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I-70 EAST PREFERRED ALTERNATIVE AESTHETIC + DESIGN GUIDELINES

PREPARED FOR COLORADO DEPARTMENT OF TRANSPORTATION
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PREPARED BY DESIGNWORKSHOP

DRAFT

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INTRODUCTION
EXECUTIVE SUMMARY

I-70 East plays many important roles in the daily lives of Front Range residents and visitors to both Metro Denver and the Rocky Mountains. Since its construction, the highway has changed the form of area communities, connected businesses and the local workforce, and welcomed guests to the region. The aesthetic character of I-70, both in its structures and roadsides, is an important reflection of the Denver Metro Region and the State of Colorado. It is important that future projects along the highway are fully integrated into surrounding communities, provide safe passage for local pedestrians and bicyclists as well as highway travellers, and will create a timeless aesthetic lasting into the future. These guidelines provide a corridor-wide vision that will enhance the aesthetic character of the I-70 East Corridor.

PROJECT BACKGROUND

The I-70 East Aesthetic and Design Guidelines provide a vision for the design of future projects and improvements on I-70 from its intersection with I-25 in Denver to Tower Road in Aurora, Colorado. The Guidelines supplement the I-70 East Final Environmental Impact Statement (FEIS) to provide guidance in the development of future highway elements and features that impact the visual experience and visual resources of the highway.

The I-70 East Environmental Impact Statement (EIS) is a joint effort between the Federal Highway Administration (FHWA) and the Colorado Department of Transportation (CDOT). Currently, I-70 East is one of the most heavily traveled and congested highway corridors, both in the region and in the state. The corridor provides a number of important transportation functions, including interstate and intrastate travel along I-70; regional access from downtown Denver and the metropolitan area to Denver International Airport (DIA); linkage as an inner beltway between I-225 and I-270; and access to adjacent employment areas, neighborhoods, and new development centers. The purpose of the I-70 East EIS project is to implement a transportation solution that improves safety, access, and mobility and addresses congestion on I-70 in the project area. The purpose of these guidelines is to provide design guidance for the visual character and quality of the transportation solution described in the EIS.

PROJECT GOALS

The goals of the I-70 East Aesthetic and Design Guidelines are :

- Create an aesthetic vision for the entire corridor that will serve as the framework to guide the design of future improvements, integrating visual and functional goals.
- Create a transportation corridor that blends into the context of the surrounding neighborhoods.
- Create the appropriate interface with the neighborhoods that are adjacent to and affected by the corridor.
- Establish visual themes that will apply to the project design.
- Establish unifying elements that encourage continuity throughout the corridor.
- Facilitate the participation of stakeholders in the determination of long-term goals for character, design and sustainability.
- Assist in the review of the FEIS and provide a level of predictability for design elements and construction of the entire project.

PROCESS

The I-70 East Aesthetic and Design Guidelines, developed during the EIS process with Denver and the community, will be used during final design to help CDOT identify appropriate aesthetic design elements to ensure compatibility within the community and each viewshed. CDOT is committed to following the guidelines and continued community involvement during final design and construction.

The Aesthetic and Design Guidelines serve as a minimum level of project aesthetics, are referenced in the FEIS (Section 5.8) for the Corridor, and require the Developer to build upon the conceptual character of the proposed project, including an understanding of the existing visual character, and determine if the community has any defined visual preferences. The latter can be documented by listing and discussing plans, policies, and regulations as evidence of the public's visual preferences; observing the existing landscape and conducting interviews with local officials and civic leaders; and engaging neighborhoods and travelers using a public involvement approach. The refinement of the guidelines are to be included in project design through construction, and document in an updated Aesthetic and Design Guidelines document for future planning needs.

Concurrently, a design process is underway for an enhancement to the lowered portion of the highway between Clayton and Columbine Streets. A design team has been working to establish concepts for a landscaped cover that will cap the highway. For more information or design guidance on the cover, please refer to FEIS Attachment P, *Cover Planning*.

Community Workshop in August 2015

Guidelines provide direction for highway elements and structures

Westbound travel on the I-70 East Corridor

Guidelines for frontage roads are also included in this document

For an evaluation of Existing Visual Resources and Aesthetic Qualities, refer to the FEIS 5.8 Visual Resources and Aesthetic Qualities. To learn about local historic properties and their significance to the community, please see FEIS 5.6 Historic Preservation.

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HOW TO USE THIS DOCUMENT

SAMPLE PAGE

1-4. SUPPORT STRUCTURES

In Segment 1 there are two local street underpasses at Lincoln and Washington Streets. Should reconstruction of this segment take place in the future, developers should collaborate with CDOT to meet the following recommendations.

SUPPORT STRUCTURE RECOMMENDATIONS

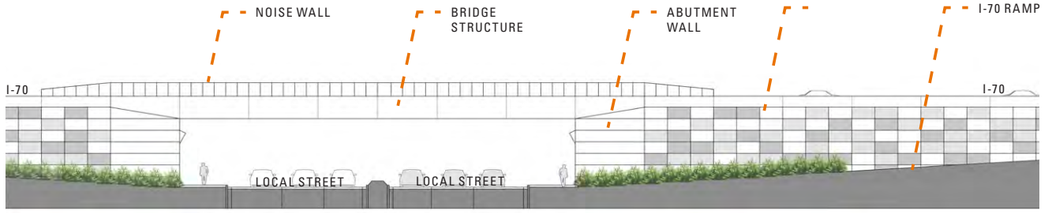
1.5 BRIDGES AND ABUTMENTS

- Bridges should incorporate low profile structural design features that appear to span across and beyond abutment walls below through the extension of noise walls.
- Bridge structural elevations should incorporate horizontal fenestration that provides simple shadow effect.
- Bridge abutment walls should be predominantly vertical.
- Bridge abutment wall design applications should extend horizontally beyond the face of the underpass opening; this extension should be equal to or greater than the height of the abutment wall.
- The treatment of abutment walls (both below the bridge structure and beyond the face of the underpass opening) should be distinctively different than that of adjacent retaining walls; this may include vertical or horizontal fenestration, changes in color or texture, interpretive artwork, or other elements that enhance the experience of approaching and driving under bridge structures.

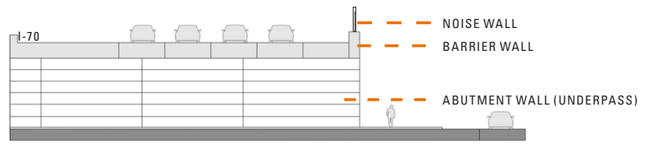
1.6 RETAINING WALLS

- Retaining walls in Segment 1 should incorporate an artistic interpretation of the north-south theme of the segment, expressing the adjacent land uses, history or culture of the area.
- Retaining wall design should incorporate a variation in fenestration, color, texture, materials, etc. so as to not appear monolithic.
- In general, retaining walls should be predominantly vertical. Where space is available between the face of retaining wall and the back of adjacent curb, terracing of retaining walls may be appropriate to provide relief in the scale

IMPLEMENTATION EXAMPLE



This example uses modular concrete panels with depressions and extractions that will allow for a play of light and shadow.



PRECEDENT IMAGERY

OTHER RESOURCES

In addition to these Aesthetic and Design Guidelines, there are a number of other manuals that should be consulted for any future planning and design of improvements to I-70 East:

AASHTO - A Policy on Geometric Design of Highways and Streets (2011)
https://bookstore.transportation.org/collection_detail.aspx?ID=110

CDOT Roadway Design Guidelines (2005)
https://www.codot.gov/business/designsupport/bulletins_manuals/roadway-design-guide

CDOT Sign Design Manual (2013)
https://www.codot.gov/library/traffic/traffic-manuals-guidelines/fed-state-co-traffic-manuals/Sign%20Design%20Manual.pdf

CDOT Landscape Architecture Manual (2014)
https://www.codot.gov/programs/environmental/landscape-architecture/cdot-landscape-architecture-manual-8-18-14/view

City and County of Denver Streetscape Design Manual (1993)
http://www.denvergov.org/Portals/646/documents/Zoning/other_regulations/DesignGuidelines_StreetscapeDesign_1993.pdf

FHWA Guidelines for the Visual Impact Assessment of Highway Projects (2015)
https://www.environment.fhwa.dot.gov/guidebook/documents/VIA_Guidelines_for_Highway_Projects.asp

The I-70 East Aesthetic and Design Guidelines establish baseline conditions for reconstruction of I-70 East as well as any future improvements to the I-70 corridor between I-25 and Tower Road. The Developer shall continue design coordination with the CDOT Project Engineer, CDOT appointed landscape architect, CDOT Visual Resource Expert, and local jurisdiction for all aesthetic treatments that are incorporated into the plans and specifications during the project design process. Improvements and new highway elements introduced (including the edges, medians, frontage roads, and landscape treatments) shall build upon a cohesive, uncluttered appearance for the corridor, as well as the corridor vision.

The preferred alternative included in the FEIS indicates that a section of the lowered portion of the highway, between Clayton Street and Columbine Street, will include a landscaped cover. The design of this cover has undergone a separate design and community engagement process; final design outcomes of this portion of the highway may or may not follow the guidelines outlined in this document.

The contents of these guidelines are formatted so that a reader may engage with the material in a non-linear fashion. While each section provides varying degrees of detail and information, these sections present individual topics which do not require a complete reading of the material that precedes it.

These guidelines are broken down into four unique chapters; each chapter provides recommendations for the aesthetic character and quality of highway elements associated with one segment of the highway. Photographs, illustrations, and diagrams are for informational purposes only and do not represent mandated future conditions, only visual suggestions of what might be.

INTRODUCTION
EXISTING CONDITIONS

This chapter examines the existing visual character, context, and quality of I-70 East to identify both the unique and important attributes of the corridor, as well as elements of highway infrastructure that could be enhanced or improved in future projects. The existing conditions evaluation leads to a segmented approach to the following aesthetic guidelines. Each distinct segment is defined based on the visual characteristics of highway travel, surrounding neighborhood and landscape context, and expected transportation improvements.

VISUAL CHARACTER

The visual character of the existing highway is classified into two distinct experiences: East-West and North-South. Travellers of the highway experience east-west visual characteristics as they drive along I-70. The north-south visual characteristics are seen by those who cross over or under the highway; live near I-70 and view the highway from their property or neighborhood; and those who work at, own, or patronize a business with views of the highway.

EAST-WEST EXPERIENCE

The existing I-70 East between the intersections of I-25 and Tower Road transitions from a very urban, high-volume, six-lane highway on the western end to a more open, four-lane highway on the east end. The experience of travelling along I-70 East is greatly affected by the direction of travel. Those travelling west from Tower Road have a backdrop of the Rocky Mountains on the Western horizon. Approaching I-25, intermittent views to Downtown Denver emerge, giving drivers and passengers an interesting vista. Without the vistas of downtown and the Rockies, views travelling east are more sensitive to surrounding land-uses, such as the industrial facilities that line a stretch of the highway. As vehicles travel further east towards Tower Road, the prairie landscape and Colorado's big sky serve as the horizon for travelers.

Westbound views on the I-70 East Corridor

While the scenic experience of these two paths is comparatively strong relative to other major interstate highways in the country, the design elements that make up a traveler's immediate surroundings are somewhat disjointed. The presence or absence of walls and/or fencing lacks smooth and even transitions. Overpasses and their related bridges and landscape lack unifying elements along the corridor. While some interchanges, such as at Central Park Boulevard and Quebec Street, are well-integrated into the landscape and reflect surrounding land uses, many lack these qualities. Boundaries between frontage roads and the highway have inconsistent presence and quality. As I-70 East undergoes changes in the future, the creation of a unified aesthetic will be an important element for bettering the corridor and its reflection of the Denver metro area.

Eastbound views on the I-70 East Corridor

NORTH-SOUTH EXPERIENCE

The impact of I-70 for neighboring residents and businesses is largely dependent on whether or the not the existing highway is elevated or at grade. From I-25 to Colorado Boulevard, the highway is elevated and acts as a dominant feature in the neighborhoods through which it passes. Eastward from Colorado Boulevard to Tower Road, the highway is generally at, slightly above, or slightly below grade, as such, its visual impact is mainly limited to immediate adjacencies and overpasses.

Residents of the Elyria, Swansea, and Globeville neighborhoods have the greatest exposure to the existing highway as the road, viaduct, guardrails, fencing, and sound-walls dominate the skyline along 46th Avenue. Certain locations along this portion of the highway, such as the intersection of 46th Avenue and Lincoln Street, have been enhanced with community art to break up the monotony of large sound-walls.

The industrial land uses further east along I-70 are exposed to the highway at close proximity with landscape and fencing that act as buffer. Most fencing in this area is chain-link and landscape is non-irrigated grasses.

Near Tower Road, adjacent land uses have a wider setback from the highway and visual exposure to surrounding communities is less impactful. Swaths of landscape separate surrounding office space and commercial uses from the highway.

Community art piece breaks up the monotony of noise walls at 46th Avenue and Lincoln Street.

Industrial uses along I-70 separated by landscape fencing.

