received from the public and stakeholders was thoroughly reviewed and taken into consideration during the alternatives development and screening process. Public and agency involvement during the EA process is further described in the EA.

4. ALTERNATIVES CONSIDERED AND SCREENING

The goal of the screening process was to identify and refine the transportation improvements that best meet the purpose and need of the project while protecting the human and natural environment. Alternatives were evaluated with respect to the transportation benefits provided, public input, and environmental consequences. The fundamental philosophy in the screening process involved identifying notable positive and negative characteristics of the alternatives, and screening the alternatives based on their ability to meet the project purpose and need.

Three levels of screening were conducted to evaluate alternatives as described below:

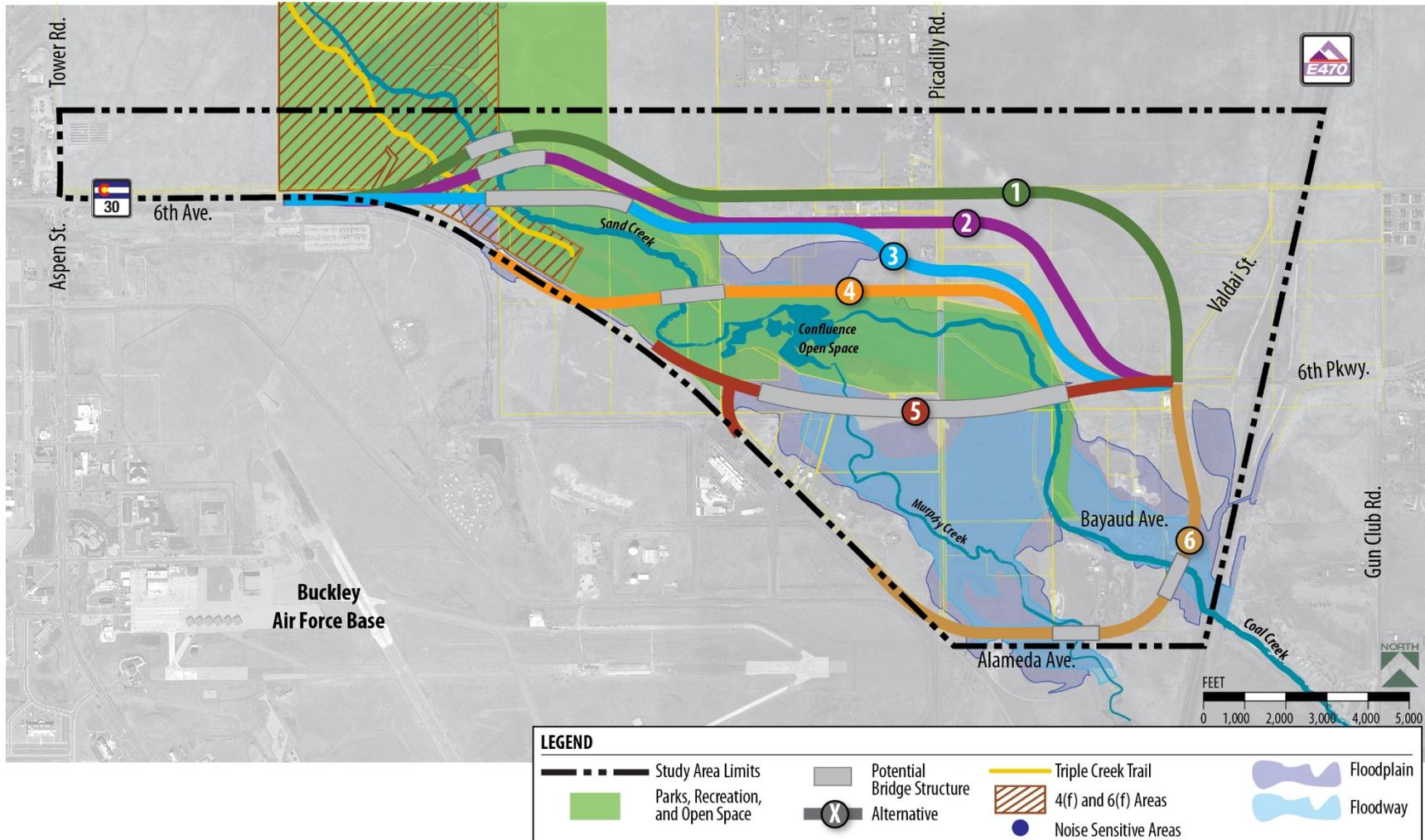
- Level 1a Screening – Fatal flaw analysis which included the ability of an alternative to meet the project purpose and need
- Level 1b Screening – Qualitative screening focusing on selected screening criteria
- Level 2 Screening – Quantitative and qualitative screening process that involved conceptual level design

4.1 Level 1a Screening

Six alternatives were analyzed during the Level 1a screening (**Figure 1**). Level 1a focused primarily on fatal flaw analysis, which included the ability of an alternative to meet the purpose and need. To determine if an alternative met the project's need, screening criteria were developed with the PMT and TWG and expanded on the requirements an alternative must have to meet the needs of the project. These screening criteria included qualitatively answering critical questions related to the project's ability to provide the following for the eastern portion of the City of Aurora and Arapahoe County:

- Does the alignment provide an efficient transportation link in the Aurora arterial system?
 - Will it provide an additional connection to get from the east side to the west side of Aurora in less time?
- Does the alignment reduce travel time and vehicle miles traveled for motorists and emergency vehicles?
 - Is there a decrease in distance from the intersection Tower Road/6th Avenue to the intersection of E-470/Jewell Avenue as traveled along 6th Avenue (SH 30) to the southeast?
- Does the alignment enhance and support existing and future multimodal connectivity?
 - Will the corridor be multimodal, which is defined to include existing and planned recreational facilities as well as sidewalks, trails, future bus transit and vehicles?
- Does the alignment provide transportation infrastructure needed to support planned development?
 - The land use and development trends within the corridor will result in additional demands on the transportation system. Providing access and maximizing travel ability to, through, and within the corridor are critical to supporting planned development. This includes maintaining and enhancing connections between major activity centers near the corridor. Does this alternative address these needs?

Figure 1 Level 1a Alternatives



All six alternatives were retained in the Level 1a screening process and carried forward into Level 1b alternatives analysis. The No Action Alternative did not meet the objectives of the Level 1a screening but was carried forward for comparison purposes. An evaluation matrix, with the results and rationale for elimination of alternatives during the Level 1a screening, is provided in Appendix A.

4.2 *Level 1b Screening*

The same six alternatives from Level 1a (**Figures 2 through 7**) and the No Action Alternative were carried into Level 1b screening. Level 1b screening was a qualitative screening and focused primarily on transportation operations, impacts to adjacent facilities, local access and circulation, property impacts, floodway/floodplain impacts, impacts to the parks, recreation, and open space properties within the project area, and noise impacts. The criteria used for Level 1b screening were fully vetted through the PMT, TWG, and public through a public meeting and included:

- Improve transportation operations and mobility
- Avoid and minimize adverse impacts to adjacent roadway facilities
- Enhance local access and circulation
- Provide transportation infrastructure that does not preclude planned development
- Minimize maintenance and operational requirements for drainageway crossings
- Avoid and minimize residential, commercial, and other property impacts
- Avoid and minimize impacts to floodways and floodplains
- Avoid and minimize environmental impacts to/from
 - Triple Creek Greenway Corridor
 - Section 4(f) Properties
 - Noise

Figure 2 Alternative Alignment 1

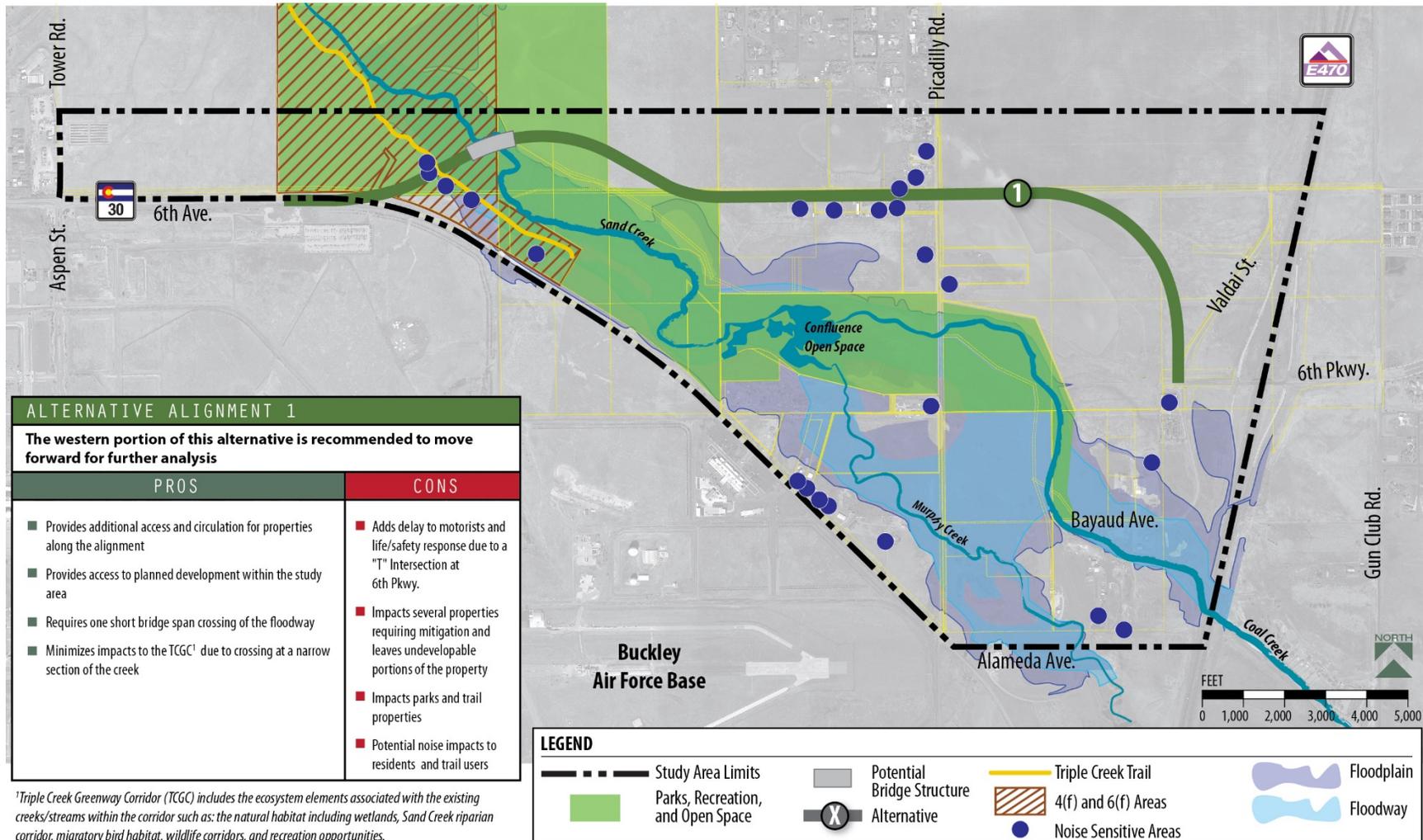


Figure 3 Alternative Alignment 2

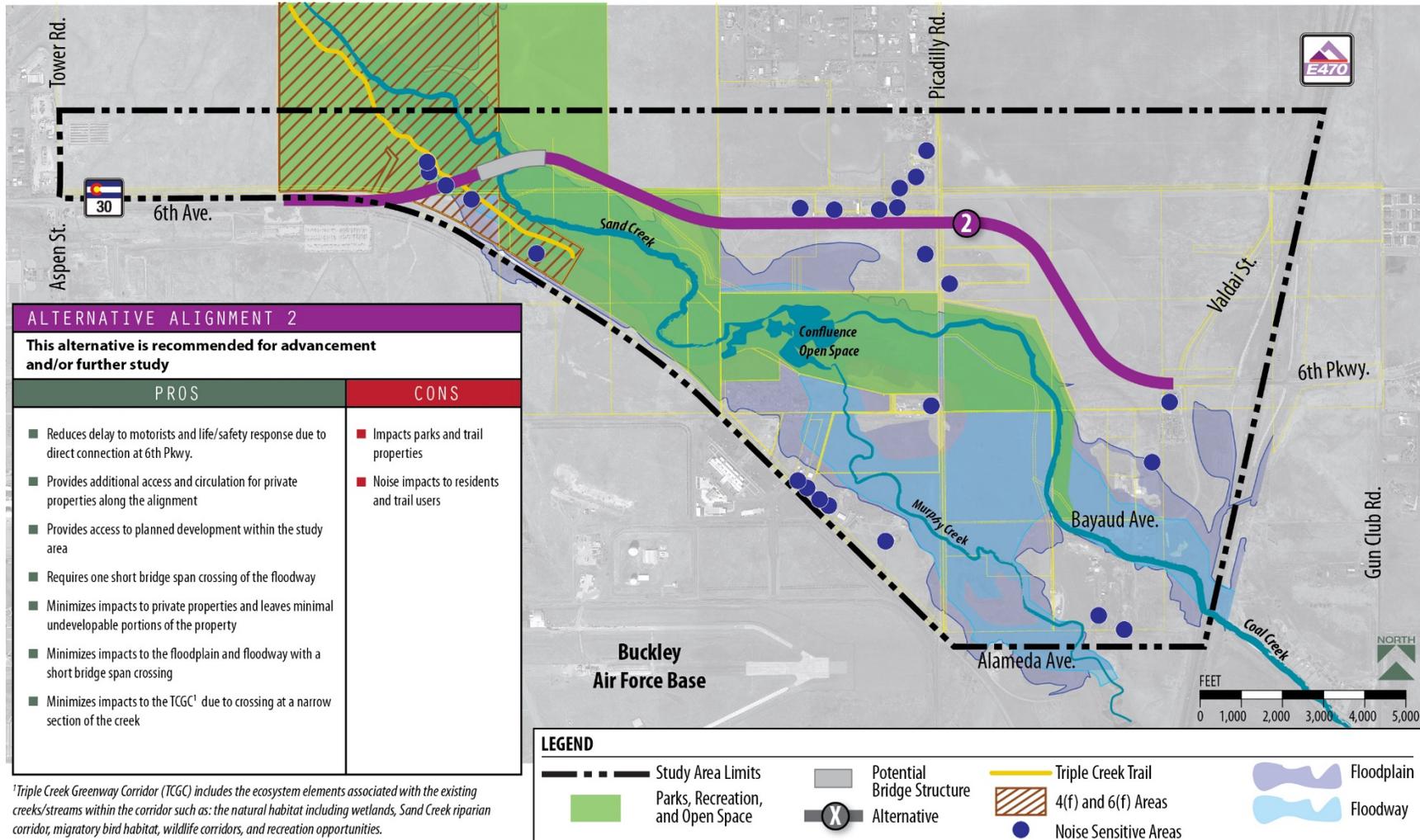


Figure 4 Alternative Alignment 3

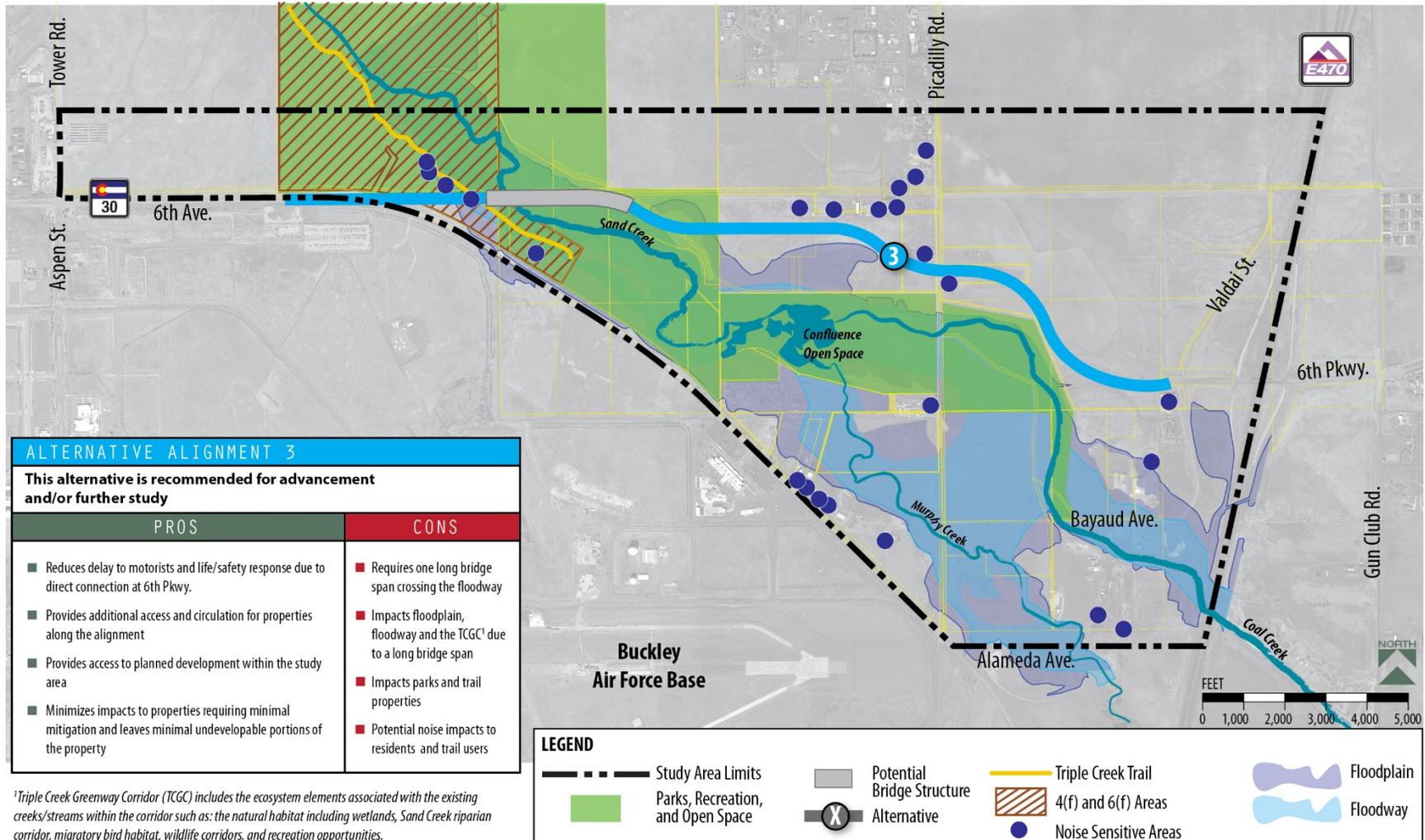


Figure 5 Alternative Alignment 4

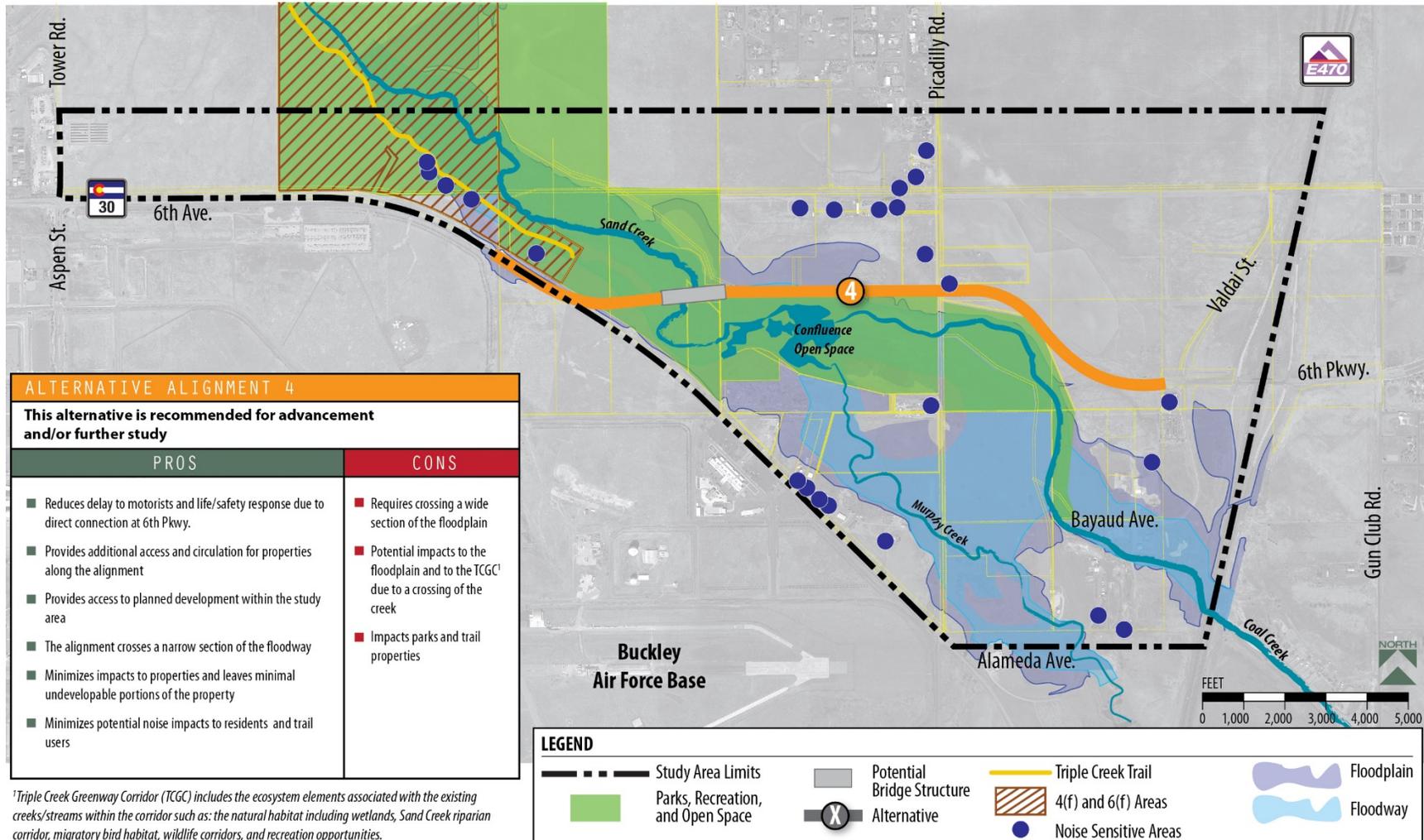


Figure 6 Alternative Alignment 5

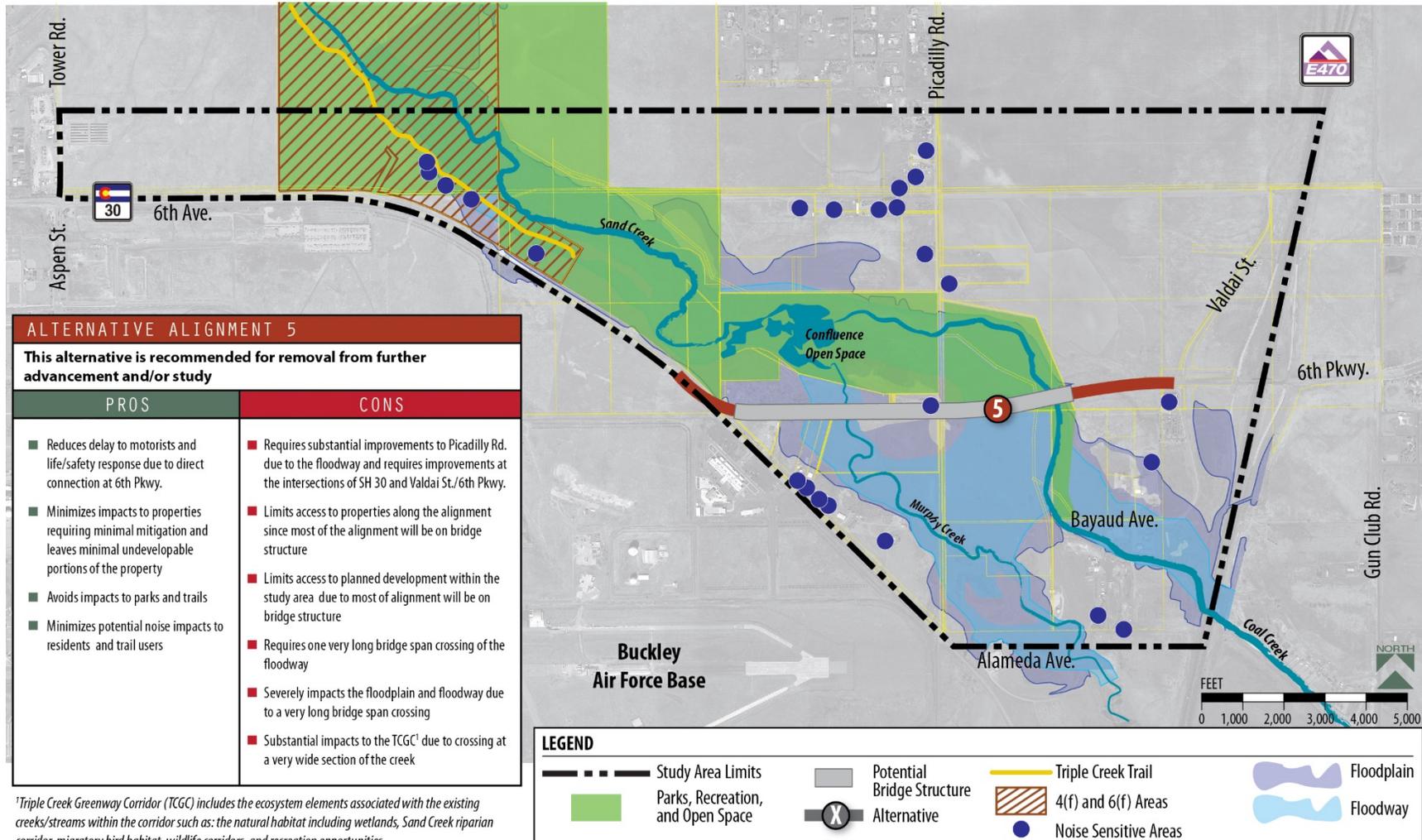
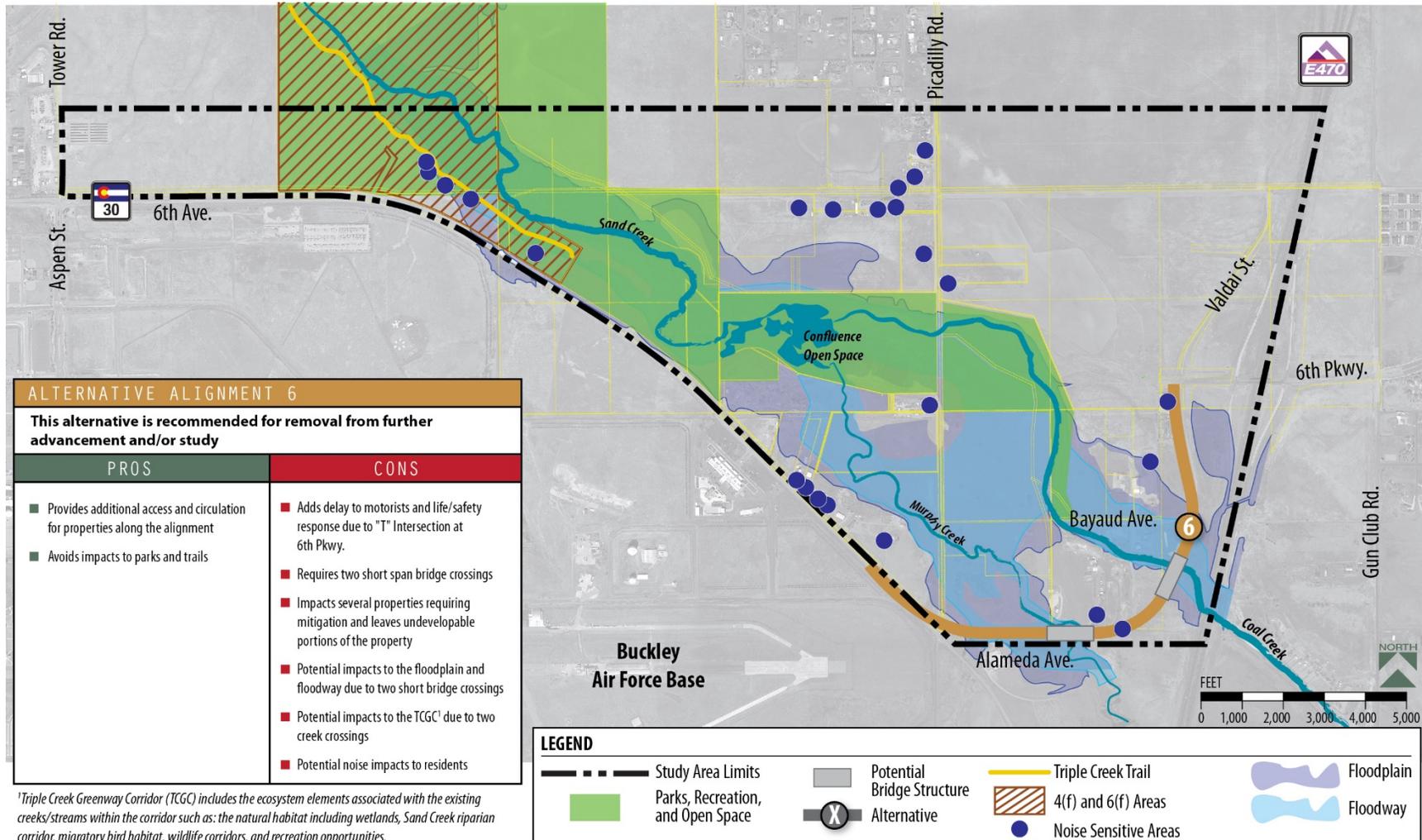


Figure 7 Alternative Alignment 6



Level 1b screening resulted in Alternatives 1, 2, and 4 being retained for further consideration with hybrid components, as well as the No Action Alternative. Alternatives 3, 5, and 6 were eliminated from future consideration for the following reasons.

- Alternative 3 – This alternative crossed a large expanse of an existing floodway/floodplain that would be very difficult to mitigate and could impact floodway/floodplain delineation on four properties in addition to City of Aurora owned property. In addition, this alternative requires one of the largest bridge openings and crosses Sand Creek at a skew, causing extensive ecological impacts. The alternative bisects several private properties increasing the potential for undevelopable remainders and minimizing the development potential for each property.
- Alternative 5 – This alternative crosses a large expanse of the existing floodway/floodplain that would be very difficult to mitigate and could impact a number of downstream insurable structures. The ecological impacts of crossing two streams (Murphy Creek and Coal Creek) and constructing bridge piers in the streams are substantial compared to other alternatives. The alignment crosses directly through properties and residential and commercial structures requiring displacements and acquisitions. The alignment would limit access above existing ground minimizing the ability to provide infrastructure to properties with a high potential for development that would require access. This also creates issues with the intersection of Picadilly Road that would need substantial reconstruction or grade separation.
- Alternative 6 – The alternative provides proportionately out of direction travel for the motorist and intersections at a “T” – three-legged intersection at the Valdai intersection, which adds a substantial amount of delay compared to other alternatives due to the need for a traffic signal. The ecological impacts of crossing two streams (Murphy Creek and Coal Creek) and constructing the bridge piers in the streams are substantial compared to other alternatives. Additionally, the floodway/floodplain would be impacted. There is minimal opportunity here to support planned development as there is little vacant land and access already exists.

An evaluation matrix with the results and rationale for elimination of alternatives during the Level 1b screening is provided in **Appendix B**.

4.3 Level 2 Screening

Level 2 screening was a quantitative and qualitative screening process that involved conceptual level design to further refine and develop alternatives with input from PMT and TWG over several meetings. Criteria developed and used for evaluating Level 2 alternatives were vetted thoroughly with the PMT and TWG and included public input received at the public meetings. Through the alternatives development and screening process, it was noted that while entire alternatives were not reasonable, some alignment segments were useful and could compliment another alternative. If a portion of an alternative had positive characteristics, attempts were made to retain the positive portions to create a hybrid alternative with another alternative.

Alternatives 1, 2, and 4 that were carried forward from the Level 1b screening were developed and refined with hybrid components to become the following four alternatives (**Figures 8, 9, 10, and 11**):

- Alternative 1A – To evaluate the best use of existing 6th Avenue right-of-way, this hybrid of Alternative 1 with Alternative 2 maintained the west portion of Alternative 1 along the existing 6th Avenue right-of-way, and the east portion of Alternative 2 where it ties to existing 6th Avenue Parkway, west of E-470.
- Alternative 2A – To address minimizing impacts to conservation easements, refinements to Alternative 2 were provided and this hybrid alternative was carried forward from the Level 1b screening. This hybrid of Alternative 2 maintained the west tie-in intersection location with SH 30 and bridge structure crossing location of Alternative 1. The remainder of Alternative 2A after the structure followed the alignment of Alternative 2.
- Alternative 4A – To minimize the crossing length of the creek this is a refined Alternative 4 from the Level 1b screening. Refinements to this alternative shifted the tie-in with SH 30 to the south of Coal Creek Arena and changed the bridge structure to cross Sand Creek at a skew.
- Alternative 4B – To address the close proximity of this roadway intersection with Picadilly Road and the existing 6th Avenue intersection with Picadilly, a hybrid of Alternative 2 (west side) and Alternative 4 (east side) was developed.