Wide landscape setbacks between development and the highway.

SITE CONTEXT

Travelling east from I-25, I-70 passes through the following neighborhoods:

GLOBEVILLE

Historically an industrial neighborhood, Globeville has evolved to include a strong residential community adjacent to commercial and industrial land uses. Within this neighborhood and adjacent to I-70, the National Western Complex is currently undergoing planning efforts to create a year-round destination for education, arts, entertainment, competition, and commerce.

ELYRIA/SWANSEA

The Elyria and Swansea neighborhoods have also played a major role in Denver's industrial history. Many of these industrial and commercial uses remain among the neighborhood (including the rail lines that serve them) along with the residential communities that have developed and strengthened over time. One of the community's local assets is Swansea Elementary School. The school is currently located immediately adjacent to the I-70 viaduct and will remain at its current location as I-70 expands in the future.

NORTHEAST PARK HILL

This area contains major commercial and industrial uses along I-70. New residential development is currently underway south of the highway as the I-70 corridor continues to prepare for an expanded commuter rail system travelling from Downtown Denver to Denver International Airport.

NORTHFIELD / STAPLETON

The residential and commercial development of the former Stapleton International Airport has created a growing community in Northeast Denver. The main interchange connecting I-70 to this area is Central Park Boulevard, where immediate surroundings include hotel and large-format retail adjacent to the highway.

MONTBELLO

This northeastern community of Denver lies north of I-70 and includes a developing residential community. Land uses adjacent to I-70 include hotel, commercial and some educational facilities. The highway is not visible from the residential neighborhoods.

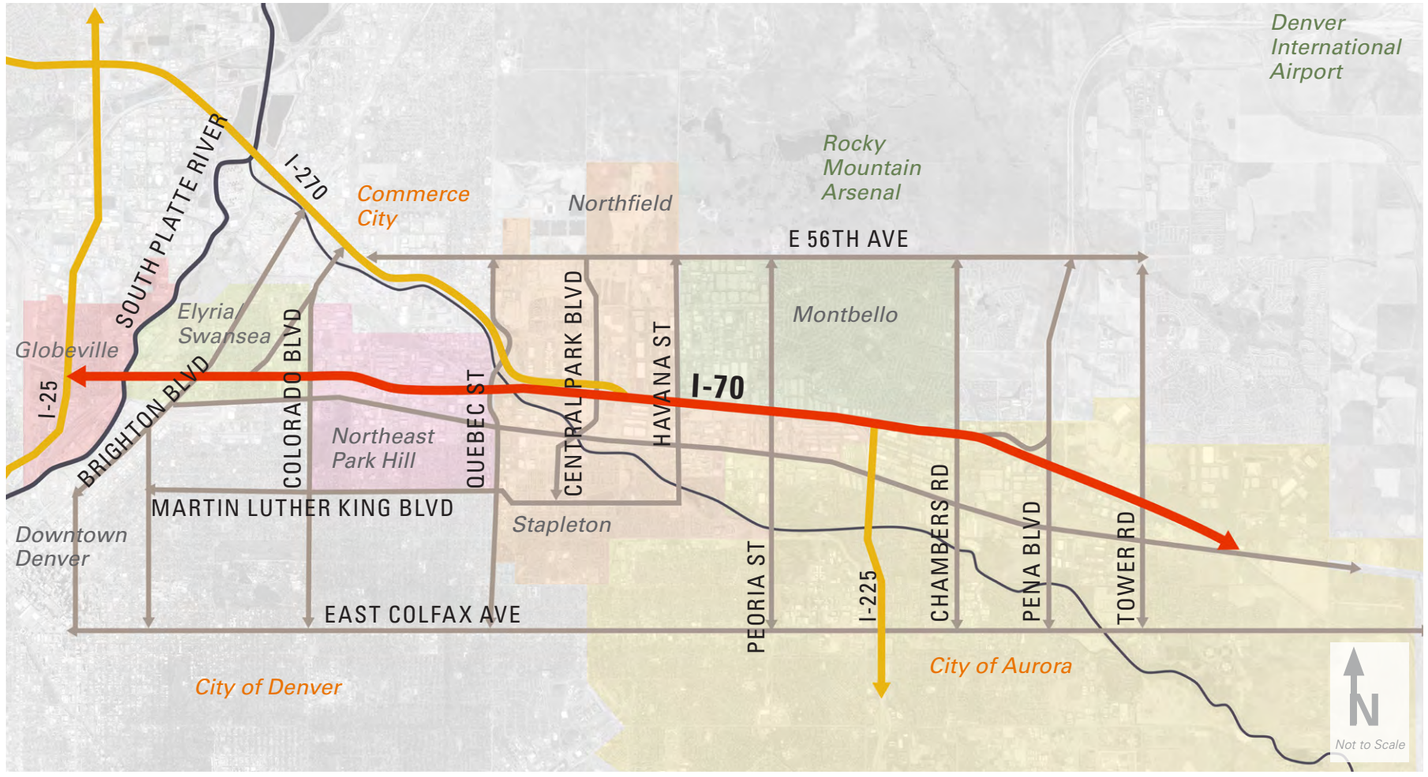
CITY OF AURORA

The eastern-most portion of the I-70 corridor is in the City of Aurora. The areas surrounding the highway are composed mainly of commercial and office uses set back relatively far from the highway.

In addition to these unique communities, the I-70 East corridor also intersects with a number of other important contextual features including the South Platte River and Colorado Front Range Trail, a number of both heavy and light rail tracks, rail yards, two other major roadways including I-270 and I-225, and new development surrounding Denver International Airport.

As the main thoroughfare through these distinctive sites and serving as the main entry to Denver Metro and the Rocky Mountain West, it is important that the aesthetics of I-70 East maintain a representative identity while harmonizing the unique attributes of surrounding communities and landscapes. To accommodate this objective, the corridor has been divided into four representative segments.

Figure 1: SITE CONTEXT MAP



I-70 East passes through a number of unique communities.

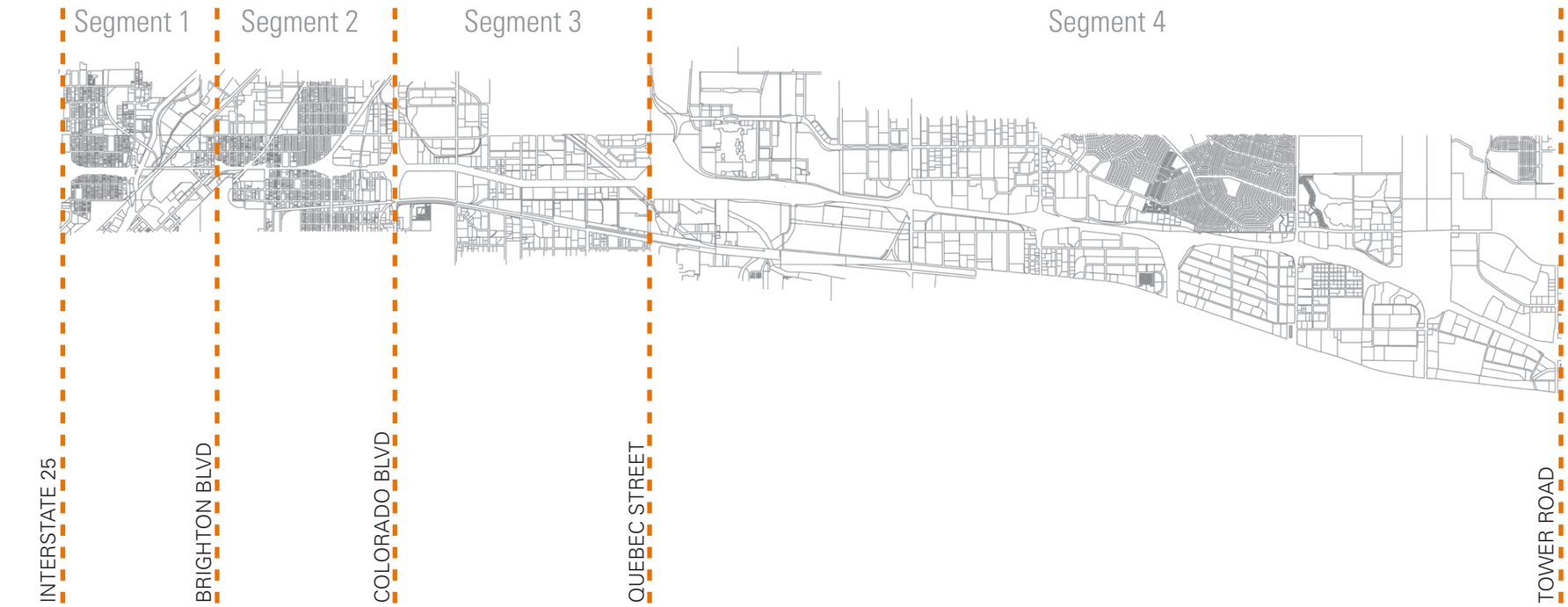
Photo Credit: Ashley Bushey, CDOT

Residential character in the Swansea neighborhood

Rail yards adjacent to I-70 near Monaco Street

I-225 as seen from I-70 East

Figure 2: HIGHWAY SEGMENTS DIAGRAM



HIGHWAY SEGMENTS

The four representative segments include:

Segment 1: 1-25 to Brighton Blvd

Segment 2: Brighton Blvd to Colorado Blvd

Segment 3: Colorado Blvd to Quebec St

Segment 4: Quebec St to Tower Rd

Each segment represents unique qualities of surrounding communities and landscapes that help define the themes and recommendations of these design guidelines in the following chapters.

The existing aesthetics of highway elements, and segment identity are assessed for each segment in the following pages.

Photo Credit: Ashley Bushey, CDOT

Brick building characteristic of Segment 1

Former Eaton Metals factory in Segment 2

Sand Creek Regional Greenway in Segment 3

Areas of new development in Segment 4

SEGMENT 1 I-25 TO BRIGHTON BOULEVARD

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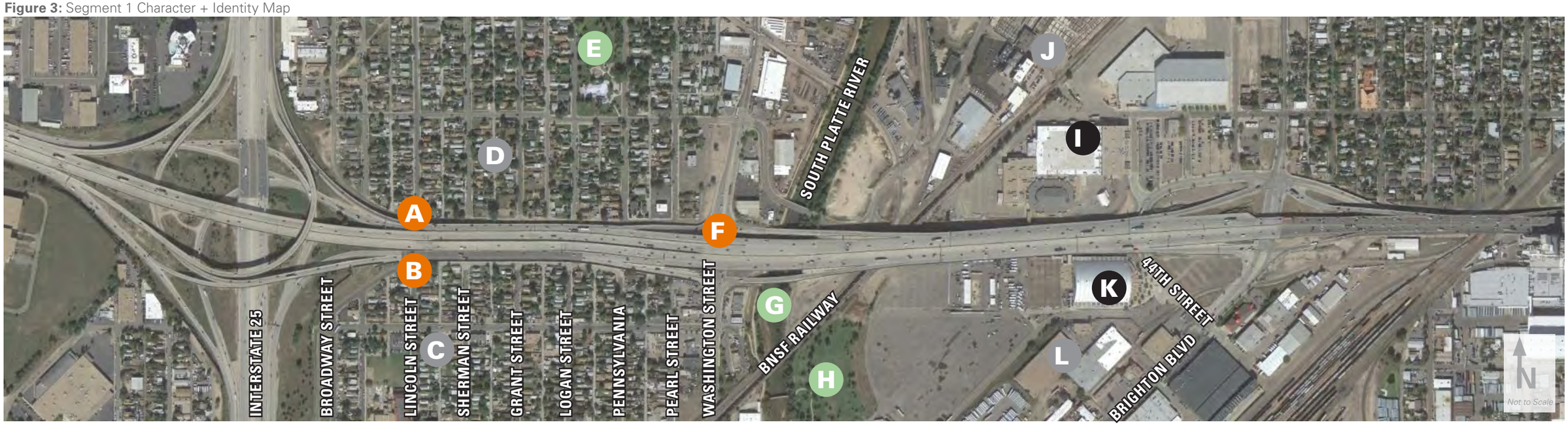
Figure 3: Segment 1 Character + Identity Map



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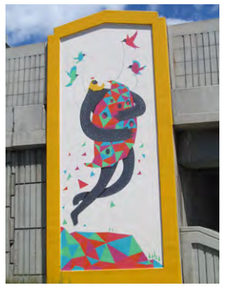
CHARACTER + IDENTITY MAP KEY

A. GLOBEVILLE MURALS - 1

E. ARGO PARK

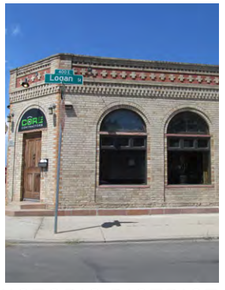
I. NATIONAL WESTERN CENTER




B. GLOBEVILLE MURALS - 2

F. WASHINGTON ST UNDERPASS

J. DENVER STOCKYARDS

C. GARDEN PLACE HISTORIC DISTRICT

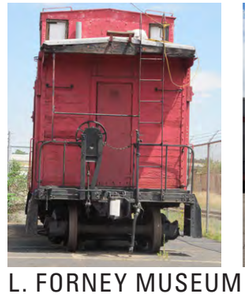
G. SOUTH PLATTE RIVER

K. DENVER COLISEUM


Photo Credit: Ashley Bushey, CDOT

D. GLOBEVILLE HISTORIC DISTRICT

H. GLOBEVILLE LANDING PARK




L. FORNEY MUSEUM OF TRANSPORTATION

NEIGHBORHOOD IMAGERY

BNSF Railroad runs through Segment 1

A residential area south of I-70 with views downtown

Artwork at the National Western Center

Denver Union Stockyard building

NEIGHBORHOOD CHARACTER

Segment one lies within the Globeville neighborhood. Globeville was historically a bustling industrial area which contained the stockyards, meatpacking businesses, and smelting industries. This employment center developed in tandem with residential areas in Globeville representing a diverse cultural fabric. The neighborhood possesses a unique and vibrant color palette, historic buildings, local art installations at Argo Park, the Lincoln and Washington Street underpasses and the National Western Center, and an interesting mix of landscapes. Landscapes that intersect with the I-70 corridor include significant freight rail yards, the South Platte River, Globeville Landing Park and some enhanced streetscapes along Washington Street. T

he fabric of this culturally-rich community is comprised largely of small-scale brick buildings, including houses, commercial buildings, and community anchors such as churches and schools. Iconic buildings such as the Denver Stock Exchange are also constructed in brick. Commonalities of expression include contrasting buff and red brick patterns echoed on residential, commercial, and religious architecture. Artistic expression in this segment reflects the cultural character of the neighborhood, including use of a vibrant color palette, as expressed at the Lincoln underpass Globeville murals, which serve as gateway features in the community.