Level 2 screening criteria were divided into three overarching categories that included numerous sub categories:

- **Traffic Operations and Engineering Considerations**
 - Improve transportation operations and mobility
 - Avoid or minimize adverse impacts to adjacent roadway facilities
 - Balance regional travel and local access
 - Provide transportation infrastructure to respond to planned development
 - Consider feasibility and constructability of improvements
- **Property Impacts**
 - Avoid or minimize residential and non-residential property impacts
- **Environmental Considerations**
 - Avoid or minimize impacts to floodways and floodplains
 - Avoid or minimize environmental impacts

The screening matrix (**Appendix C**) was analyzed to identify differences and similarities between the alternatives. This analysis indicated that many of the screening criteria did not show substantial differences in benefits or impacts and, therefore, were not major differentiators between the alternatives. These are discussed below and in full detail in **Appendix C**.

Figure 8 Alternative Alignment 1A

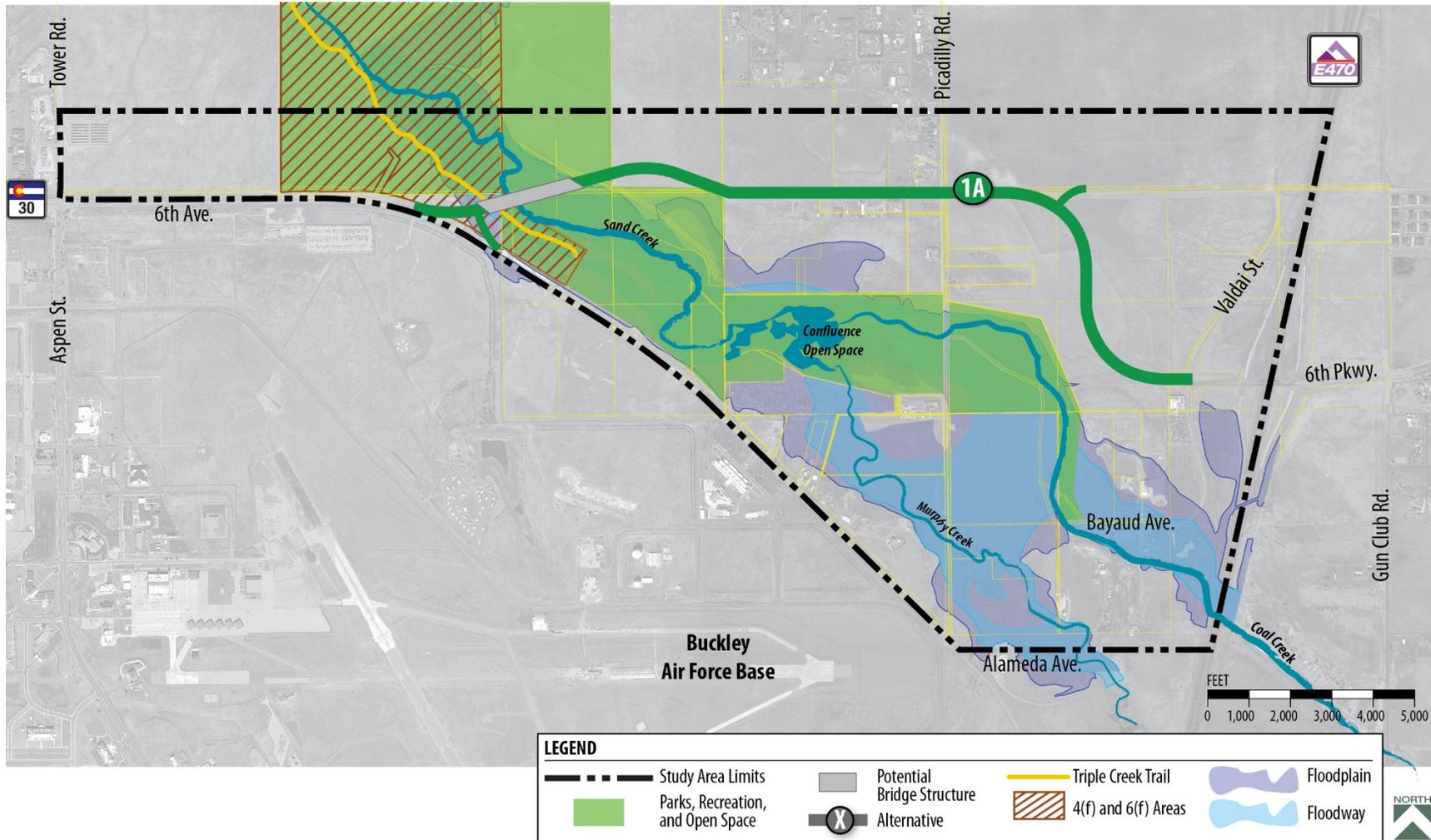


Figure 9 Alternative Alignment 2A

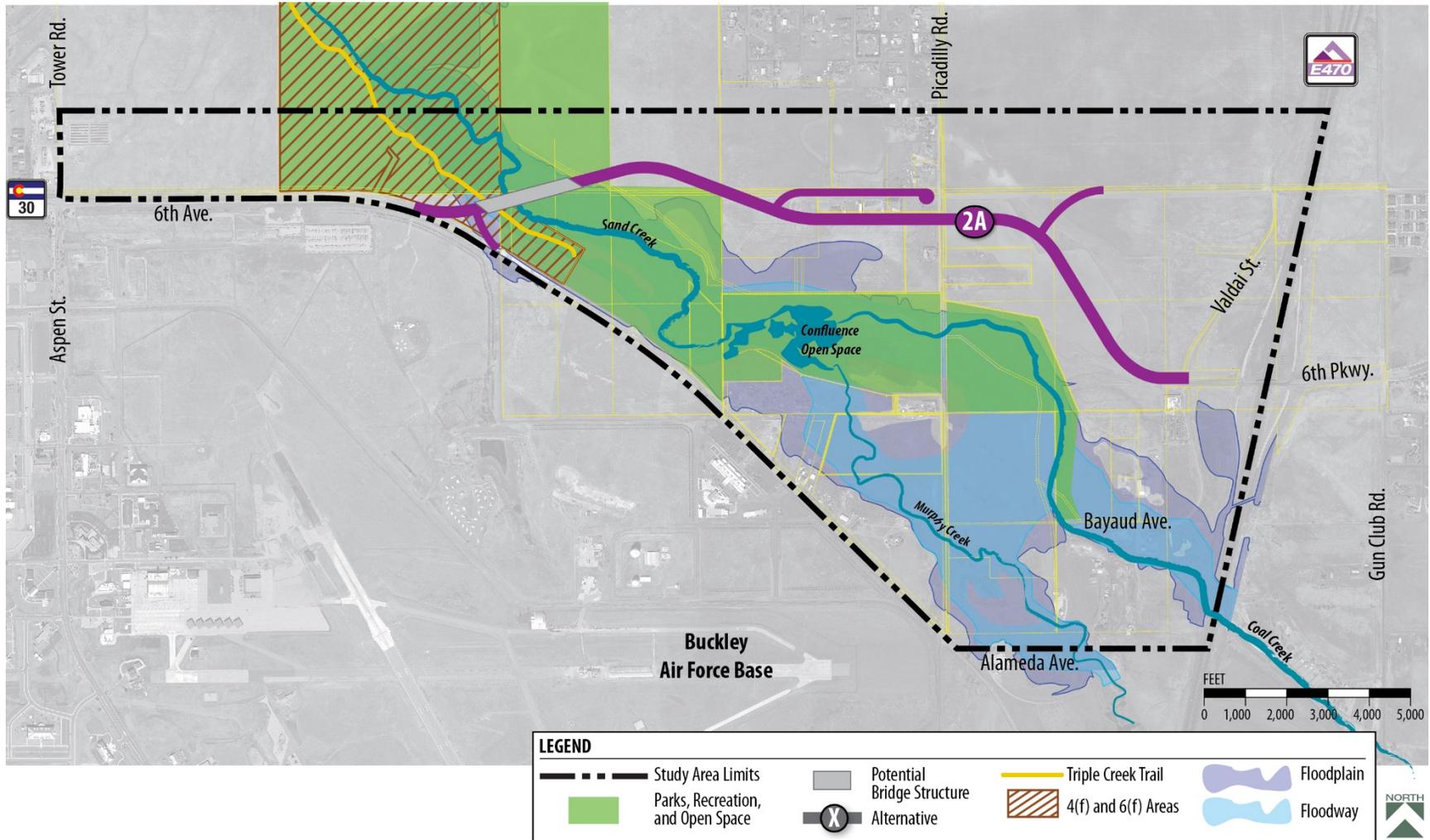


Figure 10 Alternative Alignment 4A

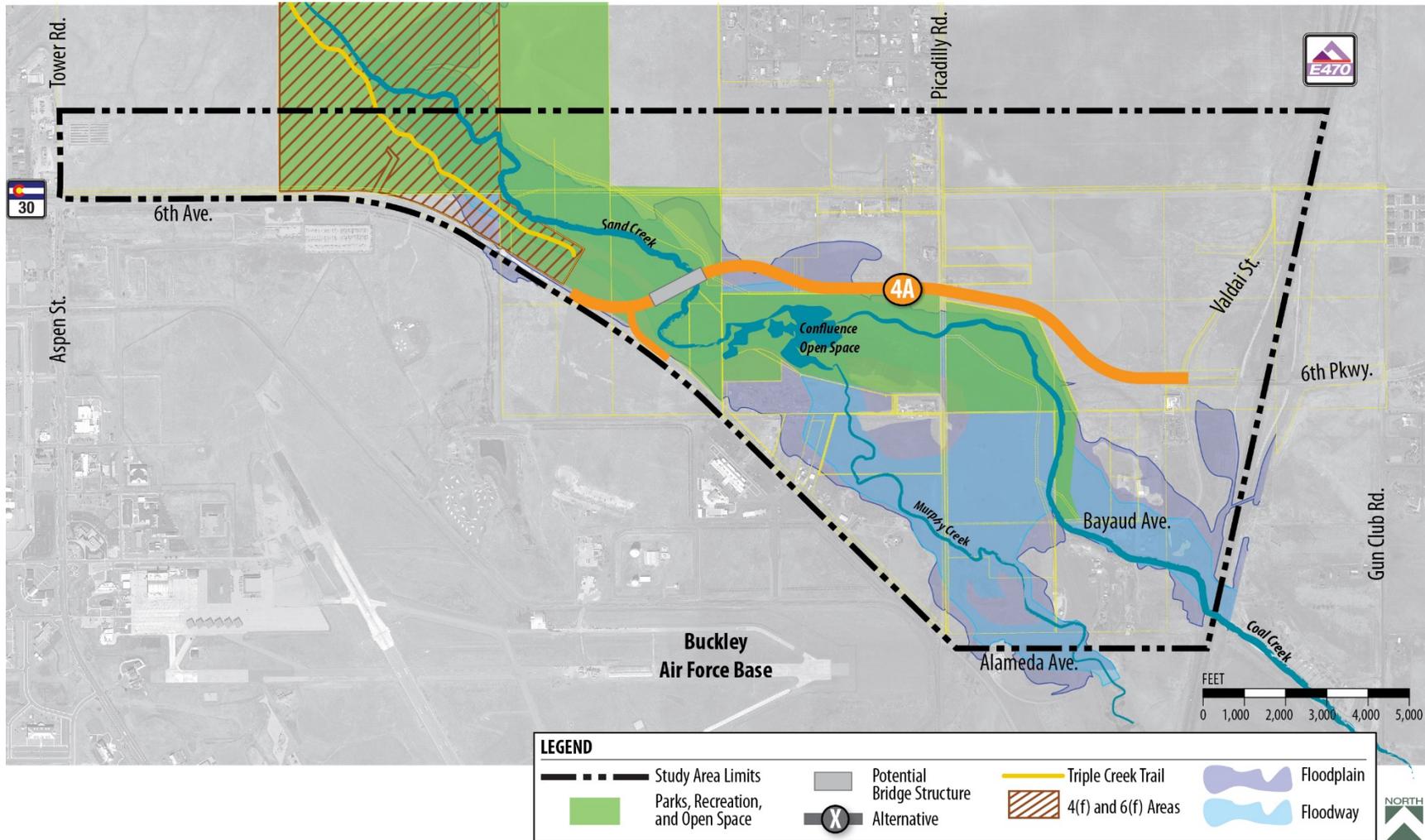
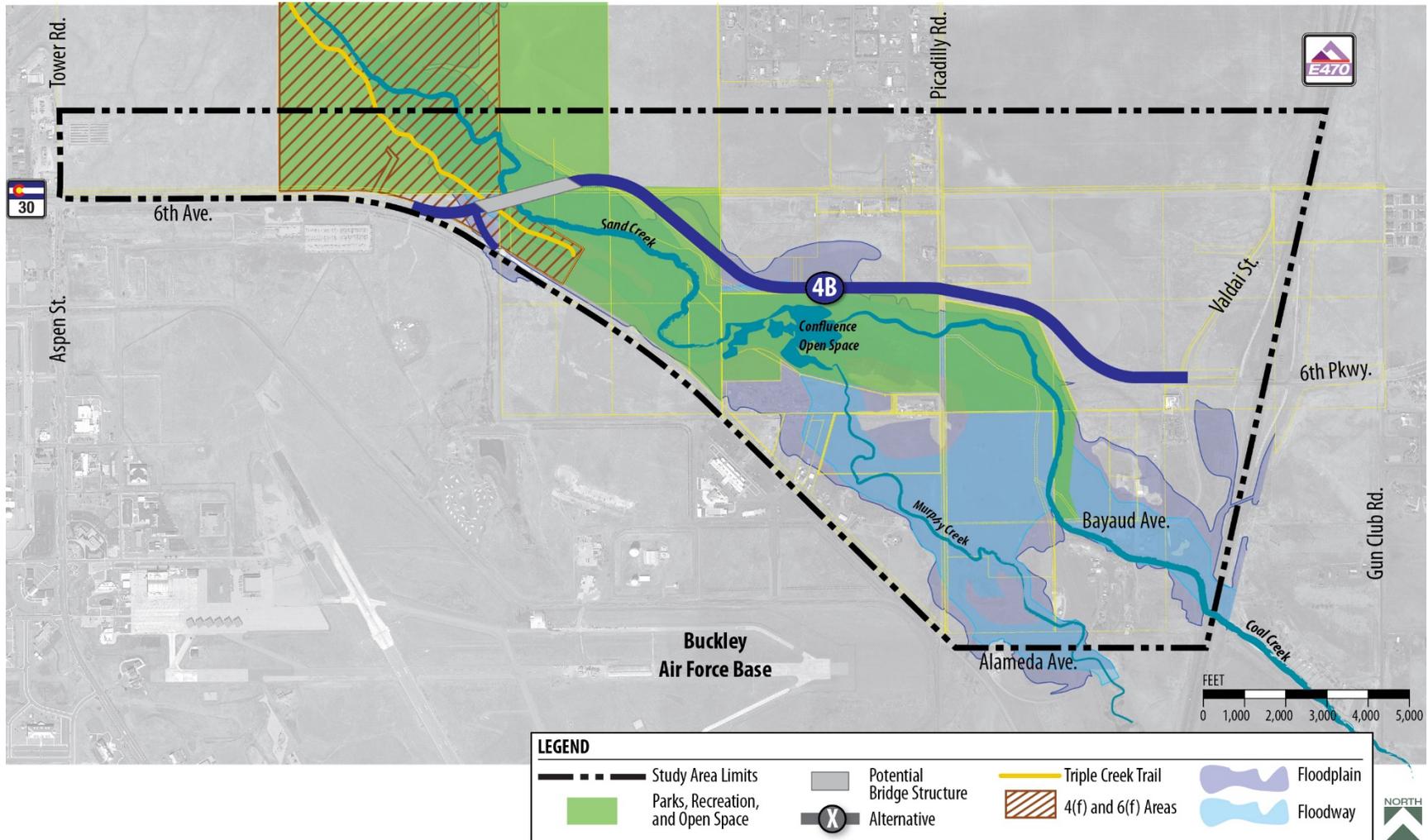


Figure 11 Alternative Alignment 4B



Traffic Operations and Engineering Considerations

- Improve transportation operations and mobility (travel time and level of service)
 - Travel time/emergency response time savings – This criteria was not a differentiator because all Level 2 alternatives improved travel time and emergency response times.
 - Levels of service (LOS) for 2035 traffic volumes at SH 30 and 6th Avenue – This was not a differentiator because all Level 2 alternatives performed at a LOS C.
- Balance regional travel and local access
 - Access provided from both the eastbound and westbound sides of alternative from existing properties – This was not a differentiator because all Level 2 alternatives provided access from both sides.
 - Future signalized intersection spacing impacted requiring new connections – This was not a differentiator because all Level 2 alternatives could be designed to accommodate appropriate intersection spacing.
- Provide transportation infrastructure to respond to planned development
 - Accessibility to 6th Avenue Parkway Extension from areas planned for development – This was not a differentiator because all Level 2 alternatives improved accessibility to areas planned for development that currently have little to no access. Improved access to areas planned for development was desired; however, it not a priority that access be provided to every area. Although some alternatives provided better access to areas planned for development, accessibility to these areas was determined by the PMT and TWG to not be a determining criteria in alternative selection.
 - Alternative consistent with future land use plans and local agency objectives – This was not a differentiator because the connection from SH 30 to the east has been in the City of Aurora Comprehensive Plan since 1987, and included in the City's 2007 update of the Northeast Area Transportation Study and 2009 Comprehensive Plan.
- Consider feasibility and constructability of improvements
 - Does alternative meet project design criteria – This was not a differentiator because all Level 2 alternatives met design criteria and did not require variances from existing City of Aurora design guidelines.
 - Bridge structure on a straight alignment – This was not a differentiator because all Level 2 alternatives were able to be constructed with a bridge structure on a straight alignment.
 - Overall bridge length – This was not a differentiator because the conceptual bridge structures would have similar types of construction, thus the cost per square foot would be similar for each. The bridge length at each crossing is a function of the roadway alignment, the angle at which the bridge crossed Sand Creek, and the resulting hydraulics of the portion of the creek being crossed. Each conceptual bridge layout attempted to find a balance among these criteria. Although there was a slight difference in length between alternatives, it was determined that the difference in length was not in and of itself a determining factor for influencing alternative selection.

Environmental Considerations

- Avoid or minimize environmental impacts
 - Impacted parcels that require voter approval – This was not a differentiator because none of the Level 2 alternatives would require voter approval.
 - Ability to maintain a Nationwide Section 404 permit – This was not a differentiator because at the Level 2 conceptual level of design, all Level 2 alternatives were able to maintain clearance under a Section 404 Nationwide Permit and did not require an Individual Permit.
 - Potential to impact suitable Ute ladies-tresses' orchid habitat – This was not a differentiator because all Level 2 alternatives had a low potential to impact the Ute Ladies-tresses' orchid habitat.
 - Acres of riparian habitat removed/impacted – This was not a differentiator because at the conceptual level of design, all alternatives impacted riparian habitat. Although, there was a desire from Aurora PROS and the public to avoid or minimize impacts to riparian areas, particularly those riparian areas closest to the Confluence Open Space that support high use bald eagle habitat, and a variety of water fowl.
 - Ability to accommodate wildlife movement corridors due to structure type – This was not a differentiator because all Level 2 alternative bridge structures would accommodate wildlife movement. While a shorter structure is less desirable because the bridge abutments are closer together thereby creating restrictive sight lines for wildlife, it was determined that this was not a major differentiator as wildlife would still utilize the shorter structure.

During the Level 2 screening process, there were several criteria that displayed notable differences in comparison of impacts. Differentiator criteria are those that rose to the top as high priority concerns by members of the PMT, TWG, and public or that had notable differences (e.g., residential relocations, biological impacts). These criteria became differentiator criteria that facilitated identification of the Proposed Action.

Traffic Operations and Engineering Considerations

- Avoid or minimize adverse impacts to adjacent roadway facilities (SH 30, Picadilly Road, Valdai Street)
 - Required length of reconstruction of SH 30, Picadilly Road, or Valdai Street – Tie-ins to existing roadways would be required for every Level 2 alternative. Some alternatives required adjustments to the vertical and horizontal profile of the roadway to tie-in 6th Avenue into the local and state roadway network. In some instances, the tie-ins would require substantial reconstruction of the existing roadway network. It was desired by members of the PMT and TWG to minimize impacts, including reconstruction and improvements, to adjacent roadways. Consider feasibility and constructability of improvements.
- Utility impacts – there are several major utility lines in the project area. These include a major 30-inch water line, 42-inch sanitary sewer interceptor line, and 16-inch reuse water line. Relocation and/or impact to these utilities would be very expensive and/or may not be feasible given the topographic profiles in the project area. City of Aurora

Water Department has expressed their preference that the larger water line not be impacted.

- Balance of regional travel and local access
 - Residential property accesses impacted – Numerous residents have access provided off of paved 6th Avenue. Safety and operational problems would result if an alternative would require multiple residences to have direct access points onto an arterial roadway (6th Avenue), which is not preferred by the City of Aurora or residents.

Property Impacts

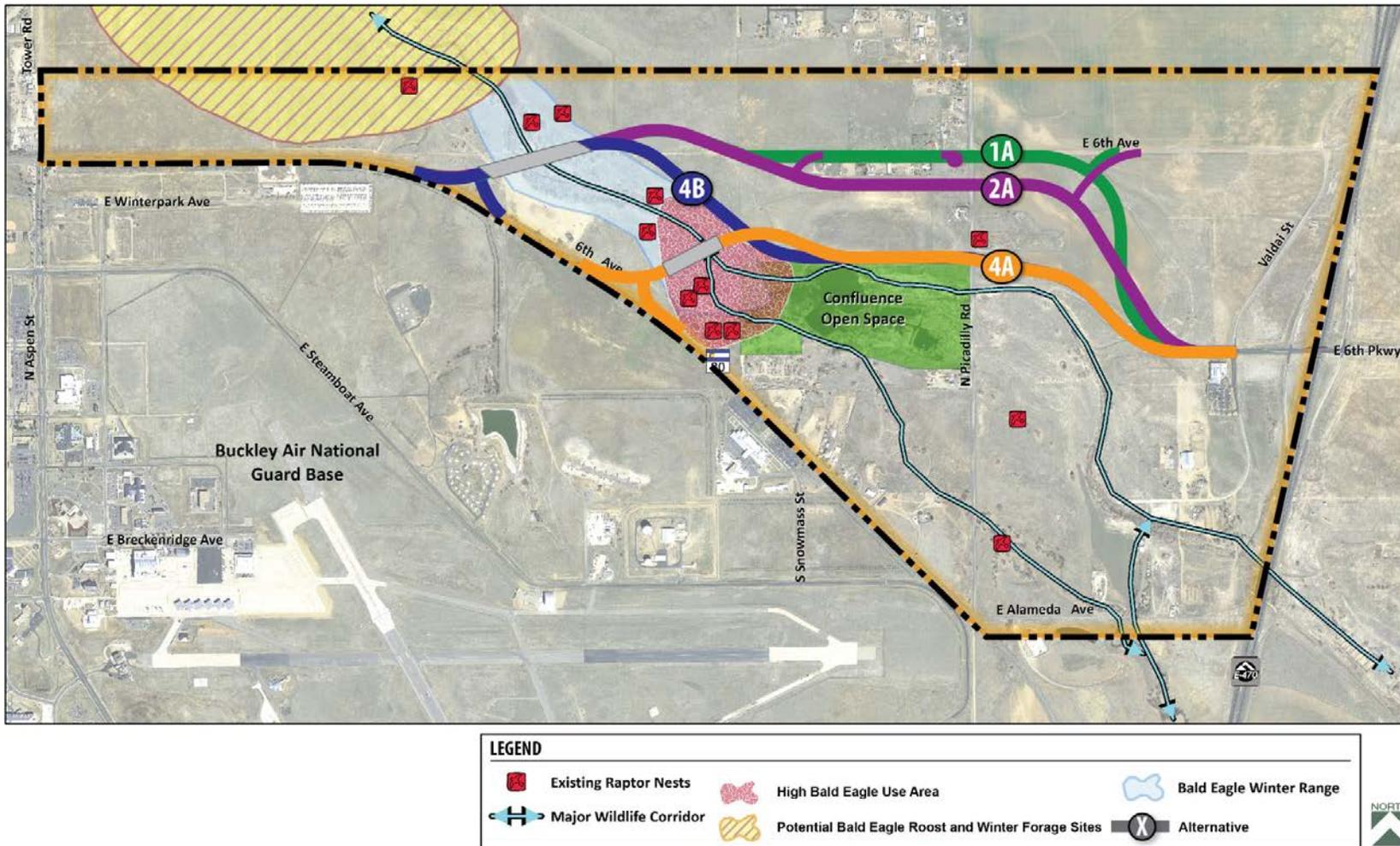
- Avoid or minimize residential and non-residential property impacts
 - Residential property permanently acquired – It was expressed by the PMT and TWG to minimize impacts to residential properties within the City of Aurora and Arapahoe County, even if it required a modification in the alternative design.
 - Non-residential property needs to be permanently acquired – It was preferred by the PMT and TWG to avoid non-residential properties; however, given the rural undeveloped nature of the study area it was desired to first avoid residential properties and secondly non-residential properties.
 - Partial acquisitions versus full acquisition of residential properties – There was a desire by the City of Aurora and Arapahoe County to minimize partial acquisitions of residential properties (a property was considered residential if there was a house located on the property) and to avoid full acquisitions. The City of Aurora owns numerous non-residential parcels in the study area and there was a desire to impact City owned parcels instead of impacting residential properties.
 - Partial permanent acquisitions of non-residential properties – Given the largely undeveloped nature of the study area, there is high likelihood that the area will experience development and growth in the future. It was desired by the PMT and TWG to avoid or minimize permanent acquisitions of non-residential properties while providing infrastructure to accommodate planned development.
 - Residential property relocations – The City of Aurora and Arapahoe County have expressed that they would like to avoid residential relocations. The City indicated that a minimum of 20 feet setback (distance from right-of-way) from a residence was required to not be considered a residential relocation. Those residences located less than 20 feet from the right-of-way would require relocation. Avoidance of residential relocations was also a major concern expressed by public at public meetings.
- Avoid or minimize impacts to floodways and floodplains
 - Floodway/floodplain Impacts – The City of Aurora and UDFCD follows Federal Emergency Management Agency (FEMA) regulations which have specific requirements regarding a rise and encroachment in the floodway/floodplain and to an impact to existing structures. Given the dominant presence of floodway/floodplain in the study area, this criterion requires careful consideration. In general, alternatives that cause a rise in surface water elevation are unfavorable. Also, a rise in surface water elevation that impacts structures and/or private properties is unfavorable according to FEMA and UDFCD. UDFCD and the City of Aurora expressed a

preference to avoid impacts to private property owners over city-owned property. There was a notable difference between alternatives as it related to rise in water surface.

Environmental Considerations

- Avoid or minimize environmental impacts
 - Section 4(f) Resources – Avoidance, minimization or mitigation of Section 4(f) resources should be considered while evaluating alternatives. It was also expressed by the PMT, TWG, and public to avoid impacts to the Section 4(f) Resources in the study area which include: Environmental Day Camp, Coal Creek Arena, and Triple Creek Trail. Aurora PROS expressed their preference to avoid bisecting other open space and recreation amenities within the study area.
 - Acres of Natural Resource Damages (NRD)/Conservation Easements/Funded areas impacted – the project area is rich with conservation easement parcels that have been purchased using GOCO and/or NRD funds (as mitigation for the Rocky Mountain Arsenal impacts). Aurora PROS, Aurora Open Space Advisory Committee, GOCO, and the public have indicated preference for alternatives that preserve conservation easements and their values. Aurora PROS specifically expressed a desire for the alternative that best met the purpose and need while preserving conservation easements purchased with special funds in the area. Impacts to high use Bald Eagle Habitat – the study area provides habitat for Bald Eagles and based on 2015 field observations have areas with particularly high usage (**Figure 12**). It has been requested by Aurora PROS, Aurora Open Space Advisory Committee, GOCO, and the public to preserve the attributes within the high use Bald Eagle areas by avoiding impacts to high use areas.
 - Potential to impact high use migratory bird habitat – Confluence Open Space is incredibly unique in that it attracts hundreds of various bird and wildlife species. As one of the largest parcels adjacent to the Triple Creek Greenway Corridor, preservation of the critical wildlife habitat and wildlife movement are a key priority of the Aurora PROS, Aurora Open Space Advisory Committee, GOCO, and the public. Those alternatives that were further away from the Confluence Open Space were preferred to those that were immediately adjacent to the Open Space.
 - Degree of constraint on wildlife movement due to the barrier effect/edge encroachment – As depicted on **Figure 12**, the northern edge of the Confluence Open Space is within a wildlife movement corridor within the region between the Rocky Mountain Wildlife Refuge and the Aurora Reservoir. This wildlife movement corridor is one of the few provided in the Region and is identified as vulnerable due to development and encroachment. Winter/Spring 2015 field observations confirmed the utilization of this area for wildlife movement. It was indicated by Aurora PROS, Arapahoe County, Aurora Open Space Advisory Committee, and the public to minimize impacts to this important wildlife movement corridor.

Figure 12 Environmentally Sensitive Areas



- Noise receptors within 500 feet – There are several sensitive noise receivers within the project area, including recreational facilities and residential units. Concern was expressed as to how the project would impact residences and wildlife and to balance the impacts between the two. In general, there was a desire to identify those receptors that may experience increased noise as part of the project. Although there were few overall receptors within the study area, it was given priority per direction of the PMT and TWG.
- Public Acceptance – public comments provided at the two public open houses and property owner meetings displayed a clear public preference for the balancing of impacts to be considered. The public indicated they desired an alternative that was the most direct and efficient connection that minimizes impacts to residences while preserving the existing parks, recreation, open space, and wildlife habitat. Meeting this objective was taken into consideration during alternative screening.

Context of Alternative Areas

After taking into account the various screening criteria that were differentiators, the context of the area surrounding each alternative was evaluated to assist with the screening process.

Alternative 1A

The following bullets provide a description for Alternative 1A which generally strived to maintain and use the existing 6th Avenue right-of-way (**Figure 8**). Overall, because Alternative 1A maintained the existing 6th Avenue right-of-way, this alternative would locate transportation facilities in an area that is primarily used for human use and away from areas with environmental sensitivities (**Figure 12**).

- Starting on the west edge, Alternative 1A ties into SH 30 and crosses Sand Creek on a structure at a skewed angle, minimizing impacts to the floodplain and providing stability for the low flow channel. The bridge span over Sand Creek crosses a narrow section of floodway/floodplain and provides accommodation for the Triple Creek Trail and wildlife passage. Impacts to migratory bird areas and Bald Eagle high use areas are minimized. Established open space areas and wetlands are impacted.
- Alternative 1A crosses the floodway/floodplain in alignment with the channel so that stream armoring would not be required and restrictions on the stream meander 'oxbow' would not be imposed. Alternative 1A would not require drastic changes to preserve the natural floodplain benefits. Because Alternative 1A is better aligned with the channel than other alternatives, grading and armoring in the vicinity of the bridge could be enough to minimize the floodplain impacts due to scour and preserve the natural floodplain benefits. This alternative does cause an increase in the surface water levels which would impact the existing structures on the Coal Creek Arena, a City of Aurora owned property. However, this alternative avoids impacts to private property structures.
- Through the central region, Alternative 1A generally follows the existing 6th Avenue roadway alignment and existing right-of-way. As Alternative 1A continues east from the bridge it passes through a privately owned, undeveloped parcel and then follows the existing 6th Avenue roadway and right-of-way into a rural residential development with large acre lots. The existing 6th Avenue right-of-way in this area is 60 feet wide. The 6th Avenue improvements would require 84 feet of additional right-of-way which requires

a substantial amount of land acquisition from residences, and one full residential relocation. Access to the residences from the 6th Avenue Parkway is challenging, as providing access to driveways from an arterial is not generally preferred due to heavy traffic at high speeds. Alternative 1A aligns well with the Picadilly Road intersection and existing 6th Avenue. Given the proximity to the residences from the roadway, noise impacts from adjacent residents would be experienced.

- As Alternative 1A continues east it transverses through undeveloped land owned by private developers providing infrastructure to accommodate accessibility to future development. The 30-inch water line follows the existing grade of 6th avenue. Since the proposed profile would need to meet arterial roadway standards, the existing 6th Avenue profile would be flattened, impacting the water line and several existing communication lines. An access connection from the existing 6th Avenue to 6th Avenue Parkway extension for residences is provided.

Residential and utility impacts are key negative differentiators for this alternative over the others as is summarized in **Table 2** and **Appendix C**.

Table 2 provides a summary of Alternative 1A and how it compares with other alternatives.