Today, the area is at the cusp of a renaissance as plans for the National Western Center continue to move forward. The National Western Center is a 130 acre redevelopment plan that intends to support Denver's global standing as a world-class hub for the Western way of life. As plans for I-70 East and the National Western Center will have major impacts on the neighborhood composition and character, the Globeville Neighborhood Plan has identified a number of important neighborhood assets and attributes that the community wishes to include in any future plans. Please refer to this plan:

http://www.denvergov.org/Portals/646/documents/planning/Plans/globeville/GlobevillePlanFinal.pdf

HIGHWAY CHARACTER

Segment 1 of the corridor is an urban high-density area with closely spaced interchanges and ramps, and right-of-way lined by buildings and adjacent streets. Sound walls are present to the entirety of this elevated segment, but lack common language and character. A concrete safety barrier separates eastbound from westbound traffic along this six-lane segment.

This segment provides excellent views for drivers to the National Western Center and Downtown Denver but will continue to act as a visual barrier to the residential community in the area. Integrating this infrastructure into local landscapes and development projects will help create better gateways through the community, connecting north and south residential areas and creating a unified district at the National Western Center.

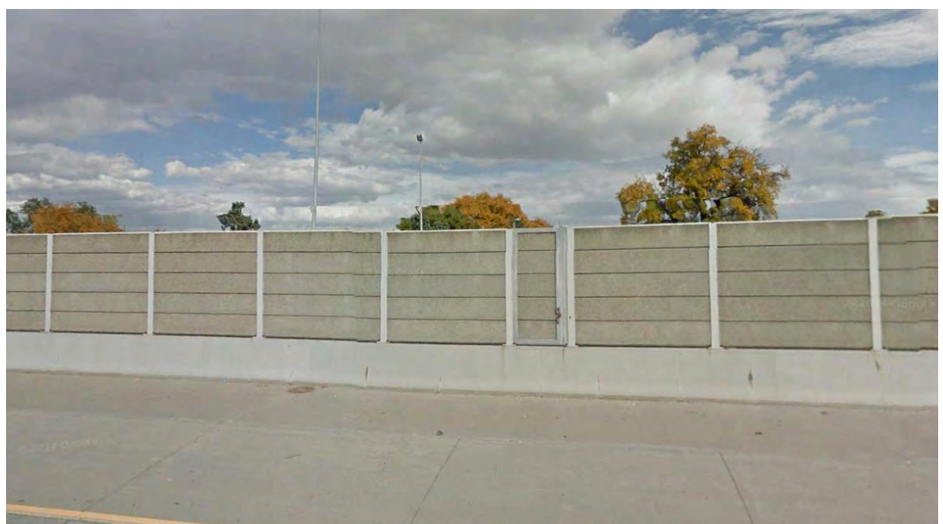
OPPORTUNITIES

- Westbound views to Downtown Denver
- Adjacent land uses encourage creative use of noise walls and interchange landscaping
- Crosses over the South Platte River

RESTRAINTS

- Narrow median
- Tight setbacks

EDGES

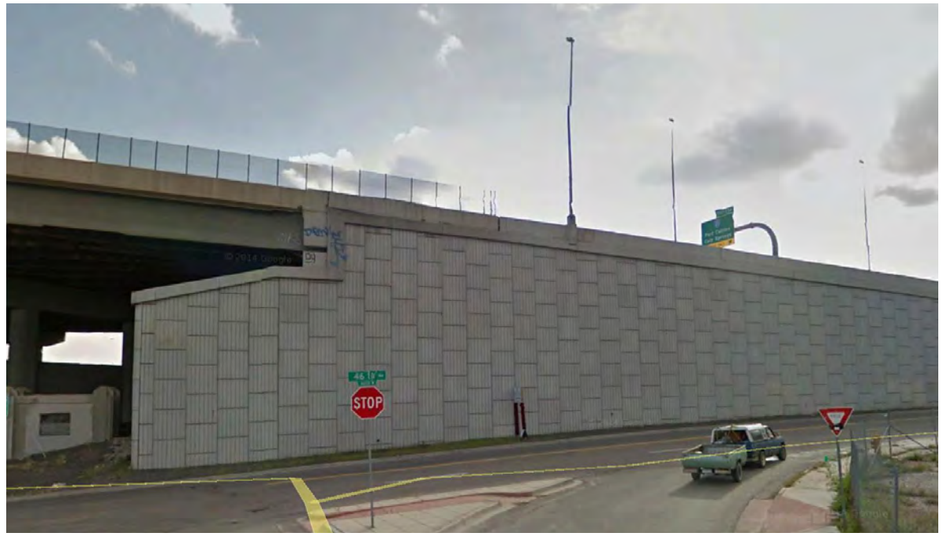


Westbound noise wall in Segment 1

Eastbound wall in Segment 1

SUPPORT STRUCTURES

Highway Bridge over Washington Street



Viaduct abutment

FRONTAGE ROAD

Attached sidewalks along residential section of 46th Avenue

Interface with highway ramping along 46th Avenue

LANDSCAPE TREATMENT

Planting on the neighborhood side of noise walls.

Terraced planting at the Washington Street overpass

SEGMENT 2 BRIGHTON BOULEVARD TO COLORADO BOULEVARD

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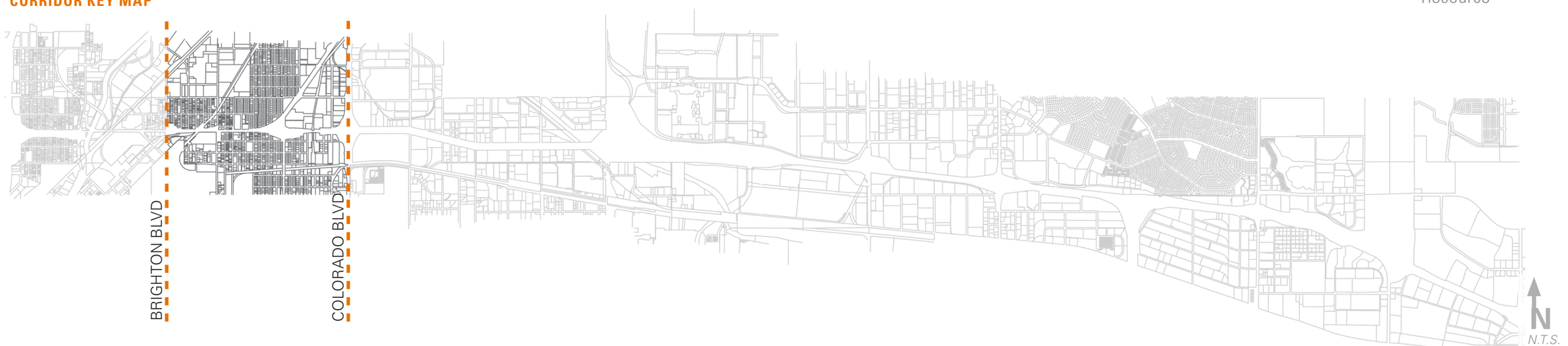
Figure 4: Segment 2 Character + Identity Map

Recreation

Visual Landmark

Community + Cultural Resource

CORRIDOR KEY MAP



CHARACTER + IDENTITY MAP KEY

A. UNION PACIFIC RAILROAD

E. DUNHAM PARK

B. THE GROWHAUS

F. ALFRED WESSEL HISTORIC DISTRICT

C. NESTLE PURINA PET CARE

G. MANNA PRO CORPORATION

D. SWANSEA ELEMENTARY

H. MARKET LEAD

NEIGHBORHOOD IMAGERY

Mural at Swansea Recreation Center reflects neighborhood diversity and youth.

Photo Credit: Ashley Bushey, CDOT

The former Eaton Metals site

Historic character of Elyria School

NEIGHBORHOOD CHARACTER

Segment 2 passes through the Elyria and Swansea neighborhoods. While these are part of the same statistical neighborhood, the areas were founded as two separate settlements, and are continued to be recognized by local residents as distinct neighborhoods. This area has gone through an industrial history similar to Globeville and residential areas developed their own self-sustaining communities over time. For the past 25 years, the area has been a safe and welcoming community for Latino immigrants; and as such, has cultivated a distinct urban-Latino spirit. Brightly painted homes, altars to Nuestra Senora de Guadalupe, water fountains and garden patios decorate the residential neighborhoods. Also prevelant in the area are Anglo and African Americans, some of whom are decedents of the original settlers.

Many structures and sites from the early days of Elyria and Swansea still exist today. Original homes and commercial structures contribute to the unique character of the neighborhoods. This segment includes the Alfred Wessel Historic District, recognized for unique one-story residential architecture. Community gathering spaces such as the Growhaus offer unique opportunities for community conversation, education, and a healthy food source. Prevalent in the neighborhood are the major industrial structures that dominate the landscape including the former Eaton Metals site and Nestle Purina and Manno Pro, which both continue to operate today. The Union Pacific Railroad also significantly impacts local landscapes and corridors.

Similar to Globeville, the Elyria and Swansea neighborhoods will both also play important roles in the development of the National Western Center and the western aesthetics that may come with this new national attraction. The community has provided some input into the potential for aesthetic improvements in their neighborhood. Please reference the Elyria and Swansea Neighborhoods Plan for further information: https://www.denvergov.org/Portals/646/documents/planning/Plans/elyria_swansea/Elyria_Swansea_Neighborhood_Final_Web_sm.pdf

HIGHWAY CHARACTER

Segment 2 is currently elevated with westward views to the Rocky Mountains. Other dominant features of this segment are the Nestle Purina Petcare Company located adjacent to the southern edge of the highway at York Street, and the rail yards just east of Brighton Blvd. This segment includes a variety of edge conditions including noise walls, guardrails, and fencing that currently lack smooth transitions.

OPPORTUNITIES

- Adjacent residential neighborhoods provide rich cultural history for creative inspiration
- Swansea Elementary School
- Future plans include landscaped highway cover

RESTRAINTS

- Very tight setbacks
- Narrow medians

EDGES

Westbound guardrail and wall

Eastbound guardrail and fencing

SUPPORT STRUCTURES

Underpass at the Manna Pro site.

Viaduct over 46th Avenue

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FRONTAGE ROAD

Large intersection and difficult pedestrian conditions at the intersection of 46th, I-70 East and Brighton Blvd

46th Avenue currently runs parallel under infrastructure for I-70 East.