Alternative 2A

The following bullets provide a description for Alternative 2A, which generally stays near to the existing 6th Avenue right-of-way while removing the direct acquisition impacts to residences (**Figure 9**). Overall, because Alternative 2A goes to the south of the residences, the alternative would locate transportation facilities away from areas dominated for human use and away from areas with environmental sensitivities (**Figure 12**).

- Starting on the west edge, Alternative 2A ties into SH 30 and crosses Sand Creek on a structure at a skewed angle, minimizing impacts to the floodplain and providing stability of a low flow channel. The bridge span over Sand Creek crosses a narrow section of floodway/floodplain and provides accommodation for the Triple Creek Trail and wildlife passage. Impacts to migratory bird areas and Bald Eagle high use areas are minimized. Established open space areas and wetlands are impacted.
- Alternative 2A crosses the floodway/floodplain in alignment with the channel so that stream armoring would be required and restrictions on the stream meander 'oxbow' would not be imposed. Alternative 2A would not require drastic changes to preserve the natural floodplain benefits. Because Alternative 2A is better aligned with the channel than other alternatives, grading and armoring in the vicinity of the bridge could be enough to minimize the floodplain impacts due to scour and preserve the natural floodplain benefits. This alternative does cause an increase in the surface water levels which would impact the existing structures on the Coal Creek Arena, a City of Aurora owned property. However, this alternative avoids impacts to private property structures.
- Alternative 2A follows the same alignment as Alternative 1A until the west edge of the rural residential development. At this point, Alternative 2A deviates to the south of the residential development along the north edge of one large parcel of privately owned land slated for a church development. The deviation in the alignment from Alternative 1A avoids residential right-of-way and relocation. However, noise impacts to the adjacent residents would be experienced.

- Alternative 2A then connects with Picadilly Road to the south of the existing intersection with 6th Avenue. Access for residences is provided through the use of a frontage road to Picadilly Road.

As Alternative 2A continues east, it transverses through undeveloped parcels of land owned by private developers providing infrastructure to accommodate accessibility to future development. This alignment avoids impacts to the 30-inch water line and several communication lines. An access connection from the existing 6th Avenue to 6th Avenue Parkway extension for residences is provided.

Impacts to the Coal Creek Arena structures from the surface water rise is a key negative differentiator for this alternative over the others as is summarized in **Table 2** and **Appendix C**.

Table 2 provides a summary of Alternative 2A and how it compares with other alternatives.

Alternative 4A

The alignment of Alternative 4A was an attempt to make the most direct connection from SH 30 to E-470 (**Figure 10**). Alternative 4A crosses through the bald eagle use area and parallels the entire extent of the Confluence Open Space area. This alternative places transportation facilities in an area that has environmental sensitivities and ecological value (**Figure 12**).

- Alternative 4A ties into SH 30 south of the Coal Creek Arena and then trends east, bisecting several open space parcels of land that have recorded Conservation Easements established to preserve open space areas and for the future Triple Creek Greenway Corridor, which is an initiative to extend the existing Sand Creek Regional Greenway southeast to the Aurora Reservoir. Alternative 4A bisects several open space parcels, leaving remainders on either side of the roadway that would not accomplish the overall purpose of the open space.
- The crossing of Sand Creek is located just downstream of an oxbow which has higher scour potential and higher potential for Sand Creek to migrate laterally under the bridge as compared to other alternatives. It was indicated through conversations with PMT, TWG, and resource agencies that they prefer alternatives that do not cross Sand Creek at a skew within an oxbow area. Oxbows contribute to the unique river ecosystem habitat by providing spawning and nursery habitat, wetland vegetation, and a food source for adjacent bird species. Additionally, the crossing occurs within an area designated as high Bald Eagle use and would require removal of trees that have previously been used as nesting sites for Bald Eagles (**Figure 12**).
- Alternative 4A creates a greater flooding risk than other alternatives because it causes a greater rise in the water surface elevations. It also has greater impacts on the natural and beneficial floodplain values because it causes higher velocities with higher scour potential. The higher scour potential could impact the structural integrity of the bridge as well as erode beneficial floodplain overbank areas. Higher scour at the proposed bridge location means more sediment would be transported and deposited downstream which would impact downstream floodplain areas and increase downstream flooding risk.
- The measures to minimize the floodplain impacts could also have more impact to the natural and beneficial floodplain value because heavy stream bank armoring could be required which could decrease the areas where the stream would naturally meander. If

the natural stream meander is restricted, incompatible floodplain development could be encouraged because it would be expected that the stream location would be maintained and that the overbank areas could be used. The measures required to restore and preserve the natural and beneficial floodplain values for this could be significant and require realigning a portion of the stream channel, further impacting wetlands, riparian habitat, and stream integrity.

- The alternative is directly adjacent to and would negatively impact the Confluence Open Space, which provides habitat and refuge for migratory birds and serves as a wildlife riparian zone. The Confluence Open Space provides habitat unique to the region for migratory bird species because it literally is the confluence of three waterways (Sand Creek, Murphy Creek, and Coal Creek). The confluence of these three waterways creates a highly unique riparian area providing food, forage, and breeding grounds for migratory birds. Confluence Open Space contains a series of manmade ponds ringed by wetlands and cottonwood trees within the Sand Creek corridor. It provides a diverse habitat with food, shelter, breeding ground, and migration corridors for several wildlife species, including white-tailed and mule deer, coyote, and numerous bird species. Development on or near the property would lead to or contribute to degradation of the scenic and natural character of the area. As one of the large parcels adjacent to the Triple Creek Greenway Corridor, preservation will continue to provide critical wildlife habitat and add to an important corridor for wildlife movement.
- The crossing of Picadilly Road would require a substantial elevation increase of Picadilly Road to bring it up to match 6th Avenue profile. There are two residences along Picadilly Road that would have relocated access to their properties.
- The eastern portion of Alignment 4A transects through several undeveloped parcels of land owned by private developers. Access to these parcels provides the transportation infrastructure need to access these parcels for future development. An access connection from the existing 6th Avenue to 6th Avenue Parkway extension for residences is provided.

Both biological resources and floodway/floodplain impacts are key negative differentiators for this alternative compared to other alternatives as summarized in **Table 2** and **Appendix C**.

Table 2 provides a summary of Alternative 4A and how it compares with other alternatives.

Alternative 4B

The following bullets provide a description for Alternative 4B (**Figure 11**). Overall, because Alternative 4B goes through conservation easements, wildlife habitat, and floodplains the alternative was defined as providing transportation facilities in an environmentally sensitive area (**Figure 12**).

- For Alternative 4B, the context of the area is generally similar to that of Alternatives 1A and 2A on the west end. It shares the same structure alignment over Sand Creek.
- After crossing Sand Creek the alignment shifts to the south, avoiding residential impacts along existing 6th Avenue. The alternative bisects several large parcels of land that have Conservation Easements established through Arapahoe County and City of Aurora. The

alignment parallels an area characterized as Bald Eagle high use area and wildlife migration corridors.

- The middle of the alignment crosses through a wide portion of floodplain resulting in a greater than one-foot rise in surface water on private property. Alternative 4B crosses the floodway/floodplain in alignment with the channel so that stream armoring would not be required and restrictions on the stream meander 'oxbow' would not be imposed. Alternative 4B would not require drastic changes to preserve the natural floodplain benefits. Because Alternative 4B is better aligned with the channel than other alternatives, grading and armoring in the vicinity of the bridge could be enough to minimize the floodplain impacts due to scour and preserve the natural floodplain benefits. This alternative does cause an increase in the surface water levels which would impact the existing structures on the Coal Creek Arena, a City of Aurora owned property. However, this alternative avoids impacts to private property structures. The alternative is directly adjacent to and would negatively impact the Confluence Open Space, which provides habitat and refuge for migratory birds and serves as a wildlife riparian zone. Confluence Open Space contains a series of manmade ponds ringed by wetlands and cottonwood trees within the Sand Creek corridor. It provides a diverse habitat with food, shelter, breeding ground, and migration corridors for several wildlife species, including white-tailed and mule deer, coyote, and numerous bird species. Development on or near the property would lead to or contribute to degradation of the scenic and natural character of the area. As one of the large parcels in the Triple Creek Greenway Corridor, preservation will continue to provide critical wildlife habitat and add to an important corridor for wildlife movement.
- The crossing of Picadilly Road would require a substantial elevation increase of Picadilly Road to bring it up to match 6th Avenue profile. There are two residences along Picadilly Road that would have relocated access to their properties.
- As Alternative 4B continues east, it transverses through undeveloped parcels of land owned by private developers providing infrastructure to accommodate accessibility to future development. An access connection from the existing 6th Avenue to 6th Avenue Parkway extension for residences is provided.

Residential, biological resources, and floodway/floodplain impacts are key negative differentiators for this alternative compared to other alternatives and is summarized in **Table 2** and **Appendix C**.

A detailed evaluation matrix of the Level 2 analysis is provided in **Appendix C**. A summary of the results based on differentiator criteria during the Level 2 screening is provided below (**Table 2**):

Table 2 Differentiating Criterion for Level 2 Screening

Criterion	Alternative 1A	Alternative 2A	Alternative 4A	Alternative 4B
Utilities	↓	↑	↑	↑
Residential Impacts (access, right-of-way, acquisition, noise)	↓↓	↓	↓	↓↓
Biological resources (high use Bald Eagle habitat, migratory bird habitat, wildlife migration corridors, conservation easements)	↑	↑	↓↓	↓
Floodway/floodplain Impacts	↓	↓	↓↓	↓↓
Section 4(f) Properties	↓	↓	↑	↓
Summary	This alternative was screened out overall because of its impacts to utilities and residential properties.	Although some impacts do exist, this alternative was carried forward to analysis because of its ability to best balance residential, floodplain/floodway, and biological impacts.	This alternative was screened out due to its major impacts to biological resources, and floodway/floodplain, as well as residential impacts	This alternative was screened out because of its major impacts to biological resources. and floodway/floodplain, as well as residential impacts.

Legend: ↑= indicates negligible impacts; ↓= indicates a negative impact; ↓↓= indicates a severe negative impact

As is demonstrated in **Table 2** and **Appendix C**, several alternatives had more impacts within the differentiation criteria requirements identified by the PMT, TWG, and the public. Minimizing impacts is the primary goal in reaching a Proposed Action while balancing impacts between the built and natural environment. This table illustrates the reason to advance Alternative 2A as the Proposed Action. Alternatives 1A, 4A, and 4B did not meet several criteria that were considered to be acceptable by the TWG, PMT, or the public either because of the degree of the impact, or lack of opportunity to meaningfully mitigate impacts, such as those to residential properties, and parks recreation and open space properties, for these reasons, these alternatives were eliminated.

Based on the thorough screening processes, Alternative 2A is recommended as the Proposed Action to be evaluated in detail with the No Action Alternative in the EA. In summary, Alternative 2A is recommended for the following reasons:

- Residential access to existing properties off of existing 6th Avenue can be provided in a manner acceptable to the City of Aurora and Arapahoe County.
- Avoidance and/or minimal impacts to the major water line are accomplished per the City of Aurora Public Works Department request.
- No residential relocations are required, which was a strong desire expressed at public open houses and by both the City of Aurora and Arapahoe County.
- While there are floodway impacts to structures, the structures are owned by the City of Aurora, impacts to private property owners are avoided. UDFCD expressed support for Alternative 2A for these particular reasons. Additionally, City of Aurora Public Works Department preferred to impact structures owned by the City instead of private property. Arapahoe County preferred Alternative 2A because it avoids floodplain impacts to private properties located within their jurisdiction.
- Impacts to parcels, and remnants, with established conservation easements or that have been purchased using NRD funds or GOCO funds are minimized, which was highly desirable by the City of Aurora PROS, Arapahoe County, GOCO, and public comment from public open houses. City of Aurora PROS specifically called out Alternative 2A as one that best minimized impacts to PROS properties while still meeting the project purpose and need.
- The unique wildlife habitat and the natural environment in the area, including the Confluence Open Space, are impacted less than comparable alternatives which was a goal communicated at both public open houses and by members of the TWG and PMT.

Alternative 2A and the No Action Alternative are presented in further detail in the remainder of this technical report.

5. NO ACTION ALTERNATIVE

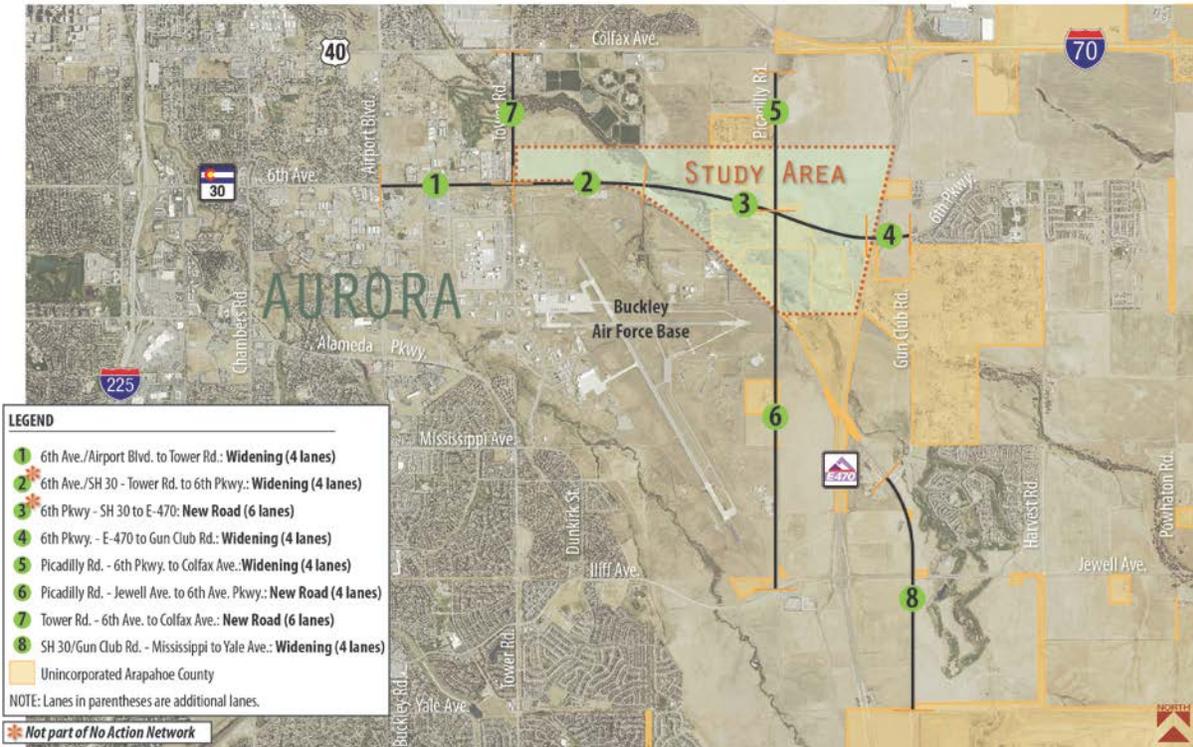
The No Action Alternative would not provide any improvements beyond the existing and committed transportation system. The No Action Alternative is the alternative that would be selected if the lead agency, FHWA, chooses not to select the Proposed Action. The No Action Alternative does not meet the purpose and need, but is carried forward as a baseline against which the Proposed Action is compared. The No Action Alternative includes safety and maintenance activities that are required to sustain an operational transportation system or facility.

For the purpose of travel demand forecasting and identifying resource impacts that are directly related to traffic volume, such as air quality and noise, transportation projects currently planned in the vicinity of the project are included with the No Action Alternative. These other transportation improvement projects have committed or identified funds for construction and will be built regardless of whether or not any other improvements are made. Travel demand forecasting predicts traffic conditions that are expected to occur on the transportation system in the design year 2035. The traffic analysis is further discussed in the Traffic Analysis Report (FHU, 2015), which will serve as an appendix to the EA.

The other separate committed projects included in the travel demand forecasting for the No Action Alternative include projects proposed by the following entities (**Figure 13**):

- City of Aurora
- E-470
- Arapahoe County
- CDOT
- Buckley AFB

Figure 13 No Action Alternative

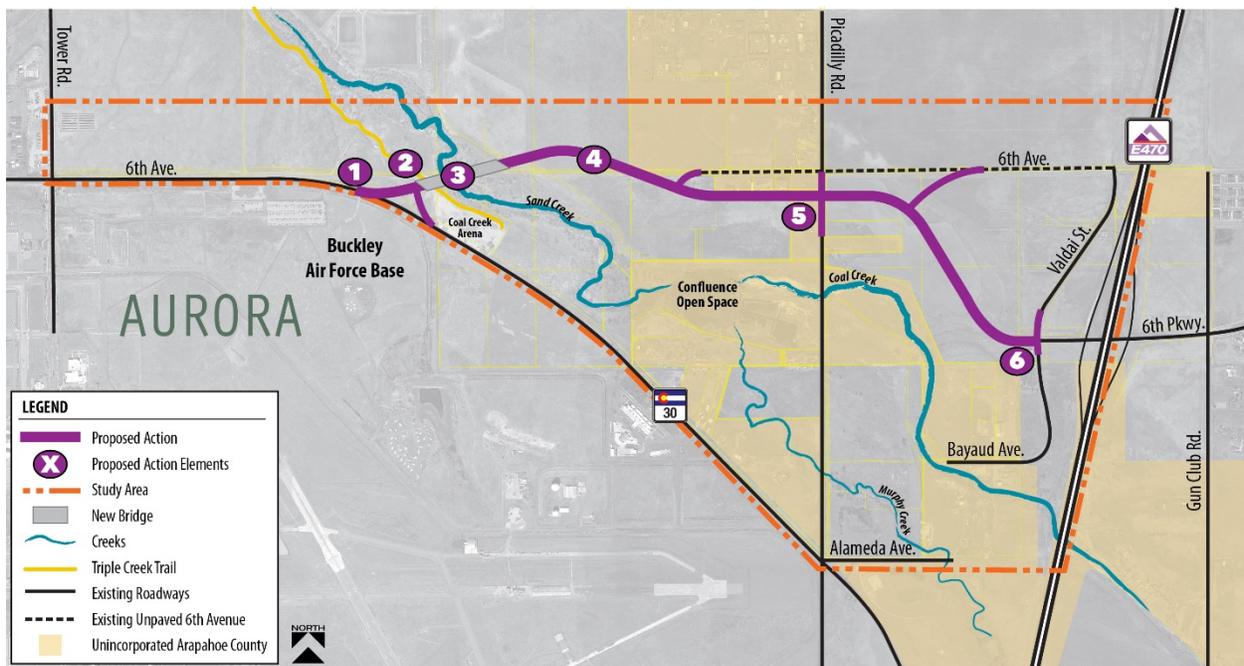


6. PROPOSED ACTION

As depicted on **Figure 14**, the Proposed Action would close a gap in the existing major arterial street system in the eastern portion of Aurora. **Figure 14** presents the project elements of the Proposed Action, as discussed below. The Proposed Action is located in the eastern portion of Aurora, Colorado and is located partially within Aurora and partially within unincorporated Arapahoe County.

The Proposed Action (Alternative 2A from Level 2 screening) consists of the following elements:

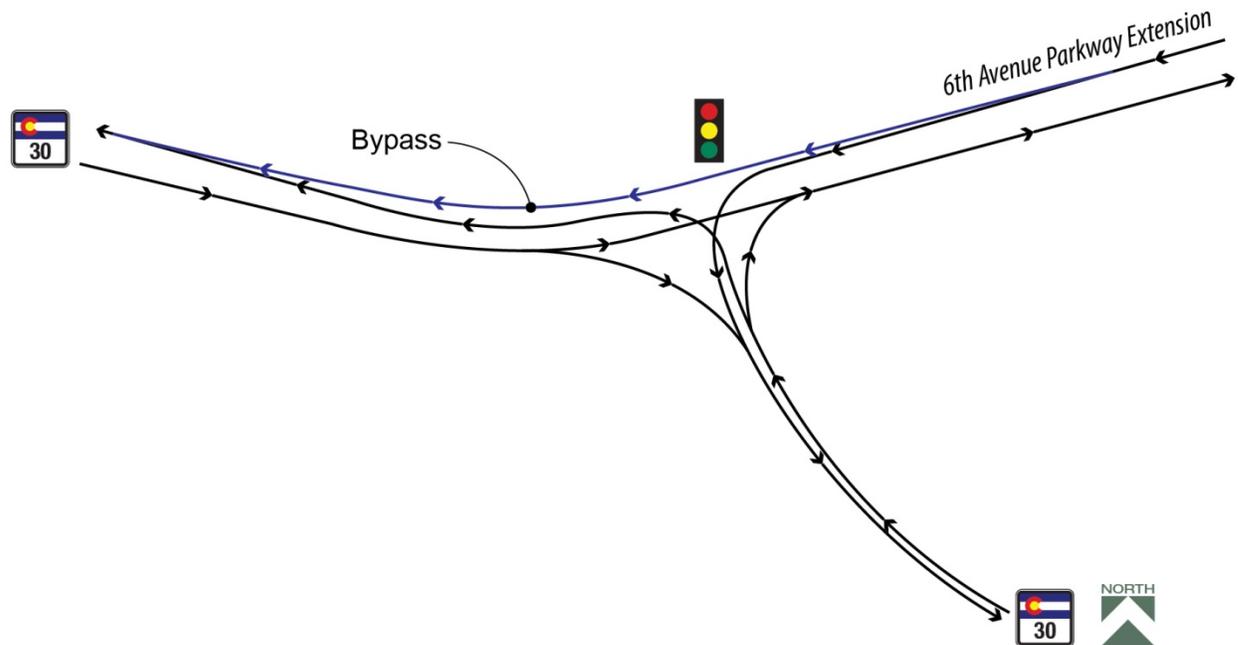
Figure 14 Proposed Action



Note: Numbers in graphic correspond with text below.

Element 1: Tie into existing 6th Avenue/SH 30: SH 30/6th Avenue is a two-lane arterial owned by CDOT. SH 30/6th Avenue provides access to the main gate of Buckley AFB. The 6th Avenue Parkway extension would tie into a three-legged intersection at SH 30. The intersection configuration (**Figure 15**) would be signalized with bypass lanes for the eastbound SH 30 through movement or a thru-tee signalized intersection with bypass lanes for both the eastbound SH 30 through movement. The tie-in would be an urban curb and gutter section with three 12-foot travel lanes in each direction to connect to future 6-lane section to the west. A 10-foot sidewalk would be located on both the north and south sides.

Figure 15 Thru-Tee Intersection



Element 2: Triple Creek Trail realignment and connections: The regional Triple Creek Greenway Corridor and Trail that serves equestrians, bicyclists, and pedestrians currently ends in the project area at the Coal Creek Arena. The existing trail would cross beneath the new bridge over Sand Creek and provide additional access to recreational uses in the project area. The bridge over Sand Creek would provide for future trail connections to the regional trail. A 10-foot sidewalk on both sides of the bridge (Element 3) would provide connections to the trail.

Element 3: Roadway Bridge over Sand Creek: Immediately east of the intersection of SH 30 and 6th Avenue Parkway, the roadway would elevate to cross over Sand Creek and the floodway/floodplain on a six-lane bridge with multiuse accommodations. The bridge length and profile would be set to minimize impacts to Sand Creek, while still providing a minimum 10-foot vertical clearance over the Triple Creek Trail. The bridge would have a median and sidewalks. The bridge would be approximately 680 feet in length with 5 variable length spans supported on four piers. The structure would blend with the surrounding natural environment and provide habitat connectivity for wildlife passage along the Triple Creek Greenway Corridor.

Element 4: 6th Avenue Parkway arterial roadway: The Proposed Action would traverse through several undeveloped parcels and south of several residences. The roadway will continue east as an urban curb and gutter six-lane section with raised vegetated median and a 10-foot sidewalk on the north and south side. The study area contains 6th Avenue in three disconnected pieces as shown in **Figure 14**: 1) SH 30, also known as 6th Avenue, currently intersects with Tower Road and then heads to the southeast, crossing over E-470, eventually intersecting with Gun Club Road. 2) From Picadilly Road, a portion of 6th Avenue

is present that intersects and extends east and west from Picadilly Road, providing access to local residences. 3) The eastern edge of the project area is bordered by the E-470 Toll Road and the E-470 interchange with 6th Avenue Parkway that extends east from E-470, providing access to numerous residential subdivisions to the east.

Element 5: Intersection with Picadilly Road: The 6th Avenue Parkway extension would intersect with Picadilly Road, a north-south road in the project area. The Picadilly Road approach to the intersection would be signal controlled, and the intersection would include turn lanes providing access to existing and future development.

Element 6: Tie into existing 6th Avenue Parkway at E-470: The existing E-470 interchange with 6th Avenue Parkway truncates and does not provide a complete connection. The 6th Avenue Parkway extension would tie into the existing interchange providing the full connection east to existing 6th Avenue Parkway and connecting to the existing 6-lane section to the east of Gun Club Road.

In addition to these transportation elements, the Proposed Action would include permanent roadway stormwater drainage with water quality features for roadway runoff and accommodate offsite stormwater flows. Details of drainage and water quality features are presented in **Appendix A6 Floodplains and Drainage**.

The Proposed Action is the alternative being carried forward for analysis in the EA, along with the No Action Alternative. This document serves as a foundational document for the EA.

7. REFERENCES

City of Aurora. 1986. Comprehensive Plan.

City of Aurora 2009 Comprehensive Plan. 2009a. City of Aurora. E-470 Strategic Area.
<https://www.auroragov.org/cs/groups/public/documents/document/002603.pdf>

City of Aurora 2009 Comprehensive Plan. 2009b. City of Aurora. Buckley AFB Strategic Area.
<https://www.auroragov.org/cs/groups/public/documents/document/002599.pdf>

City of Aurora 2012. Bicycle and Pedestrian Master Plan. City of Aurora.
<https://www.auroragov.org/cs/groups/public/documents/document/015491.pdf>

City of Aurora. 2011. Triple Creek Greenway Corridor Study. City of Aurora Parks, Recreation, and Open Space Department, Planning, Design and Construction Division.

Denver Regional Council of Governments (DRCOG) 2015. 2040 Fiscally Regionally Constrained Transportation Plan.
<https://drcog.org/sites/drcog/files/resources/2040%20Fiscally%20Constrained%20Regional%20Transportation%20Plan.pdf>

Nolte and Associates, Inc. 1996. *Preliminary Alignment Study East 6th Avenue, From State Highway 30 to 3000' East of Gun Club Road*. April 1996 Revised March 1997.

Nolte and Associates, Inc. 1997. *Conceptual Phase II Alignment Study East 6th Avenue, From State Highway 30 to 3000' East of Gun Club Road*. December 1997 Revised July 1998.

Trust for Public Land 2015. *Work Continues on Aurora's Triple Creek Greenway Project*.
<https://www.tpl.org/media-room/work-continues-auroras-triple-creek-greenway-project>

Appendix A – Level 1a Screening Table

Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension

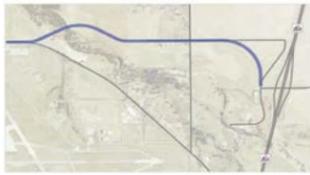
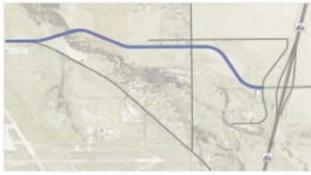
Level 1a - No Action and Alternative Alignments - Purpose and Need Screening Matrix

		Alternative Alignments						
		NA	1	2	3	4	5	6
		No Action						
Needs								
Does the alignment provide an efficient transportation link in the Aurora arterial system?	Will it provide an additional connection to get from the east side to the west side of Aurora in less time?	NO	MAYBE	YES	YES	YES	YES	MAYBE
		No, there are no changes in the alignment and therefore does not close the gap.	Although this alignment does link 6th Ave (SH 30) to E-470, it is indirect.	This alignment does close the gap and provide an efficient link between 6th Ave (SH 30) and E-470.	This alignment does close the gap and provide an efficient link between 6th Ave (SH 30) and E-470.	This alignment does close the gap and provide an efficient link between 6th Ave (SH 30) and E-470.	This alignment does close the gap and provide an efficient link between 6th Ave (SH 30) and E-470.	Although this alignment does link 6th Ave (SH 30) to E-470, it is indirect.
Does the alignment reduce travel time and vehicle miles traveled for motorists and emergency vehicles?	Is there a decrease in distance from the intersection of Tower Road/6th Avenue to the intersection of E-470/Jewell Ave as traveled along 6th Ave (SH 30) to the southeast?	NO	MAYBE	YES	YES	YES	YES	MAYBE
		No, there are no changes in the alignment and therefore does not reduce travel time of vehicle miles traveled.	Although this alignment does reduce the distance between 6th Ave (SH 30) to E-470 compared to current conditions, it is indirect and requires a stop condition intersection at Valdai Street.	This alignment does reduce travel time and vehicle miles traveled compared to existing conditions.	This alignment does reduce travel time and vehicle miles traveled compared to existing conditions.	This alignment does reduce travel time and vehicle miles traveled compared to existing conditions.	This alignment does reduce travel time and vehicle miles traveled compared to existing conditions.	Although this alignment does reduce the distance between 6th Ave (SH 30) to E-470 compared to current conditions, it is indirect and requires a stop condition intersection at Valdai Street.
Does the alignment enhance and support existing and future multimodal connectivity?	Will the corridor be multimodal, which is defined to include existing and planned recreational facilities as well as sidewalks, trails, future bus transit and vehicles?	NO	YES	YES	YES	YES	YES	YES
		The existing roadway corridor provides for vehicular travel only.	The alignment can be developed to accommodate different modes of travel including planned and future trails.	The alignment can be developed to accommodate different modes of travel including planned and future trails.	The alignment can be developed to accommodate different modes of travel including planned and future trails.	The alignment can be developed to accommodate different modes of travel including planned and future trails.	The alignment can be developed to accommodate different modes of travel including planned and future trails.	The alignment can be developed to accommodate different modes of travel including planned and future trails.
Does the alignment provide transportation infrastructure needed to support planned development?	The land use and development trends within the corridor will result in additional demands on the transportation system. Providing access and maximizing travel ability to, through, and within the corridor are critical to supporting planned development. This includes maintaining and enhancing connections between major activity centers near the corridor. Does this alternative address these needs?	NO	YES	YES	YES	YES	YES	MAYBE
		No, there are no changes in the alignment and therefore does not support planned development.	The alignment could provide access to future planned development and activity centers as it does pass adjacent to vacant property and past planned development parcels.	The alignment could provide access to future planned development and activity centers as it does pass adjacent to vacant property and past planned development parcels.	The alignment could provide access to future planned development and activity centers as it does pass adjacent to vacant property and past planned development parcels.	The alignment could provide access to future planned development and activity centers as it does pass adjacent to vacant property and past planned development parcels.	The alignment could provide access to future planned development and activity centers as it does pass adjacent to vacant property and past planned development parcels.	This alignment provides minimal access to planned development and activity centers.
Summary of Results		Retained: For comparison purposes.	Retained: The alignment does provide a connection that is currently not provided reducing travel time and vehicle miles traveled, although it is more indirect and does requires a stop condition intersection. It can accommodate different modes of travel and will promote access to future planned development.	Retained: The alignment does provide a connection that is currently not provided reducing travel time and vehicle miles traveled. It can accommodate different modes of travel and will promote access to future planned development.	Retained: The alignment does provide a connection that is currently not provided reducing travel time and vehicle miles traveled. It can accommodate different modes of travel and will promote access to future planned development.	Retained: The alignment does provide a connection that is currently not provided reducing travel time and vehicle miles traveled. It can accommodate different modes of travel and will promote access to future planned development.	Retained: The alignment does provide a connection that is currently not provided reducing travel time and vehicle miles traveled. It can accommodate different modes of travel and will promote access to future planned development.	Retained: The alignment does provide a connection that is currently not provided reducing travel time and vehicle miles traveled, although it is more indirect and does requires a stop condition intersection. It can accommodate different modes of travel. However, it is south of future planned development areas needing access.