LANDSCAPE TREATMENT

Landscape at Steele St/Vasquez Boulevard intersection

Invasive kochia weeds lining entry ramp at York Street

SEGMENT 3 COLORADO BOULEVARD TO QUEBEC STREET

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Figure 5: Segment 3 Character + Identity Map

A. SAFEWAY DISTRIBUTION CENTER

B. PARK HILL GOLF CLUB

C. FORMER RAIL YARDS

D. COLORADO FRONT RANGE TRAIL

Recreation

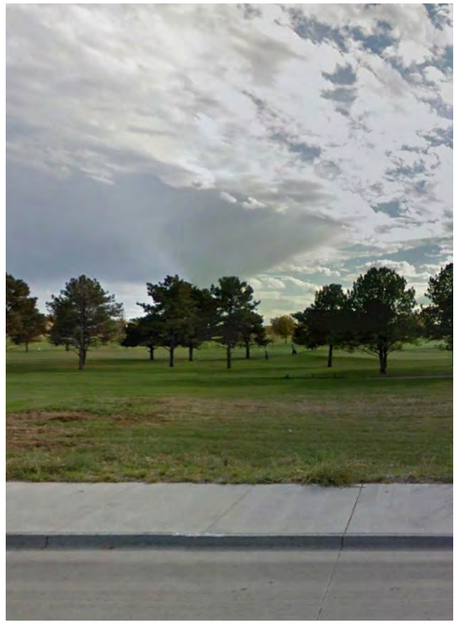
Visual Landmark

Community + Cultural Resource

CORRIDOR KEY MAP

CHARACTER + IDENTITY MAP KEY

A. SAFEWAY HISTORIC DISTRICT



B. PARK HILL GOLF CLUB

Photo Credit: Jennifer Wahlers, Historian, Pinyon Environmental

C. FORMER RAIL YARDS

D. COLORADO FRONT RANGE TRAIL

NEIGHBORHOOD IMAGERY

New development at Park Hill Apartments

Rail running behind the Safeway Distribution Center

Photo Credit: Mike Madrid (2013), Flickr

NEIGHBORHOOD CHARACTER

Segment 3 contains major commercial and industrial uses along I-70. The area includes the Safeway Distribution Center, whose façades offer a taste of historic brickwork in this area of Denver. Other visual cues for Segment 3 include large warehouses, commercial outposts and some office sites.

While the landscape is mostly dominated by infrastructure to accommodate local businesses and trucking, there are some interesting points of significance in this segment. West of Quebec Street, the corridor passes over former rail yards, which command the visual attention of westbound highway travelers and visitors to the area. The surrounding area also includes a section of the Colorado Front Range Trail, a 876-mile multi-purpose trail from Wyoming to New Mexico that links scenic landscapes, cultural and historic points of interest, parks, open space and other attractions.

While there is not much residential in the immediate surroundings, new residential development is currently underway south of the highway as the I-70 corridor continues to prepare for an expanded rail system travelling from Downtown Denver to Denver International Airport.

HIGHWAY CHARACTER

Segment 3 is located within a primarily industrial area. Adjacent uses include businesses large and small that benefit from the quick access to transportation facilities. Edges include non-irrigated landscaping, guardrails and chain-link fencing. Support structures are strictly utilitarian and are deficient in local character or attributes. This segment sees a change in median treatments from the concrete jersey barrier to a double guardrail.

OPPORTUNITIES

- Edge conditions allow interface between highway and local adjacencies
- Support structures are a blank slate for enhancements
- Wider setbacks

RESTRAINTS

- Segment accumulates a lot of trash

EDGES

Highway is separated from frontage road by curb, landscape and fencing

Guardrail on westbound I-70

SUPPORT STRUCTURES

I-70 bridge structure over Monaco Street

I-70 bridge structure over Holly Street

FRONTAGE ROAD

Portions of Segment 3 are slightly elevated, creating a landscaped slope to the frontage road

Some portions of Segment 3 contain sidewalks, but the pedestrian environment is undesirable

LANDSCAPE TREATMENT

Landscape at Quebec Street interchange

Ramp treatments have spotty groundcover, weeds, and a few sparse woody shrubs

SEGMENT 4 QUEBEC STREET TO TOWER ROAD

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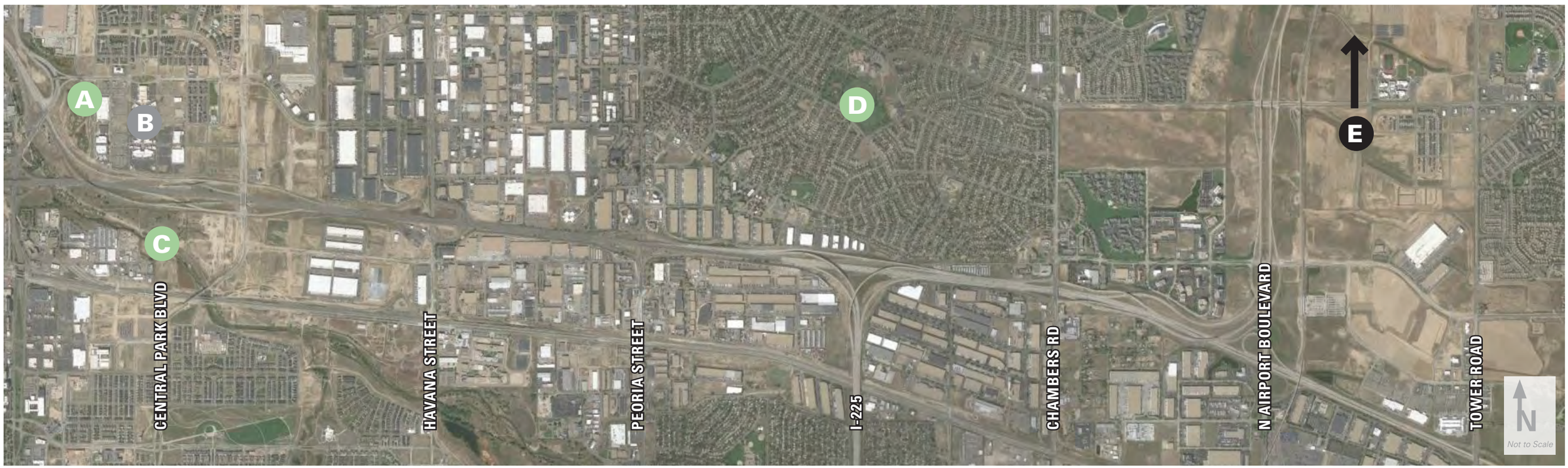
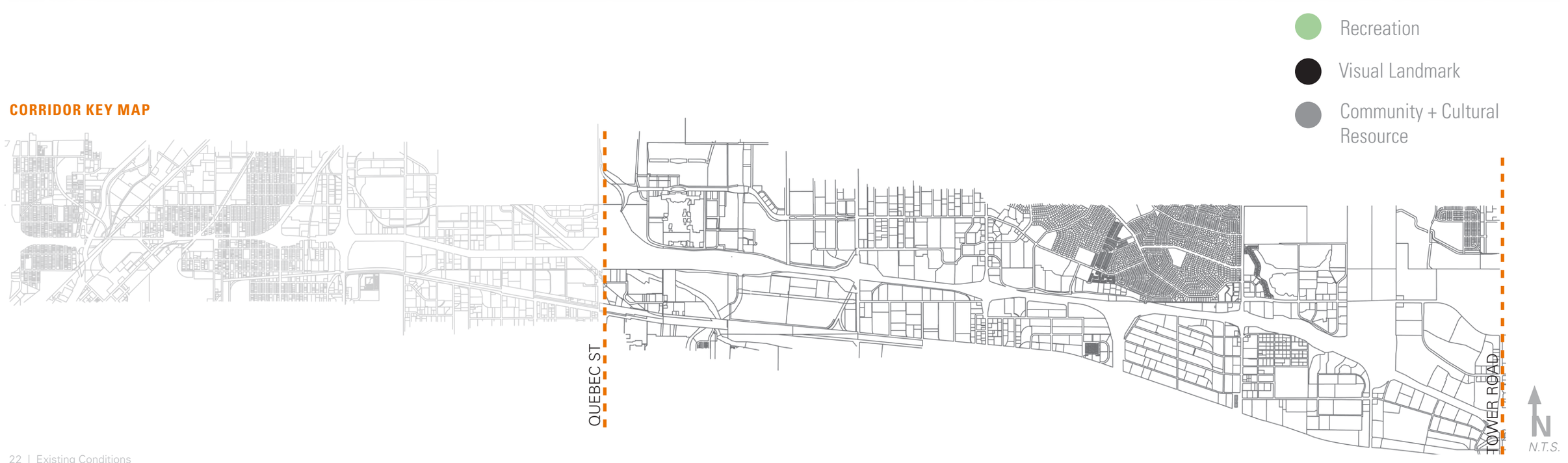
Figure 6: Segment 4 Character + Identity Map



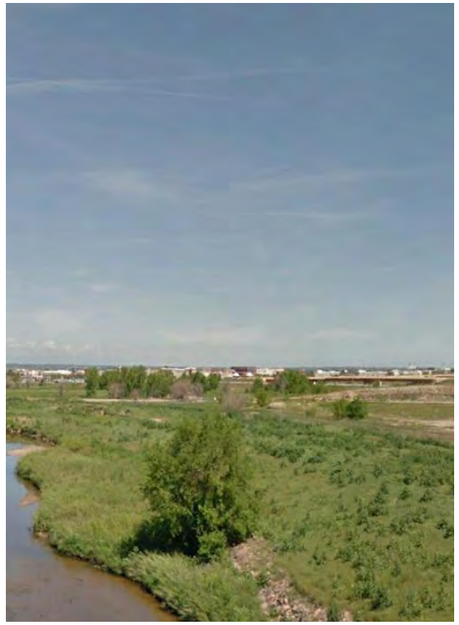
CORRIDOR KEY MAP



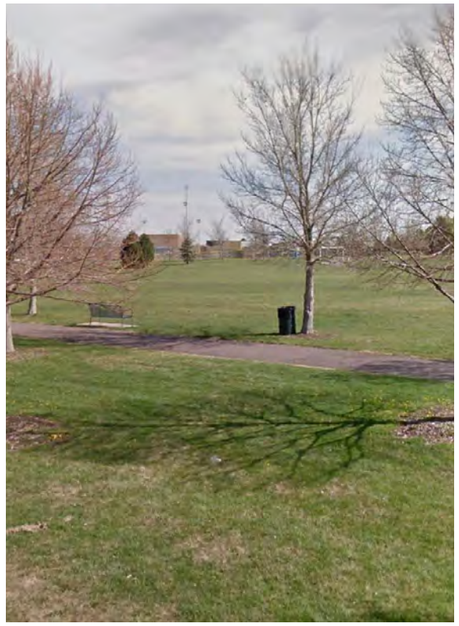
CHARACTER + IDENTITY MAP KEY

A. NORTHFIELD POND PARK

B. THE SHOPS AT NORTHFIELD

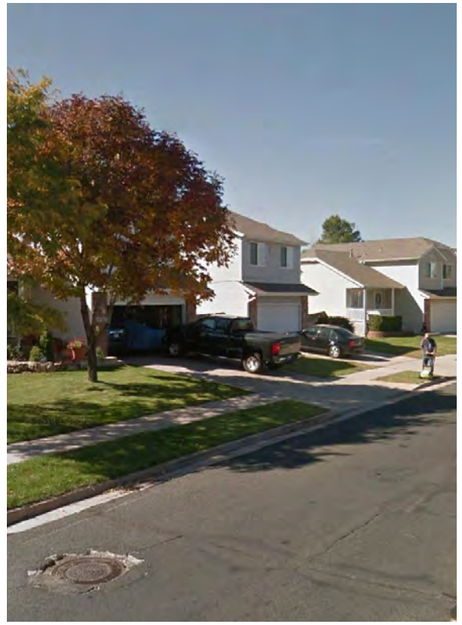


C. COLORADO FRONT RANGE TRAIL

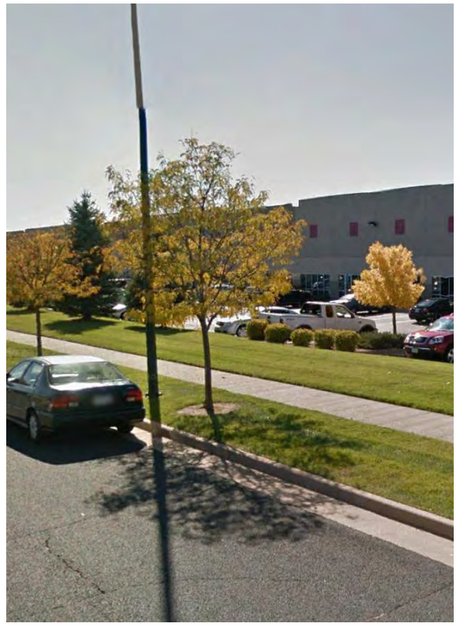


D. MONTBELLO CENTRAL PARK

NEIGHBORHOOD IMAGERY



Suburban neighborhood character in Montbello



Suburban office parks in Segment 4

NEIGHBORHOOD CHARACTER

Immediately surrounding the highway, Segment 4 includes some commercial areas and highly maintained office parks. The area serves regional and national businesses and is travelled by a large weekday workforce.

Moving further north or south from the highway, the new suburban developments of Northfield and Stapleton offer new urbanist communities with local main streets, dining and retail destinations. Additionally, these communities provide a number of park and open space amenities. The area has a distinct suburban feel compared to the rest of the corridor and offers more green space and landscape amenities than the eastern segments.

HIGHWAY CHARACTER

Segment 4 is characterized by more expansive prairie views, fewer overpass treatments, and a transition from a six-lane highway to a four-lane highway with a wider, planted median. With newer development and the disappearance of heavy industrial uses, this portion of the corridor has a somewhat cleaner look than segments to the west.

OPPORTUNITIES

- Overpasses provide more opportunities for visual enhancement
- Relatively wide central median at the eastern portion of the segment allows for inclusion of natural landscapes

RESTRAINTS

- Segment experiences less traffic and exposure than other three segments

EDGES

Westbound noise wall

Chain-link fencing lines the highway

SUPPORT STRUCTURES

Peoria Street overpass

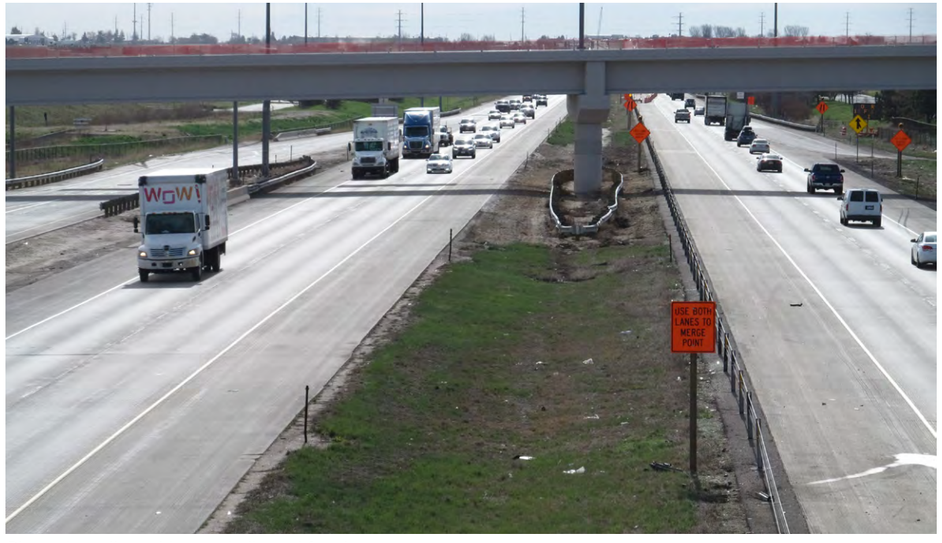
Bridge and abutment walls at Central Park Boulevard

INTERCHANGES

Ramps and landscape at Airport Boulevard

Native grass and prairie landscapes under the rail overpass

MEDIAN



Planted median with guardrails and fencing

Concrete jersey barrier

EXISTING AESTHETICS

SUMMARY

The existing conditions of I-70 East are varied throughout the corridor and lack a cohesive theme that would unify the aesthetic experience of the highway. While similar materials are used throughout (concrete, steel, aluminum), the support structures, edges elements, medians, and landscape treatments are inconsistent in aesthetic character and quality.

The guidelines and recommendations in this document address the future design of the highway through the following components that make up the visual experience of the highway:

- EDGES - Edges include any element that borders the highway and run parallel to traffic. Examples of these elements include fencing, safety barriers, retaining walls, etc.
- SUPPORT STRUCTURES - Support structures include all of the structural pieces that make up under- and over-passes. These may include bridges, abutments, columns, etc.
- MEDIANS - The median is the reserved area that separates opposing lanes of traffic.
- FRONTAGE ROADS - Frontage roads are local roads that run parallel to I-70. These include 46th Street and Stapleton Drive.
- LANDSCAPE TREATMENT - Landscape recommendations concern any planting that will take place along edges of the highway, at intersections and drainage areas, and along frontage roads.

In order to create an aesthetically unified highway, the design of these elements will respond to specific themes identified in the next chapter.

SUPPORT STRUCTURES

Bridge incorporates curvilinear form through fencing

Decorative structure at Central Park Boulevard

Simple abutments in colored concrete

Unfavorable bridge aesthetics

Deteriorating guard at I-70 overpass

Fencing and guardrail at existing overpass

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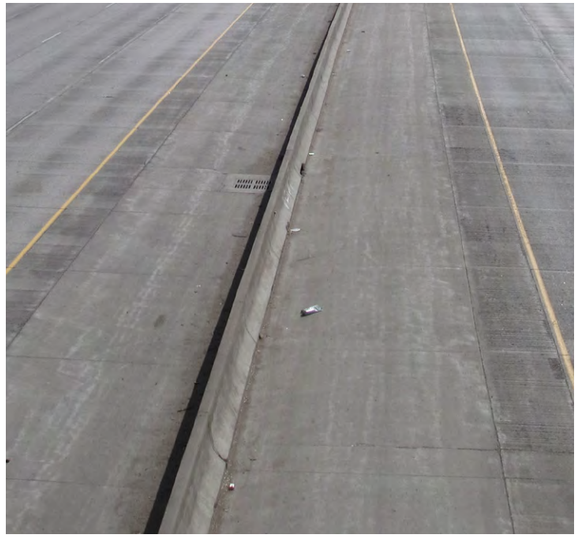
EDGES

Edge combination of guardrail and fence

Guardrail separates moving traffic from ramps

MEDIAN

Wide planted median on the east end of the corridor



Majority of the highway employs concrete jersey barriers

LANDSCAPE TREATMENT

Non-irrigated grasses along slope at interchange

Detention area lacks planting

INTRODUCTION
AESTHETIC THEMES

The I-70 corridor from I-25 to Tower Road covers about 12 miles of highway, passing through a variety of neighborhoods, historic districts, commercial districts, and new development. The changing skyline, surrounding land uses and landscapes create a series of unique scenes for drivers and surrounding neighbors. In order to create a unified aesthetic throughout the highway that will also feature local character, these guidelines include two defined themes. An East-West theme addresses the need for a unified aesthetic for highway travellers. A North-South theme defines special characteristics that can be integrated into highway elements to reflect local flavor. All elements incorporated into the I-70 East project should be designed to harmonize infrastructure with these themes and complement the surrounding neighborhoods.

CREATING AN AESTHETIC FOR TWO SPEEDS OF TRAVEL

EAST-WEST (60 MPH)

The aesthetic design of highway elements experienced from the vantage of the I-70 commuter should be expressed in a peripheral manner with an intentional focus on the horizon. The east-west experience should be unified for the traveler and create a corridor-wide identity. The design of all highway elements should be coordinated across segments to insure that future construction will define a single, unique identity for I-70 East. The pattern, color, and texture of these elements will respond to a segment's individual character within the overall theme.

Design elements should strive to be legible to motorists and passengers at posted highway speeds. At higher speeds, the details of texture must be larger, rougher, or deeper to provide the relief appropriate for creating shadow. Signage and lighting should be uncluttered and consistent.

The East-West theme for I-70 East is "From the Great Plains to the Rocky Mountains." This concept takes cues from signature Colorado landscapes representing the unique beauty of the region. The theme encourages subtle, natural transitions among the segments and their related components. The expression of this theme should come through organic forms, indigenous shapes and lines that lead to the horizon. The color palette should reference the rock, hills, rivers, and grasses that make up Colorado terrain.

Figure 7: East-West Experience

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FROM THE GREAT PLAINS TO THE ROCKY MOUNTAINS

CELEBRATION OF LANDSCAPE, NATURAL TRANSITIONS, ORGANIC FORMS, NATIVE COLOR PALETTE

Figure 8: East-West Segment Themes

NORTH-SOUTH (5-20MPH)

The aesthetic design of highway elements experienced from the north and south should be expressed so as to be visually legible to slow moving traffic and create safe environments for pedestrians and bicyclists. Attention to detail of texture and color is critical in the design approach to North-South features. These elements should be expressed as gateways entering into and representative of the surrounding communities.

The North-South theme for I-70 East is "Welcome to the Neighborhood." This theme looks to cultures, customs, art, businesses and establishments that are local to the communities through which the corridor passes. Where the East-West theme will look to the natural landscapes, the North-South theme looks to the urban and suburban communities of Colorado and the people who make the region. Transitions are more visible and apparent. The approach to form, shape, and line is urban and modern; geometric more than organic. The color palette should reference local art, housing, and community landmarks.

Figure 9: North-South Experience

WELCOME TO THE NEIGHBORHOOD

CELEBRATION OF COMMUNITY, GATEWAY TRANSITIONS, MODERN FORMS, URBAN COLOR PALETTE

Figure 10: North-South Segment Themes

CHAPTER 1
DESIGN SEGMENT 1

Segment 1 includes I-70 East from its intersection with I-25 to Brighton Boulevard. Future improvements to this segment of the corridor include re-striping and the inclusion of a toll lane. The recommendations outlined in this chapter provide aesthetic guidance for the edges, support structures, medians, frontage roads, and landscape treatment should future reconstruction of this segment take place. These recommendations will support the vision of a unified corridor and integrate any future improvements with the north-south and east-west themes of I-70 East identified in the previous chapter.

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EAST-WEST EXPERIENCE

THE ROCKY MOUNTAINS

Segment 1 celebrates the signature landscape of the Rocky Mountain state - memorable peaks and valleys, striking aspen forests, and mountain wildflowers. Stark contrasts, bold movements, and strong form are important to the character of this segment. Future opportunities for the integration of this theme may be in replacement of walls and the integration of fencing to create a more unified look that adequately expresses this trademark of the western landscape.

Textures and patterns should be memorable, repeatable, and support the Rocky Mountain theme of this segment.

COLOR SELECTION AND APPLICATION

This segment's color palette should be representative of signature colors of the rocky mountain landscape. Base Colors remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include fence posts. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

ACCENT COLORS

FS14052

FS14052

FS14052

NORTH-SOUTH EXPERIENCE

THE STOCK YARDS

The north-south experience of Segment 1 will build on the efforts of the National Western Center, enhancing the area as a regional destination and celebration of the Western way of life. This segment should incorporate both the historic culture of the stock yards as well as look to future collaborations with the Center as a way to integrate above-ground structures with the surrounding development and residential areas.

This segment will have the opportunity to create new gateways into the community, that draw inspiration from the history of this neighborhood and the pride of its community.

COLOR SELECTION AND APPLICATION

The north-south color palette should draw inspiration from local community art, historic structures, and collaborative community input. Base Colors for north-south infrastructure remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include underpass guard rails and art integration of overpass abutments. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

ACCENT COLORS

FS14052

FS14052

FS14052

Figure 11: Segment 1 Future Edge Conditions

MAP KEY

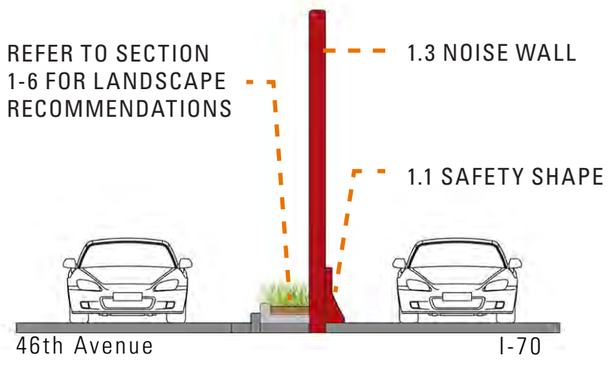
- EDGE TYPE 1-A
- EDGE TYPE 1-B
- EDGE TYPE 1-C

FUTURE EDGE CONDITIONS

Segment 1 of I-70 East will continue to have three main edge condition types. This segment transitions from an at-grade condition, where the frontage road is immediately adjacent to the highway and separated by a noise wall (Edge Type 1-A), to an elevated condition as it runs over the South Platte River (Edge Type 1-B), and terminating in a elevated condition over the railway and up to the Brighton Boulevard intersection (Edge Type 1-C). The following edge descriptions are prototypical. Edge recommendations provide a baseline condition. Any enhancements to these recommendations require coordination between the developer and CDOT and should include input from community members.