Appendix B – Level 1b Screening Table

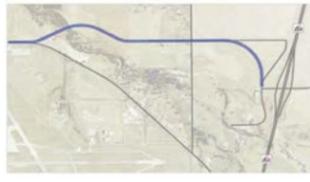
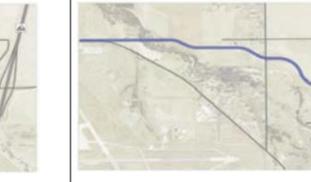
Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension

Final Level 1b - No Action and Alternative Alignments - Qualitative Goals Screening Matrix

Goals	NA	1	2	3	4	5	6
	No Action						
							
Recommendations	For Comparison Purposes	Recommend Advancing to Level 2 Screening as a hybrid with Alt. 2 called Alt. 1A	Recommend Advancing to Level 2 Screening with refinements called Alt. 2A	Not Recommended - Eliminate from Further Consideration	Recommend Advancing to Level 2 Screening with Refinements called 4A and as a hybrid with Alt. 2 called Alt. 4B	Not Recommended - Eliminate from Further Consideration	Not Recommended - Eliminate from Further Consideration
Hybrid Opportunities Exist	n/a	Yes - West portion of alignment may provide hybrid potential due to minimal floodway crossing and minimal impacts to the TCGC	Yes - West portion of alignment may provide hybrid potential due to minimal floodway crossing and minimal impacts to the TCGC	Yes - East portion of alignment may provide hybrid potential due to direct connection to 6th Pkwy. and redevelopment potential	Yes - East portion of alignment may provide hybrid potential due to direct connection to Valdai St. and redevelopment potential	No	No
Improve Transportation Operations and Mobility	Adds substantial delay to motorists and life/safety response due to increased congestion with increased traffic	Adds delay to motorists and life/safety response due to "T" Intersection at 6th Pkwy.	Reduces delay to motorists and life/safety response due to direct connection at 6th Pkwy.	Reduces delay to motorists and life/safety response due to direct connection at 6th Pkwy.	Reduces delay to motorists and life/safety response due to direct connection at 6th Pkwy.	Reduces delay to motorists and life/safety response due to direct connection at 6th Pkwy.	Adds delay to motorists and life/safety response due to a complex intersection at Picadilly Rd. and due to "T" Intersection at 6th Pkwy.
Avoid and Minimize Adverse Impacts to Adjacent Roadway Facilities	Avoids adverse impacts to the roadway facility by no action or improvements	Requires improvements at the intersections of SH 30, Picadilly Rd., Valdai St./6th Pkwy.	Requires improvements at the intersections of SH 30, Picadilly Rd., Valdai St./6th Pkwy. The distance between the 6th Avenue crossing of Picadilly and 6th Avenue Parkway Ext crossing is less than 300 feet and would require modifications for the 6th Avenue intersection.	Requires improvements at the intersections of SH 30, Picadilly Rd., Valdai St./6th Pkwy.	Requires improvements at the intersections of SH 30, Picadilly Rd., Valdai St./6th Pkwy.	Requires substantial improvements to Picadilly Rd. due to the floodway and requires improvements at the intersections of SH 30 and Valdai St./6th Pkwy.	Requires improvements at the intersections of SH 30, Picadilly Rd., Alameda Ave., and Valdai St./6th Pkwy.
Enhance Local Access and Circulation	Does not enhance local access or circulation	Provides additional access and circulation for some properties along the alignment	Provides additional access and circulation for properties along the alignment	Provides additional access and circulation for properties along the alignment	Provides additional access and circulation for properties along the alignment	Limits access to properties along the alignment since most of the alignment will be on bridge structure	Provides additional access and circulation for properties along the alignment
Provide Transportation Infrastructure that Does Not Preclude Planned Development	Does not provide transportation infrastructure for planned development	Does provide transportation infrastructure for planned development	Does provide transportation infrastructure for planned development	Does provide transportation infrastructure for planned development	Does provide transportation infrastructure for planned development	Does not provide transportation infrastructure for planned development areas	Limits transportation infrastructure for areas planned for development
Minimize Maintenance and Operational Requirements for Drainageway Crossings	No bridge crossings	At least one structure required to cross Sand Creek. Requires shortest bridge opening because this crosses Sand Creek with the least amount of skew.	At least one structure required to cross Sand Creek. Requires slightly longer bridge opening than Alternative 1 because of the alignment's skew to Sand Creek.	At least one structure required to cross Sand Creek. May require largest bridge opening because of alignment's skew to Sand Creek.	At least one structure required to cross Sand Creek. May require largest bridge opening because of alignment's skew to Sand Creek.	At least two structures required to cross Murphy Creek and Coal Creek.	At least two structures required to cross Murphy Creek and Coal Creek.
Avoid and Minimize Residential, Commercial, and Other Property Impacts	Avoids impacts to properties	Impacts more than 12 properties, and leaves undevelopable remainders	Impacts more than five properties, requires no relocation, and leaves minimal undevelopable remainders	Impacts more than five properties, requires relocation, and leaves some undevelopable remainders	Impacts less than five properties, requires no relocation, and leaves minimal undevelopable remainders	Impacts less than five properties, requires relocation, and leaves undevelopable remainders	Impacts more than 12 properties, requires relocation, and leaves undevelopable remainders

Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension

Final Level 1b - No Action and Alternative Alignments - Qualitative Goals Screening Matrix

		NA	1	2	3	4	5	6
		No Action						
Goals								
Recommendations		For Comparison Purposes	Recommend Advancing to Level 2 Screening as a hybrid with Alt. 2 called Alt. 1A	Recommend Advancing to Level 2 Screening with refinements called Alt. 2A	Not Recommended - Eliminate from Further Consideration	Recommend Advancing to Level 2 Screening with Refinements called 4A and as a hybrid with Alt. 2 called Alt. 4B	Not Recommended - Eliminate from Further Consideration	Not Recommended - Eliminate from Further Consideration
Avoid and Minimize Impacts to Floodways and Floodplains		Avoids impacts to the floodway and floodplain	Only impacts Sand Creek floodplain and floodway. Least amount of roadway located in floodway and floodplain. Potential to impact floodway/floodplain delineation on two properties in addition to COA property.	Only impacts Sand Creek floodplain and floodway. Minimized amount of roadway located in floodplain and floodway. Potential to impact floodway/floodplain delineation on three properties in addition to COA property.	Impacts Sand Creek floodway and floodplain, and Coal Creek floodplain. Substantial amount of roadway located in floodway and floodplain. Potential to impact floodway/floodplain delineation on four properties in addition to COA property.	Impacts Sand Creek and Coal Creek floodplains and floodways. Substantial amount of roadway located in Sand Creek floodway and floodplain, moderate amount of roadway located in Coal Creek floodway and floodplain. Potential to impact floodway/floodplain delineation on six properties in addition to COA property. Potential to impact at least one insurable structure.	Impacts Murphy Creek and Coal Creek floodplains and floodways. Substantial amount of roadway located in floodways and floodplains. Potential to impact floodway/floodplain delineation on at least six properties in addition to COA property. Potential to impact five or more insurable structures.	Impacts Murphy Creek and Coal Creek floodplains and floodways. Substantial amount of roadway located in Murphy Creek floodway and floodplain, moderate amount of roadway located in Coal Creek floodway and floodplain. Potential to impact floodway/floodplain delineation on at least two properties in addition to COA property. Potential to impact at least one insurable structure.
Avoid and Minimize Environmental Impacts	Triple Creek Greenway Corridor (TCGC)²	Avoids impacts to the TCGC	Minimizes impacts to the TCGC due to crossing the creek at the narrow section	Minimizes impacts to the TCGC due to crossing the creek at the narrow section	Substantial potential impacts to the TCGC due to crossing the creek at a skew to align with the existing 6th Ave.	Potential impacts to the TCGC due to crossing the creek at a fairly wide section impacts to bald eagle habitat	Substantial impacts to the TCGC due to crossing the creek at a very wide section	Potential impacts to the TCGC due to two creek crossings
	4(f) Recreational Properties	Avoids impacts to 4(f) properties	Impacts to 4(f) properties	Impacts to 4(f) properties	Impacts to 4(f) properties	Impacts to 4(f) properties	Impacts to 4(f) properties	Impacts to 4(f) properties
	Noise	Minimizes possible new impacts to sensitive residential receivers.	Higher potential for impacts to residential receivers. May need to mitigate impacts to sensitive residential and trail receivers.	Higher potential for impacts to residential receivers. May need to mitigate impacts to sensitive residential and trail receivers.	Higher potential for impacts to residential receivers. May need to mitigate impacts to sensitive residential and trail receivers.	Lower potential for impacts to residential receivers. May need to mitigate impacts to sensitive residential and trail receivers.	Lower potential for impacts to residential receivers. May need to mitigate impacts to sensitive residential and trail receivers.	Higher potential for impacts to residential receivers. May need to mitigate impacts to sensitive residential and trail receivers.

Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension

Final Level 1b - No Action and Alternative Alignments - Qualitative Goals Screening Matrix

	NA	1	2	3	4	5	6
	No Action						
Summary of Results	Retained: For Comparison Purposes	Retained: Recommend Advancing to Level 2 Screening as a hybrid with Alt. 2 called Alt. 1A	Retained: Recommend Advancing to Level 2 Screening with refinements called Alt. 2A	Eliminated: Not Recommended - Eliminate from Further Consideration	Retained: Recommend Advancing to Level 2 Screening with Refinements called 4A and as a hybrid with Alt. 2 called Alt. 4B	Eliminated: Not Recommended - Eliminate from Further Consideration	Eliminated: Not Recommended - Eliminate from Further Consideration
	<p>Alt. 1A: This alignment minimizes impacts to the floodway and floodplain and associated environmental impacts. Although the alignment impacts conservation easements this can be minimized with alignment refinements. This alignment would provide transportation infrastructure that supports future planned development. Although this alignment intersect 6th Parkway and Valdai at a "T" intersection, this can be addressed with creating a hybrid with Alt. 2 to improve traffic operations of this alternative. For these reasons, this alignment is recommended with the appropriate refinements by creating a hybrid of this alternative with Alt. 2.</p> 	<p>Alt. 2A: This alignment provides direct access from SH 30 to E-470 minimizing delay. This alignment minimizes impacts to the floodway and floodplain and associated environmental impacts. Although the alignment impacts conservation easements this can be minimized with alignment refinements. This alignment would provide transportation infrastructure that supports future planned development. For these reasons, this alignment is recommended with the appropriate refinements creating a hybrid of the original Alt. 2.</p> 	<p>The alignment crosses a large expanse of the existing floodway and floodplain that would be very difficult to mitigate and could impact floodway/floodplain delineation on four properties in addition to COA property. The ecological impacts of this alignment having one of the largest bridge openings due to alignment's skew with Sand Creek is substantial compared to other alternatives. The alignment would bisect several properties increasing the potential for undevelopable remainders. For these reasons, this alignment is not recommended and has been eliminated.</p>	<p>Alt. 4A: This alignment provides the most direct access from SH 30 to E-470 compared to other alternatives minimizing delay. This alignment could be refined to minimize impacts to the floodway and floodplain and associated environmental impacts. This alignment could be refined to avoid impacts to conservation easements. This alignment has the least potential of property impacts. For these reasons, this alignment is recommended with the appropriate refinements creating a hybrid of the original Alt. 4. This alignment would provide transportation infrastructure that supports future planned development</p> 	<p>The alignment crosses a large expanse of the existing floodway and floodplain that would be very difficult to mitigate and could impact a number of downstream insurable structures. The ecological impacts of crossing the two streams and constructing bridge piers in the streams are substantial compared to other alternatives. The alignment crosses directly through properties and residential and commercial structures requiring potentially total takes. The alignment would limit access to adjacent properties because the roadway would be elevated above existing ground. This also creates issues with the intersection of Picadilly that would need substantial reconstruction or grade separation. For these reasons, this alignment is not recommended and has been eliminated.</p>	<p>The alignment provides proportionately out-of-direction travel for the motorist and intersects at a "T" at the Valdai intersection, which adds a substantial amount of delay compared to other alternatives. The alignment also has two creek crossings and impacts associated floodways and floodplains. For these reasons, this alignment is not recommended and has been eliminated.</p>	
					<p>Alt. 4B: To address the close proximity of this roadway intersection with Picadilly and the 6th Avenue intersection with Picadilly, a hybrid of Alt. 2 (west side) and Alt. 4 (east side) would provide a greater intersection distance minimizing impacts to the existing 6th Avenue intersection. For these reasons and those noted above, this alignment is recommended with the appropriate refinements noted above to the west and creating a hybrid of this alternative with Alt. 4 to the east.</p> 		

¹ Buckley refers to the Buckley Air Force Base

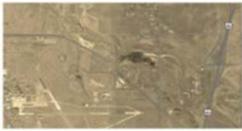
² TCGC includes the ecosystem elements associated with the existing creeks/streams within the corridor such as: wetlands, migratory bird habitat, wildlife corridors, and recreation opportunities.

Appendix C – Level 2 Screening Table

**Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension
Level 2 - No Action and Alternative Alignments - Quantitative Screening Matrix**

Criteria			Alternative Alignments				
			NA	1A	2A	4A	4B
			No Action				
							
For Comparison Purposes			A hybrid of Alt. 1 with Alt. 2	Refinement of Alt. 2	Refinement of Alt. 4	A hybrid of Alt. 4 with Alt. 2	
Improve Transportation Operations and Mobility	What is the travel time/emergency response time savings between I-225 and the 6th Avenue Parkway Extension and Gun Club Road intersection for this alternative over the No Action (minutes)?	travel time will remain unchanged from existing conditions and may worsen with increased traffic	7 minutes. This was based on the current route between these end points based on average speed for the no action compared to this alternative.	7 minutes. This was based on the current route between these end points based on average speed for the no action compared to this alternative.	7 minutes. This was based on the current route between these end points based on average speed for the no action compared to this alternative.	7 minutes. This was based on the current route between these end points based on average speed for the no action compared to this alternative.	
	What is the level of service [LOS] for 2035 traffic volumes for the intersection of SH 30 and 6th Avenue Parkway Extension for this alternative (A, B, C, D, F)?	would not provide east-west connection, and thus would result in continued out of direction travel	LOS C	LOS C	LOS C	LOS C	
	How much does the existing SH 30 need to be reconstructed due to this alternative (linear feet of improvements)?	no reconstruction necessary	2257'-horizontal tie back to existing controls (profile does not control)	2257'-horizontal tie back to existing controls (profile does not control)	1887'-horizontal tie back to existing controls (profile does not control)	2257'-horizontal tie back to existing controls (profile does not control)	
Avoid or Minimize Adverse Impacts to Adjacent Roadway Facilities	How much does the existing Picadilly Road need to be reconstructed due to this alternative (linear feet of improvements)?	no reconstruction necessary	2199'- horizontal tie back to existing controls to the south, profile tie back to existing controls to the north	1672'- horizontal tie back to existing controls to the south, profile tie back to existing controls to the north	3197'-profile tie back to existing controls to the south, horizontal tie back to existing controls to the north	3197'-profile tie back to existing controls to the south, horizontal tie back to existing controls to the north	
	How much does the existing Valdai Street need to be reconstructed due to this alternative (linear feet of improvements)?	no reconstruction necessary	601 feet reconstructed	601 feet reconstructed	601 feet reconstructed	601 feet reconstructed	
Balance of Regional Travel and Local Access	How many existing residential property accesses are impacted by this alternative (#)?	no residential properties are impacted	9 residential property accesses are impacted due to permanent change/relocation of access.	3 residential property accesses with partial movement impacts. Only partial movement access impacts and not relocation of access points.	3 residential property accesses are impacted due to permanent changes/relocation of access. Potential permanent impacted due to distance from driveway and intersection of Picadilly and 6th Avenue.	3 residential property accesses are impacted due to permanent change/relocation of access.	
	Is access provided from both the eastbound and westbound sides of this alternative from existing properties (Yes or No)? If yes, how many undeveloped parcels have access from both sides of the alternative (#)?	n/a for this alternative. Undeveloped parcels without access would remain without access.	Yes. 1. Access is provided from both sides of this alternative through most of Parcel 104.	Yes. 1. Access is provided from both sides of this alternative.	Yes. 1. Access is provided from both sides of this alternative.	Yes. 1. Access is provided from both sides of this alternative.	
	Is future signalized intersection spacing impacted with this alternative requiring new connections (Yes or No)?	n/a for this alternative.	No; there is sufficient distance from Tower Road based on CDOT access criteria for Category R-A (minimum of 0.5 mile). The spacing between the signalized intersections of Picadilly Road and Valdai Street is greater than 0.5 mile. Matches the existing intersections at Valdai Street and the E-470 west ramps. Spacing between Valdai and E-470 west ramp signalized intersections is greater than 600 feet. Both intersections exceed City of Aurora criteria for signalized intersection spacing.	No; located about 300 feet south from existing intersection of 6th Avenue and Picadilly Road-- does not meet acceptable City of Aurora signalized intersection spacing requirements (0.5 mile and 600 feet minimum), connector roadways have been added to connect existing 6th Avenue to this alternative Parkway. There is sufficient distance from Tower Road based on CDOT access criteria for Category R-A (minimum of 0.5 mile). Spacing between Valdai and E-470 west ramp signalized intersections is greater than 600 feet. Both intersections exceed City of Aurora criteria for signalized intersection spacing.	No; there is sufficient distance from Tower Road based on CDOT access criteria for Category R-A (minimum of 0.5 mile). The spacing between the signalized intersections of Picadilly Road and Valdai Street is greater then 0.5 mile. Matches the existing intersections at Valdai Street and the E-470 west ramps. Spacing between Valdai and E-470 west ramp signalized intersections is greater than 600 feet. Both intersections exceed City of Aurora criteria for signalized intersection spacing.	No; there is sufficient distance from Tower Road based on CDOT access criteria for Category R-A (minimum of 0.5 mile). The spacing between the signalized intersections of Picadilly Road and Valdai Street is greater then 0.5 mile. Matches the existing intersections at Valdai Street and the E-470 west ramps. Spacing between Valdai and E-470 west ramp signalized intersections is greater than 600 feet. Both intersections exceed City of Aurora criteria for signalized intersection spacing.	

**Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension
Level 2 - No Action and Alternative Alignments - Quantitative Screening Matrix**

Criteria		Alternative Alignments					
		NA	1A	2A	4A	4B	
		No Action					
							
For Comparison Purposes		A hybrid of Alt. 1 with Alt. 2	Refinement of Alt. 2	Refinement of Alt. 4	A hybrid of Alt. 4 with Alt. 2		
Traffic Operations and Engineering Considerations (Continued)	Provide Transportation Infrastructure to Support Planned Development	Is there accessibility to 6th Avenue Parkway Extension for this alternative from undeveloped parcels (Yes or No)? If so, how many parcels have access (#)?	n/a for this alternative	Yes. 7 parcels have access	Yes. 5 parcels have access	Yes. 2 parcels have access	Yes. 4 parcels have access
	Is this alternative consistent with future land use plans and local agency objectives (Yes or No)?	No. This alternative limits future land use plans for the study area.	Yes, this connection from SH 30 to the east has been in the City of Aurora Comprehensive Plan since 1987. This 6-lane roadway is also included in the City's 2007 Update of the Northeast Area Transportation Study and this Study is referenced in the 2009 Comprehensive Plan. This alternative provides this connection using the existing 6th Avenue right-of-way.	Yes, this connection from SH 30 to the east has been in the City of Aurora Comprehensive Plan since 1987. This 6-lane roadway is also included in the City's 2007 Update of the Northeast Area Transportation Study and this Study is referenced in the 2009 Comprehensive Plan. This alternative provides this connection on mostly new right-of-way.	Yes, this connection from SH 30 to the east has been in the City of Aurora Comprehensive Plan since 1987. This 6-lane roadway is also included in the City's 2007 Update of the Northeast Area Transportation Study and this Study is referenced in the 2009 Comprehensive Plan. This alternative provides this connection on mostly new right-of-way and was the alignment recommended in previous planning studies.	Yes, this connection from SH 30 to the east has been in the City of Aurora Comprehensive Plan since 1987. This 6-lane roadway is also included in the City's 2007 Update of the Northeast Area Transportation Study and this Study is referenced in the 2009 Comprehensive Plan. This alternative provides this connection on mostly new right-of-way.	
Traffic Operations and Engineering Considerations (Continued)	Consider Feasibility and Constructability of Improvements	How many residential property accesses are required to be maintained for this alternative during construction (#)?	n/a for this alternative.	9 residential property accesses need to be maintained.	3 residential property accesses need to be maintained.	3 residential property accesses need to be maintained.	3 residential property accesses need to be maintained.
		Does this alternative meet project design criteria (Yes/No)?	n/a for this alternative	Yes	Yes	Yes	Yes
		Does this alternative impact a major water, sewer or other utility line facility (Yes or No)?	No impacts to utilities.	YES. There is approximately 10' of cut over the 30" waterline, gas line (potentially petroleum), fiber optic line, and telecom lines from Sta. 213+00 to 218+00. The 30" waterline would be very expensive to relocate and may not be feasible to relocate. The utility depths are currently unknown.	NO. There are no known utility impacts for this alternative.	YES, minor. There are fills and minor cuts over existing major utilities. Minor adjustments, resets, and modifications are required. No major utility conflicts for this alternative.	YES. There is approximately 4' of cut over the 16" waterline from Sta. 197+00 to 201+00. The waterline depth is currently unknown.
		Is the bridge structure on a straight alignment for this alternative [less complicated and quicker to construct] (Yes or No)?	n/a for this alternative.	Yes	Yes	Yes	Yes
		What is the overall bridge length for this alternative (feet)?	n/a for this alternative.	700'	700'	620' - a deviation between bridge lengths is not considered immense when less than 10%	700'
Property Impacts	Avoid or Minimize Residential and Non-Residential Property Impacts	How much residential property needs to be permanently acquired for this alternative (acres)?	no residential properties are impacted	2.0 ac. A property was considered residential if there was a house located on the property and not based on zoning.	1.6 ac. A property was considered residential if there was a house located on the property and not based on zoning.	2.1 ac. A property was considered residential if there was a house located on the property and not based on zoning.	2.1 ac. A property was considered residential if there was a house located on the property and not based on zoning.
		How much non-residential property needs to be permanently acquired for this alternative (acres)?	no non-residential properties are impacted	32.2 ac	34.9 ac	24.7 ac	33.4 ac
		How many partial versus full permanent acquisitions of residential properties are needed for this alternative (#)? [A residential property was considered if there was a house located on the property and not based on zoning.]	No partial or full acquisitions are required.	• 1 full permanent acquisition (Parcel 114) based on not being able to maintain a setback of 20 feet from the proposed right-of-way line • 5 partial acquisitions of residential property	• 0 full permanent acquisitions based on not being able to maintain a setback of 20 feet from the proposed right-of-way line • 2 partial acquisitions of residential property	• 0 full permanent acquisitions based on not being able to maintain a setback of 20 feet from the proposed right-of-way line • 2 partial acquisitions of residential property	• 0 full permanent acquisitions based on not being able to maintain a setback of 20 feet from the proposed right-of-way line • 2 partial acquisitions of residential property
		How many partial permanent acquisitions of non-residential properties are needed for this alternative (#)?	No permanent or non-residential properties are required.	22	16	.	14
		How many residential property relocations are needed for this alternative (#)? [A residential property was considered if there was a house located on the property and not based on zoning.]	No relocations would be required.	1 relocation (Parcel 114) is potentially required based on not being able to maintain a setback (distance from the right-of-way) of 20 feet from the proposed right-of-way line. Those residences located less than 20 feet from the right-of-way would require relocation.	No relocations are anticipated based on not being able to maintain a setback (distance from the right-of-way) of 20 feet from the proposed right-of-way line. Those residences located less than 20 feet from the right-of-way would require relocation.	No relocations are anticipated based on not being able to maintain a setback (distance from the right-of-way) of 20 feet from the proposed right-of-way line. Those residences located less than 20 feet from the right-of-way would require relocation.	No relocations are anticipated based on not being able to maintain a setback (distance from the right-of-way) of 20 feet from the proposed right-of-way line. Those residences located less than 20 feet from the right-of-way would require relocation.

**Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension
Level 2 - No Action and Alternative Alignments - Quantitative Screening Matrix**

Criteria		Alternative Alignments					
		NA	1A	2A	4A	4B	
		No Action					
							
For Comparison Purposes		A hybrid of Alt. 1 with Alt. 2	Refinement of Alt. 2	Refinement of Alt. 4	A hybrid of Alt. 4 with Alt. 2		
Environmental Considerations	Avoid or Minimize Impacts to Floodways and Floodplains	floodplains would change due to natural changes due to flooding, low flow channel migration, and erosion	A rise in the water surface profile for approximately 1600 feet (1000' upstream and 600' downstream of bridge). Max rise is 0.80 feet 50 feet upstream of bridge. Bridge aligns well with direction of flow to minimize scour impacts. Water surface elevation rise affects 5 properties all owned by COA. The rise has the potential to affect two additional properties, one of which is owned by COA and the other is part of Buckley Air Force Base. Potential to impact 3 structures on Coal Creek Arena property.	A rise in the water surface profile for approximately 1600 feet (1000' upstream and 600' downstream of bridge). Max rise is 0.80 feet 50 feet upstream of bridge. Bridge aligns well with direction of flow to minimize scour impacts. Water surface elevation rise affects 5 properties all owned by COA. The rise has the potential to affect two additional properties (134 and 138), one of which is owned by COA and the other is part of Buckley Air Force Base. Potential to impact 3 structures on Coal Creek Arena property.	A rise in the water surface profile for approximately 1900 feet (1400' upstream and 500' downstream of the bridge). Max rise is 1.71 feet 125 feet upstream of the bridge. A sharp bend in the low flow channel directly upstream of the proposed bridge will have a high potential to cause scour at the west abutment. Water surface elevation rise affects 7 properties; 5 are owned by COA and 2 are private. The rise has the potential to affect an additional 4 properties. One property is owned by COA and three are private. At this level of analysis, it does not appear that any insurable structures will be impacted by the rise.	A rise in the water surface profile for approximately 1600 feet (1000' upstream and 600' downstream of bridge). Max rise is 0.80 feet 50 feet upstream of bridge. Bridge aligns well with direction of flow to minimize scour impacts. Water surface elevation rise affects 5 properties all owned by COA. The rise has the potential to affect two additional properties, one of which is owned by COA and the other is part of Buckley Air Force Base. Potential to impact 3 structures on Coal Creek Arena property.	
	Avoid or Minimize Environmental Impacts	How much floodway/floodplain areas are impacted (maximum rise in water surface elevation)?	No Section 4(f) properties would be impacted.	• 0.3 Total Acres impacted • 407 linear feet of existing trail impacted	• 0.3 Total Acres impacted • 407 linear feet of existing trail impacted	• 0.2 Total Acres impacted • No trail impacts.	• 0.3 Total Acres impacted • 407 linear feet of existing trail impacted
	How much of the Section 4(f) properties are impacted by this alternative (acres)/How much of the existing trail is impacted by this alternative (linear feet)?	No impacted properties.	2.2 Total Acres impacted	2.2 Total Acres impacted	2.4 Total Acres impacted	7.7 Total Acres impacted	
	How many acres are impacted by this alternative that were purchased with Natural Resource Damages Funds/ Conservation Easements/GOCO (acres)?	No requirement to voter approval	None. Continued city use does not involve a sale or conveyance or other type of transfer of an ownership interest and therefore the charter provision requiring voter approval would not apply anyway.	None. Continued city use does not involve a sale or conveyance or other type of transfer of an ownership interest and therefore the charter provision requiring voter approval would not apply anyway.	None. Continued city use does not involve a sale or conveyance or other type of transfer of an ownership interest and therefore the charter provision requiring voter approval would not apply anyway.	None. Continued city use does not involve a sale or conveyance or other type of transfer of an ownership interest and therefore the charter provision requiring voter approval would not apply anyway.	
	How many parcels are impacted by this alternative that require voter approval to sell/convey (#)?	No impacts to wetlands	Nationwide (0.55 Acres Surveyed Wetlands under full bridge. Anticipated to be less once design and placement of piers occurs.)	Nationwide (0.55 Acres Surveyed Wetlands under full bridge. Anticipated to be less once design and placement of piers occurs.)	Nationwide (0.16 Acres Surveyed Wetlands under full bridge. Anticipated to be less once design and placement of piers occurs.)	Nationwide (0.55 Acres Surveyed Wetlands under full bridge. Anticipated to be less once design and placement of piers occurs.)	
	Ability to maintain a Nationwide Section 404 permit based on potential impacts?	No impact	Low Potential - Impacts 0.09 Acres of Threatened ULTO Habitat	Low Potential - Impacts 0.09 Acres of Threatened ULTO Habitat	Low Potential - Impacts 0.11 Acres of Potential Suitable Habitat	Low Potential - Impacts 0.09 Acres of Potential Suitable Habitat	
	What is the potential to impact suitable Ute Ladies'-Tresses Orchid (ULTO) habitat by this alternative (low, medium, high)?	No impact to riparian areas	YES, greater than 1 acre of riparian beneath full bridge structure	YES, greater than 1 acre of riparian beneath full bridge structure	YES, greater than 1 acre of riparian beneath full bridge structure	YES, greater than 1 acre of riparian beneath full bridge structure	
	Is the amount (acres) of riparian habitat removed/impacted by this alternative estimated to be greater than 1 acre?	No changes to wildlife movement corridors	• High Ability • 126 ft wide x 700 ft long x 12 ft tall	• High Ability • 126 ft wide x 700 ft long x 12 ft tall	• Low Ability • 126.0 ft wide x 620 ft long x 12 ft tall Shorter structure is less desirable because the abutments are closer together therefore creating restrictive sight lines for wildlife	• High Ability • 126 ft wide x 700 ft long x 12 ft tall	
What is the ability of this alternative to accommodate wildlife movement corridors due to structure types (low, medium, high)?	No impacts to bald eagle use areas	Impacts 0 Acres of Bald Eagle High Activity Areas.	Impacts 0 Acres of Bald Eagle High Activity Areas.	• Impacts 4.83 Acres of Bald Eagle High Activity Areas.	• Impacts 0.66 Acres of Bald Eagle High Activity Areas.		
How much of the high bald eagle use areas [including potential nesting locations] are impacted by this alternative (acres)?							

**Environmental Documentation and Preliminary Design of 6th Avenue Parkway Extension
Level 2 - No Action and Alternative Alignments - Quantitative Screening Matrix**

Criteria		Alternative Alignments				
		NA	1A	2A	4A	4B
		No Action				
						
For Comparison Purposes		A hybrid of Alt. 1 with Alt. 2	Refinement of Alt. 2	Refinement of Alt. 4	A hybrid of Alt. 4 with Alt. 2	
Environmental Considerations	Avoid or Minimize Environmental Impacts					
	What is the potential to impact high use migratory birds [including raptors and waterfowl] habitat based on roadway proximity by this alternative (low, medium, high)?	No impacts to migratory birds	<ul style="list-style-type: none"> • Low Potential Impact to Confluence Open Space • Intersects 6 Red-tail Hawk 1/3 mile nest buffers Roadway alignment maintains a long distance from Waterfowl Ponds thereby decreasing impacts to waterfowl (measuring to parallel roadway elements): <ul style="list-style-type: none"> • 1,460 ft from Pond A • 1215 ft from Pond B • 1580 ft from Pond C • 1920 ft from Pond D 	<ul style="list-style-type: none"> • Low Potential Impact to Confluence Open Space • Intersects 6 Red-tail Hawk 1/3 mile nest buffers Roadway alignment maintains a long distance from Waterfowl Ponds thereby decreasing impacts to waterfowl Long Distance from Waterfowl Ponds (measuring to parallel roadway elements): <ul style="list-style-type: none"> • 1,240 ft from Pond A • 875 ft from Pond B • 1230 ft from Pond C • 1590 ft from Pond D 	<ul style="list-style-type: none"> • High Potential Impact to Confluence Open Space • Intersects 7 Red-tail Hawk 1/3 mile nest buffers Roadway alignment is immediately adjacent to the Confluence Open Space creating a short distance from Waterfowl Ponds (measuring to parallel roadway elements): <ul style="list-style-type: none"> • 540 ft from Pond A • 85 ft from Pond B • 460 ft from Pond C • 755 ft from Pond D 	<ul style="list-style-type: none"> • High Potential Impact to Confluence Open Space • Intersects 8 Red-tail Hawk 1/3 mile nest buffers Roadway alignment is immediately adjacent to the Confluence Open Space creating a short distance from Waterfowl Ponds (measuring to parallel roadway elements): <ul style="list-style-type: none"> • 365 ft from Pond A • 80 ft from Pond B • 450 ft from Pond C • 755 ft from Pond D
	Degree of Constraints on Wildlife Movement due to Barrier Effect/Edge Encroachment (low, medium, high)	No constraints on wildlife movement	<ul style="list-style-type: none"> • Low Degree of Constraints to existing wildlife movement corridor • 1,120 ft, this is the overall length that wildlife movement may parallel this alternative.	<ul style="list-style-type: none"> • Low Degree of Constraints to existing wildlife movement corridor • 1,120 ft, this is the overall length that wildlife movement may parallel this alternative.	<ul style="list-style-type: none"> • High Degree of Constraints to existing wildlife movement corridor • 5,130 ft along the Triple Creek Greenway Corridor Riparian Boundary, this is the length that wildlife movement may parallel this alternative.	<ul style="list-style-type: none"> • High Degree of Constraints to existing wildlife movement corridor • 8,115 ft along the Triple Creek Greenway Corridor Riparian Boundary, this is the length that wildlife movement may parallel this alternative.
Are there noise receptors within 500' of this alternative (Yes/No)? If so, how many (#)?	No noise impacts	Yes, there are 12 sensitive noise receivers within 500'	Yes, there are 12 sensitive noise receivers within 500'	Yes, there are 5 sensitive noise receivers within 500'	Yes, there are 7 sensitive noise receivers within 500'	
For Information Only						
Concept level Probable Construction Costs. Information to determine extraordinary costs - ALTERNATIVES ARE WITHIN 25%						