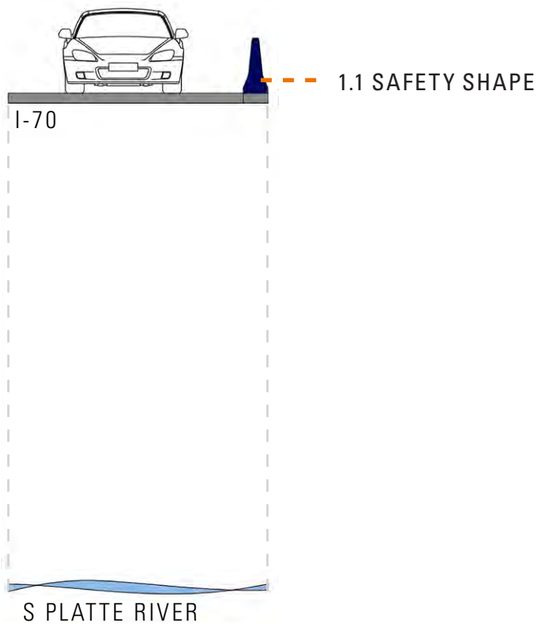
EDGE TYPE 1-A

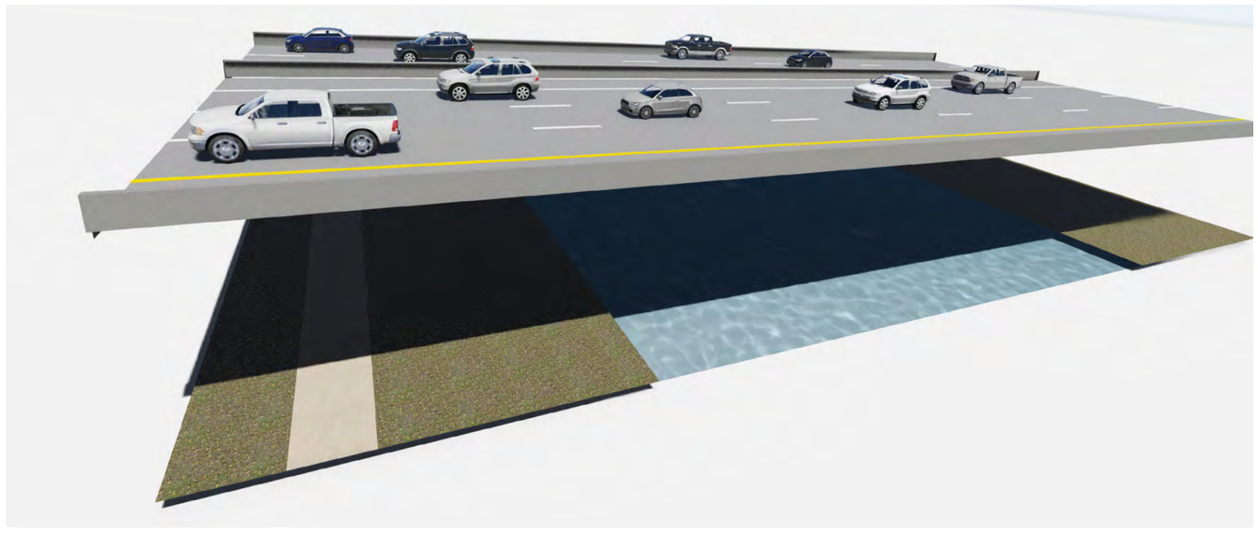
Edge Type 1-A provides a boundary between I-70 East and the local frontage road, 46th Avenue. The elements of this edge type include a safety shape and noise wall. Existing conditions on the neighborhood side of this edge condition include planters along the noise wall. Refer to Section 1-6 for landscape recommendations.



EDGE TYPE 1-B

Edge Type 1-B serves to protect travelling vehicles along an elevated portion of Segment 1 that runs over the South Platte River and associated trail. This edge includes a safety shape which acts as a barrier.





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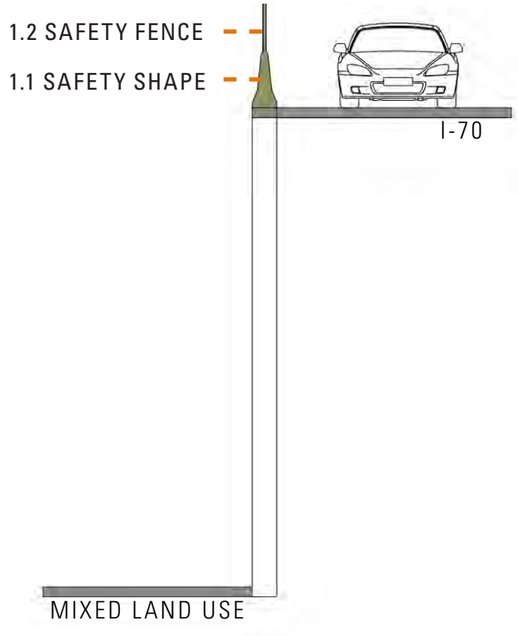
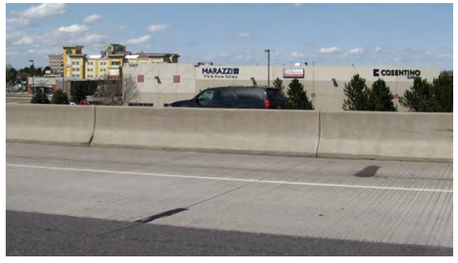


EDGE TYPE 1-C

Edge Type 1-C provides a safety shape and fencing to protect both drivers along I-70 East as well as the properties that lie below this elevated portion of Segment 1.

Safety shape at the base of a wall along I-25.



Free-standing safety shape along edge of I-70 East

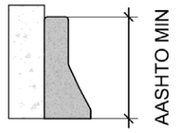
WHAT IS A SAFETY SHAPE?

Safety Shape barriers are designed to mitigate the energy of crash impacts. These barriers begin with a 3-inch vertical face at the pavement level, then break to a sloped face, changing to a nearly vertical face at the top of the barrier. The overall height is at least 34 inches above the pavement. When a vehicle impacts a safety shape barrier, a significant portion of its energy is absorbed in the climbing or lifting action that occurs when the tires roll up the lower sloping face.

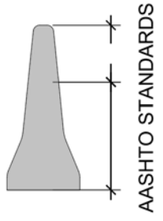
For more information about safety shapes, visit:

http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/concrete_barriers/

1.1 SAFETY SHAPE



Safety shape adjacent to noise wall.



Free standing safety shape.

EDGE RECOMMENDATIONS

1.1 SAFETY SHAPE

- Safety shapes should be designed to meet AASHTO standards.
- Color safety shapes using the recommended color palette in order to maintain consistency throughout the corridor. See Section 1-1 Theme to reference color palette.
- Utilize continuous safety shapes rather than segmented movable barriers.
- Provide edge delineation through applied markings and reflectors rather than painting bright contrasting colors on the concrete.

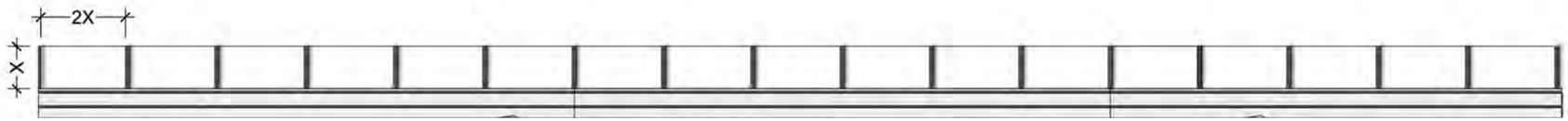
1.2 SAFETY FENCE

- The overall height of the combination of safety shape and safety fencing should meet or exceed AASHTO standards
- Safety fencing should be structurally affixed atop barrier walls where fencing is necessary per AASHTO standards
- Fencing design should be experienced in a linear, horizontal manner; to that end, the horizontal length of fence panels should not be less than 2-times the maximum vertical height of safety fences within the corridor
- Safety fence panels should "read" in a horizontal manner while meeting AASHTO standards
- Safety fence panels should be as transparent as possible; the following may be considered appropriate design criteria:
  - Use of small-gauge wire mesh fence panels in galvanized or other non-corrosive finishes (vinyl or powder coat finishes are not recommended for wire mesh panels)
  - Horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge
- Fence posts should be made of steel or aluminum material with a galvanized or otherwise non-corrosive finish
- Fence posts should not extend above the top of adjacent fence panels

1.3 NOISE WALL - HIGHWAY FACE

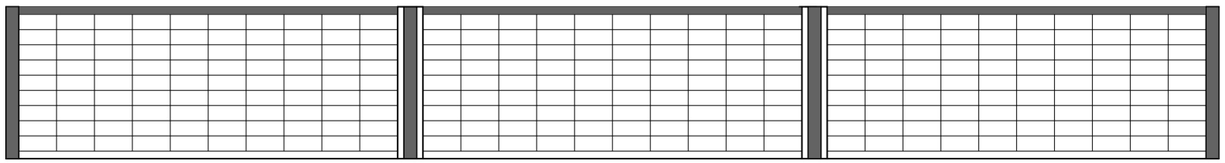
- Noise walls should employ an artist's interpretation of the Rocky Mountains as part of the overall corridor theme
- Noise wall design features should be experienced in a linear (or peripheral) manner to passing traffic; to that end, the horizontal length of design panels that are repeated should not be less than 3-times the maximum vertical height of noise walls within the segment
- Noise walls should be designed to express a base, middle and top through the use of at least two of the following:
  - Variation in vertical articulation
  - Variation in noise wall materials
  - Variation in texture
  - Variation in color
- Where possible, avoid stepping in the wall. Instead, consider setting the supports perpendicular to the topography/road grade
- Consider tapering the ends of the wall into adjacent landform or structure

SAFETY FENCE

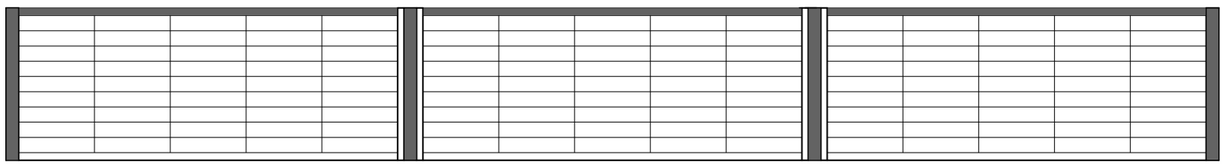


The horizontal length of fence panels should not be less than 2-times the maximum vertical height of safety fences within the corridor

MATERIAL OPTIONS



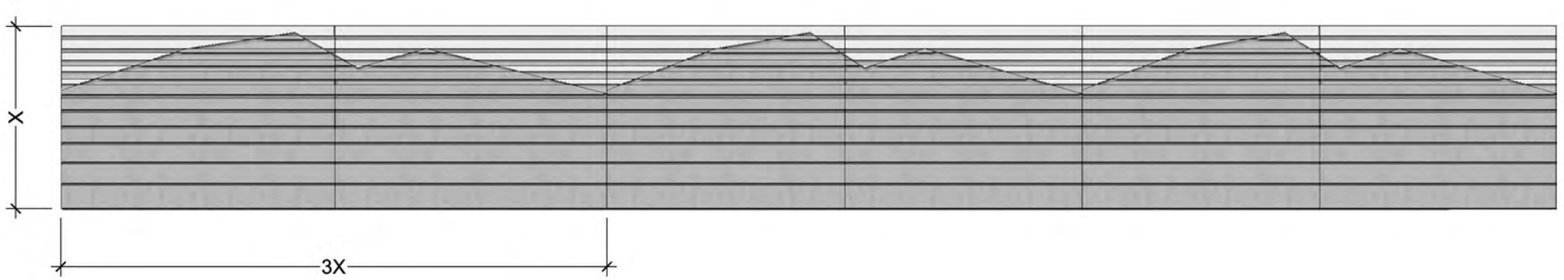
Rectangular wire mesh fence panels oriented with the larger dimension on the horizontal plane



Steel or aluminum horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge

Acrylic or other solid, transparent material

NOISE WALL - HIGHWAY FACE EXAMPLE



The horizontal length of repeated design panels should not be less than 3-times the maximum vertical height of retaining walls within the segment

Noise walls should be designed to express a base, middle and top.

Where possible, avoid stepping in the wall.

- Panel joints should be linked up and posts should be consistently spaced
- Wall treatment must be compatible with expansion joints to avoid misalignment
- Strive to place all expansion joints, weakened plane joints, on regular increments to facilitate the alignment of textures and patterns
- The top edge of the wall should be parallel with the adjacent road grade to aid in reading the wall as part of a larger architectural composition
- Steps in the top edge should be avoided. Where walls are of significantly different height, consider separating the walls with an overlap between. In some cases, the overlap need only be the width of a wall panel.
- Pre-construction mock-up should be approved by CDOT

NOISE WALL - NEIGHBORHOOD FACE EXAMPLE

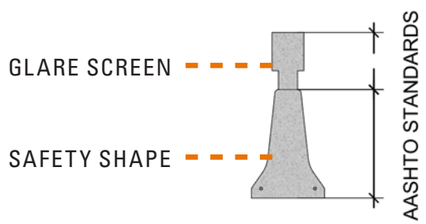
Concrete panels with large-scale mural

Modular panels with colored concrete and form-liner lettering.

NOISE WALL - NEIGHBORHOOD FACE

- Neighborhood-facing noise walls should employ an artist's interpretation of the culture or history of the Globeville neighborhood and/or National Western Center
- Neighborhood-facing noise wall design features should be designed to be experienced from the pedestrian point of view, and may include varied panel designs or interpretations; to that end, the horizontal length of individual panel designs should not exceed 1 1/2–times the maximum vertical height of noise wall in the segment
- Noise wall panels should be designed with the use of at least two of the following:
  - Variation in vertical articulation
  - Variation in retaining wall materials
  - Variation in texture
  - Variation in color
- Noisewall design may include transparent material to allow for light passage
- Permanent anti-graffiti coating should be applied to neighborhood-facing noise walls following the installation of any artwork
- Pre-construction mock-up should be approved by CDOT

SAFETY SHAPE WITH GLARE SCREEN



1-3 MEDIANS

- The presence and placement of median barriers should meet AASHTO guidelines (Roadside Design Guide, Chapter 6)
- Median barriers should incorporate both a safety shape and "glare screen" to protect vehicles travelling in opposite directions
- Glare screens should be designed so as not to appear monolithic with safety barriers below
- The use of vertical or horizontal fenestration is encouraged to provide visual interest

1-4. SUPPORT STRUCTURES

In Segment 1 there are two local street underpasses at Lincoln and Washington Streets. Should reconstruction of this segment take place in the future, developers should collaborate with CDOT to meet the following recommendations.

SUPPORT STRUCTURE RECOMMENDATIONS

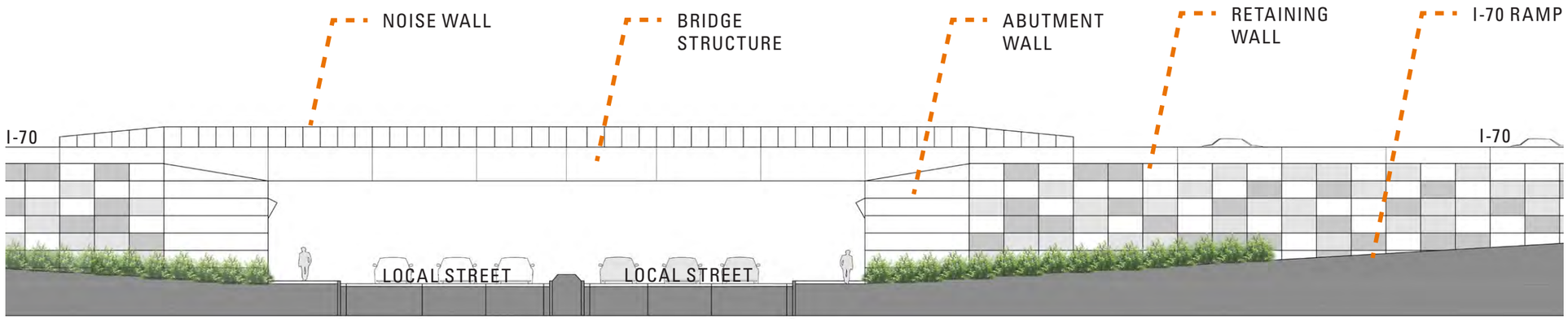
1.5 BRIDGES AND ABUTMENTS

- Bridges should incorporate low profile structural design features that appear to span across and beyond abutment walls below through the extension of noise walls.
- Bridge structural elevations should incorporate horizontal fenestration that provides simple shadow effect.
- Bridge abutment walls should be predominantly vertical.
- Bridge abutment wall design applications should extend horizontally beyond the face of the underpass opening; this extension should be equal to or greater than the height of the abutment wall.
- The treatment of abutment walls (both below the bridge structure and beyond the face of the underpass opening) should be distinctively different than that of adjacent retaining walls; this may include vertical or horizontal fenestration, changes in color or texture, interpretive artwork, or other elements that enhance the experience of approaching and driving under bridge structures.
- Abutment wall design should incorporate local aesthetics and draw inspiration from neighborhood character

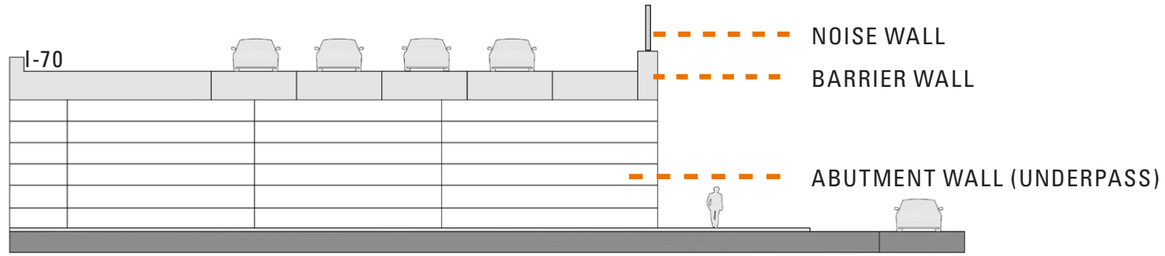
1.6 RETAINING WALLS

- Retaining walls in Segment 1 should incorporate an artistic interpretation of the north-south theme of the segment, expressing the adjacent land uses, history or culture of the area.
- Retaining wall design should incorporate a variation in fenestration, color, texture, materials, etc. so as to not appear monolithic.
- In general, retaining walls should be predominantly vertical.

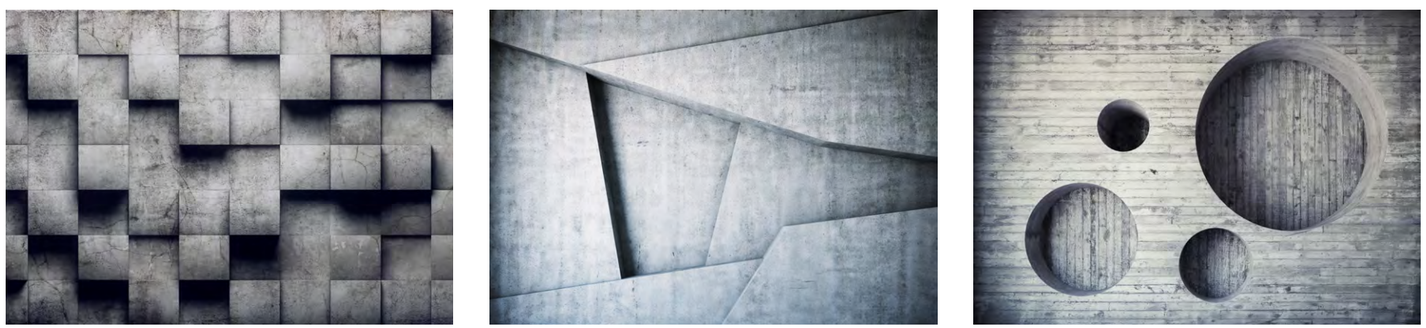
IMPLEMENTATION EXAMPLE



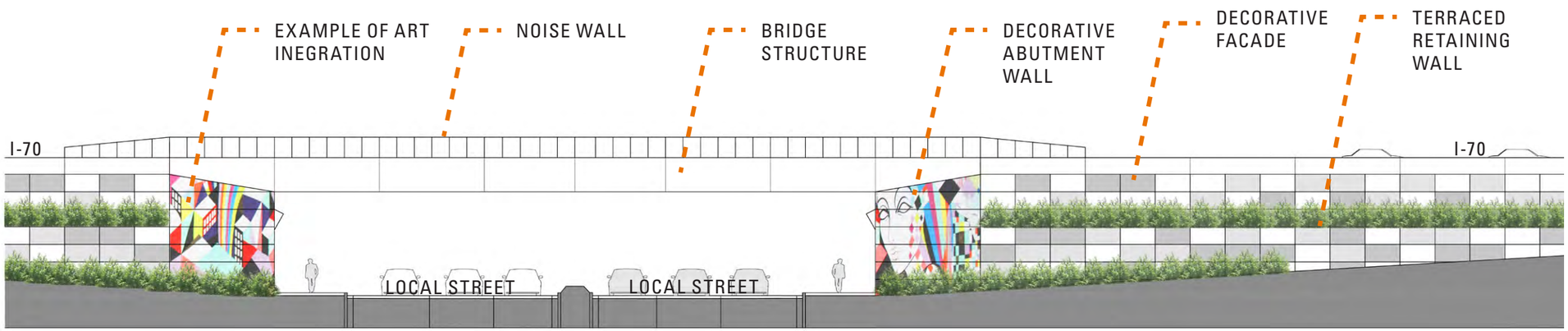
This example uses modular concrete panels with depressions and extractions that will allow for a play of light and shadow.



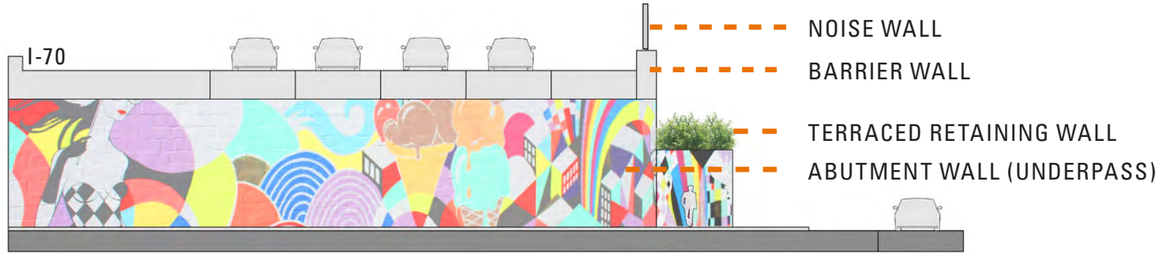
REFERENCE IMAGERY



Although these guidelines do not dictate the material for abutment walls, different applications of extrusion and depression of concrete elements could help create interesting aesthetics.



Integrating art into the bridge and underpass structures is a way to reflect the surrounding community in the built environment



Incorporating art into underpass structures provides interest for drivers and pedestrians and can serve as community way-findng devices.

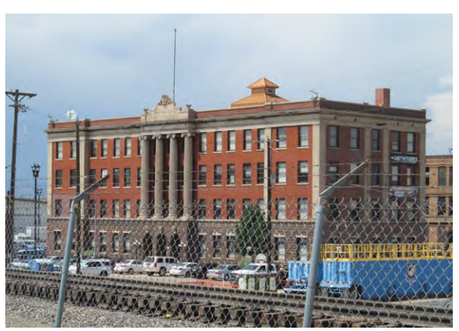
- The use of sloped paving areas as transition from retaining walls to frontage roads is to be avoided as possible.
- Should retaining walls include terracing, any raised planting should be accessible for maintenance.

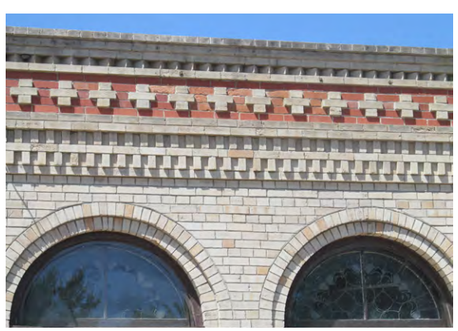
1.7 PEDESTRIAN ENVIRONMENT

Underpasses should accommodate the following pedestrian amenities:

- Sidewalk widths should be a minimum of 8'-0" in width on each side of the street
- Pedestrian lighting should be incorporated into local underpasses. Lighting poles and fixtures should be the same or complimentary to local streetscape fixtures and aesthetics and meet dark sky compliancy.

REFERENCE IMAGERY





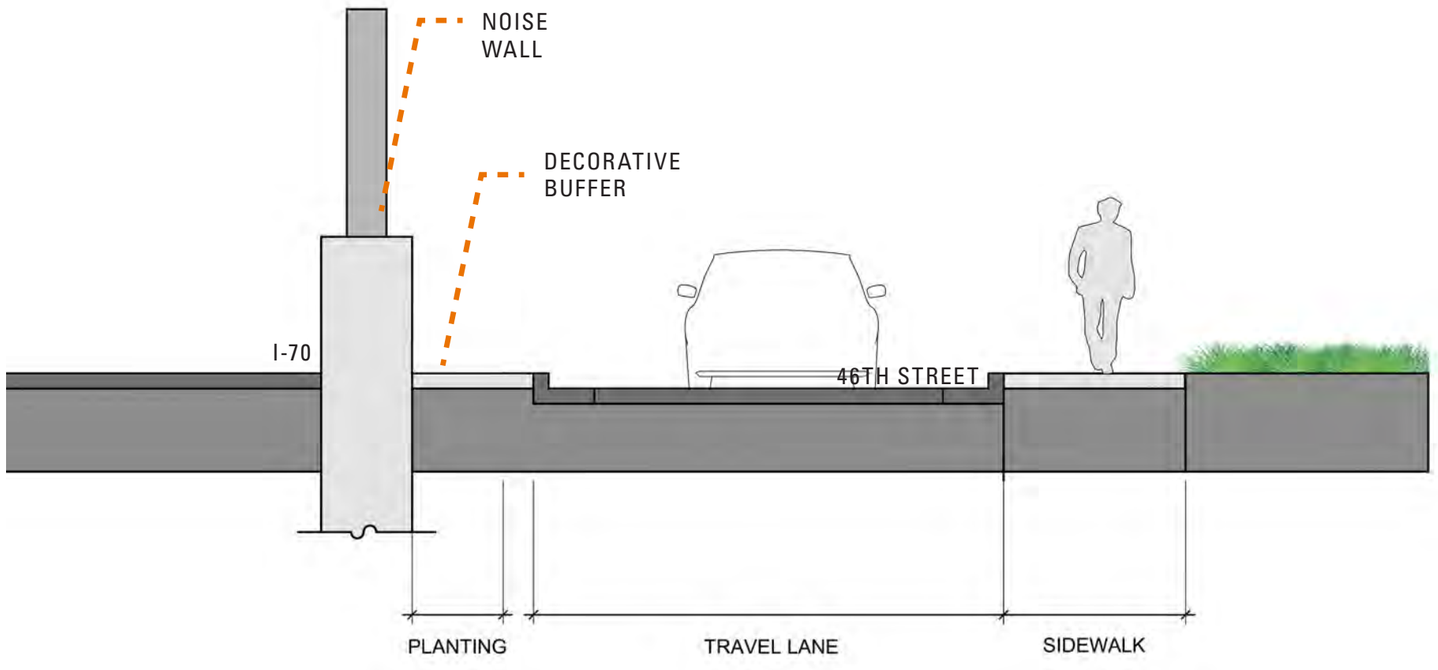
Segment one provides a rich cultural resources from local buildings, art, and landscapes to use for inspiration.

1-5. FRONTAGE ROAD

DRAFT

Figure 12: Segment 1 Future Frontage Road Conditions

The western end of Segment 1 includes a frontage road - 46th Avenue located north and south of I-70. This road provides access for local residential neighborhoods. In addition to improving the aesthetic appearance of these frontage roads for vehicles, these streets must accommodate pedestrian travel and provide safe and comfortable passage.



Example of colored stone as a decorative buffer

Figure 13: Segment 1 Future Planting Conditions

KEY

DECORATIVE BUFFER

ENHANCED LANDSCAPE

DECORATIVE BUFFER

The decorative buffer should provide a non-planted, decorative landscape between the face of wall and a local street curb. This provides visual interest along the neighborhood side of noisewalls with little maintainance or need for irrigation. The following materials may be considered for use in this area:

- Crusher fines
- 3/4" crushed granite
- Pea gravel
- Colored concrete

ENHANCED LANDSCAPE

Enhanced landscapes should create the gateway experiences for drivers and pedestrians exiting, entering, or crossing I-70 East

- Enhanced planting areas should include the following minimums in planting distribution:
  - For every 100sf of area, 5sf should be shrub planting
  - For every 100sf of area, 25sf should be native ornamental planting
  - For every 100sf of area, 70sf should be native grasses and/or wildflowers
  - 1 tree should be planted for every 1,000sf of area
  - 1/3 of all tree species should be evergreen

1-6 LANDSCAPE PLANTING

A landscape planting program will be included with every project in the corridor. The program is to be completed in partnership with agencies and communities. Landscape planting programs should include plans for landscape planting, maintenance, and funding. The I-70 East corridor is susceptible to strong winds as well as chemicals used on the roadway and adjacent lands. Soils are often poor because of the roadway construction activity. Native plant materials are suited to the local environment and their use is required by CDOT on highway corridors.

- Avoid straight lines of trees or rectangular masses. Design for natural or informal placement of plants.
- Graduate the heights of plant material as the design moves away from the roadway.
- Avoid equal or monotonous spacing of plant material. Vary the number of plants in adjoining groups. Vary the distances between accent plants.
- Group plants according to their water needs ("hydrozoning").
- Use plant material that can survive with little to no maintenance. Plants that are known to have pest or disease problems should not be used.
- When planting on slopes, place lower-water demand plants at the tops of slopes and higher-demand plants at the bottom.
- Do not completely encircle lights, signs or other roadway structures with vegetation to ensure these elements are accessible to Maintenance.

1-7. IRRIGATION

- Utilize a central control for irrigation systems and consider the use of reclaimed water, including fully treated effluent and water harvesting techniques, as a supplement to irrigation.
- Provide temporary watering for containerized native plants for a period of approximately two to three years.

CHAPTER 2
DESIGN SEGMENT 2

Segment 2 includes I-70 East from its intersection with Brighton Boulevard to Colorado Boulevard. Future improvements to this segment of the corridor will lower the highway below grade and include a landscaped highway "cover" between Clayton Street and Columbine Street. The design of the highway cover has undergone a separate design and community engagement process; final design outcomes of this portion of the highway may or may not follow the guidelines outlined in this document. The guidelines and recommendations included in this chapter provide aesthetic guidance for the edges, support structures, medians, frontage roads and landscape treatment for future improvements along this lowered segment of the highway. These recommendations will support the vision of a unified corridor and integrate future improvements with the north-south and east-west themes of I-70 East identified in the introductory chapters.

2-1. THEME

DRAFT

EAST-WEST EXPERIENCE

THE FOOTHILLS

Segment 2 represents the foothills of Colorado's Front Range. The rising landscapes, rocky outcrops, and native wildflowers that compose this landscape are reflected in the character of Segment 2's retaining walls that envelope the highway and rising noise walls.

Textures and patterns should be memorable, repeatable, and support the Foothills theme of this segment.

COLOR SELECTION AND APPLICATION

This segment's color palette should be representative of signature colors of the foothills landscape. Base colors remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include fence posts and elements of features of overpass structures. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

ACCENT COLORS

FS14052

FS14052

FS14052

NORTH-SOUTH EXPERIENCE

THE NEIGHBORHOOD

The north-south experience of Segment 2 represents the rich culture and history of the Elyria and Swansea neighborhoods. With an emphasis on local customs and the importance of the Latino heritage in this community, overpass structures become opportunities for art integration and edge features create moments of community reflection.

This segment will have the opportunity to create new gateways into the community, that draw inspiration from the history of this neighborhood and the pride of its community.

COLOR SELECTION AND APPLICATION

The north-south color palette should draw inspiration from local community art, historic structures, and collaborative community input. Base Colors for north-south infrastructure remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include overpass gateway features. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

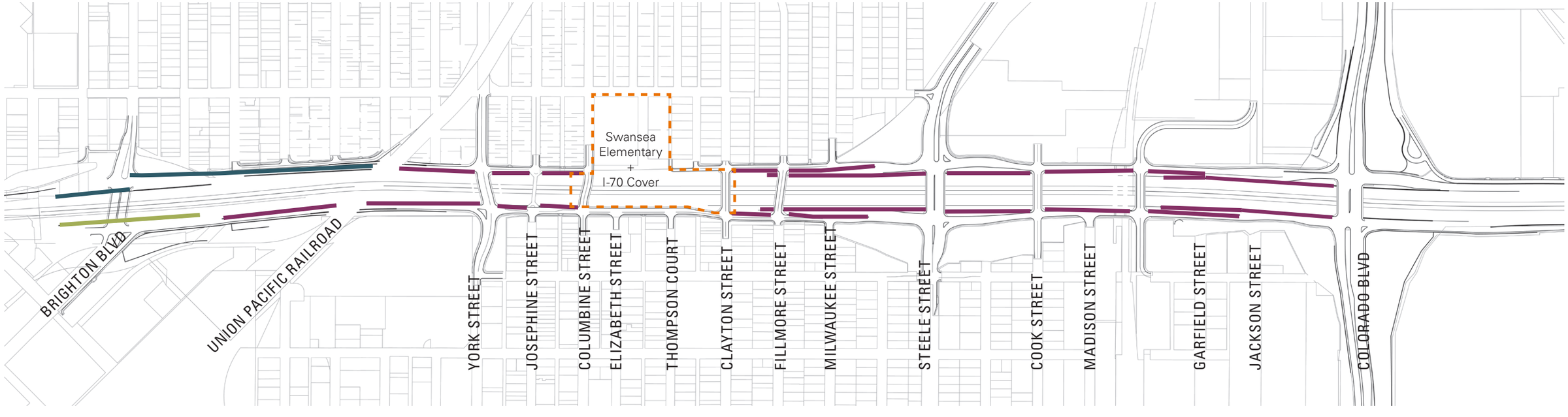
ACCENT COLORS

FS14052

FS14052

FS14052

Figure 14: Segment 2 Future Edge Conditions



MAP KEY

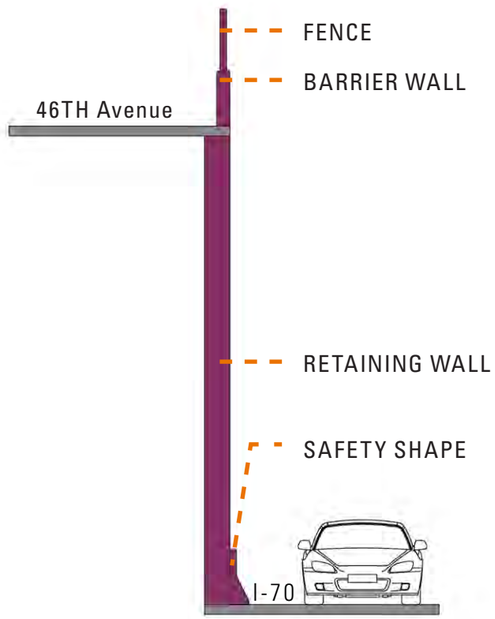
- EDGE TYPE 2-A
- EDGE TYPE 2-B
- EDGE TYPE 2-C

Segment 2 of I-70 East transitions from an elevated, above-grade condition at Brighton Boulevard, to a below-grade, lowered condition through to Colorado Boulevard. This allows for three main edge conditions within this segment.

The first type (Type 2-A) is the most common edge condition and includes a safety shape, retaining wall, additional safety shape at the adjacent street, and a fence. The second condition (Type 2-B), runs along the north side of I-70 at Brighton Boulevard and features a noise wall. The third type (Type 2-C) is located along the elevated segment at Brighton Boulevard and includes fencing and a guard rail barrier.

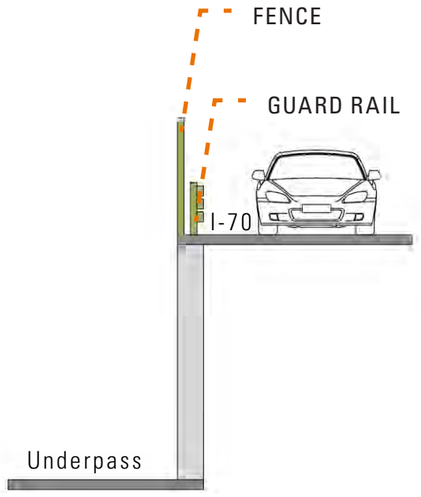
EDGE TYPE 2-A

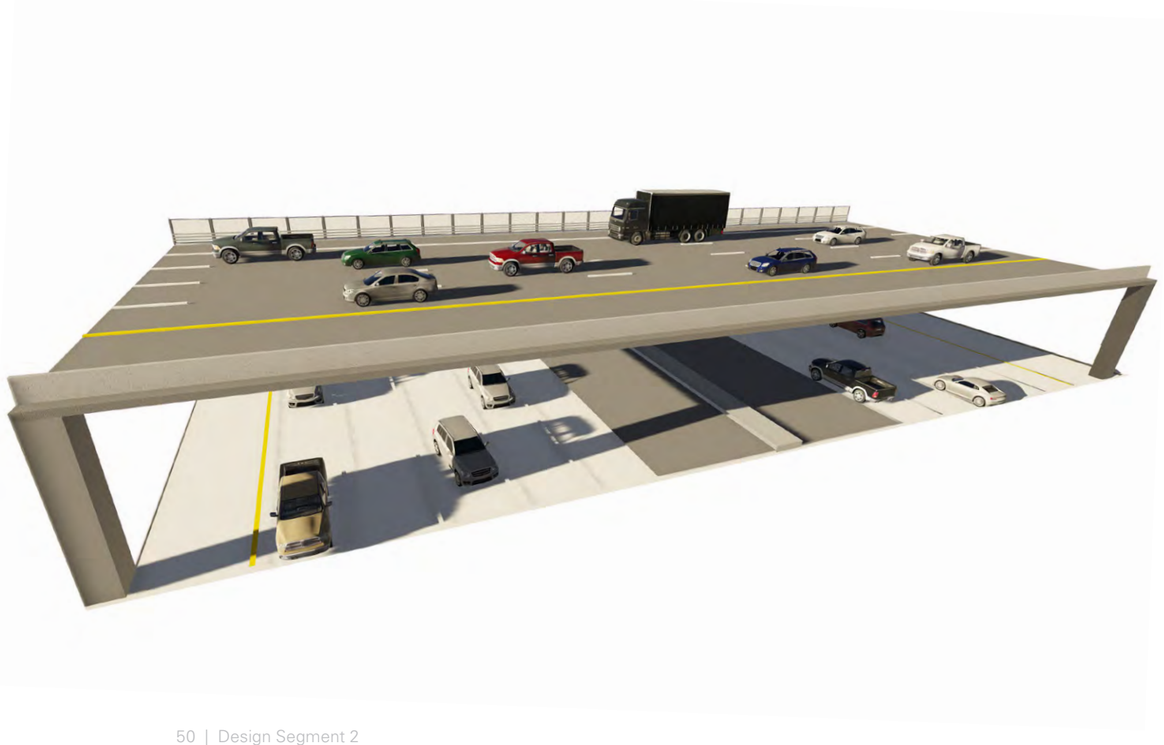
Edge Type 2-A serves as a retaining feature for the new lowered portion of the highway. This edge includes a barrier wall and safety fence along the frontage road to protect travellers on the frontage road from encroaching on the highway drop, and protects drivers below from debris above.

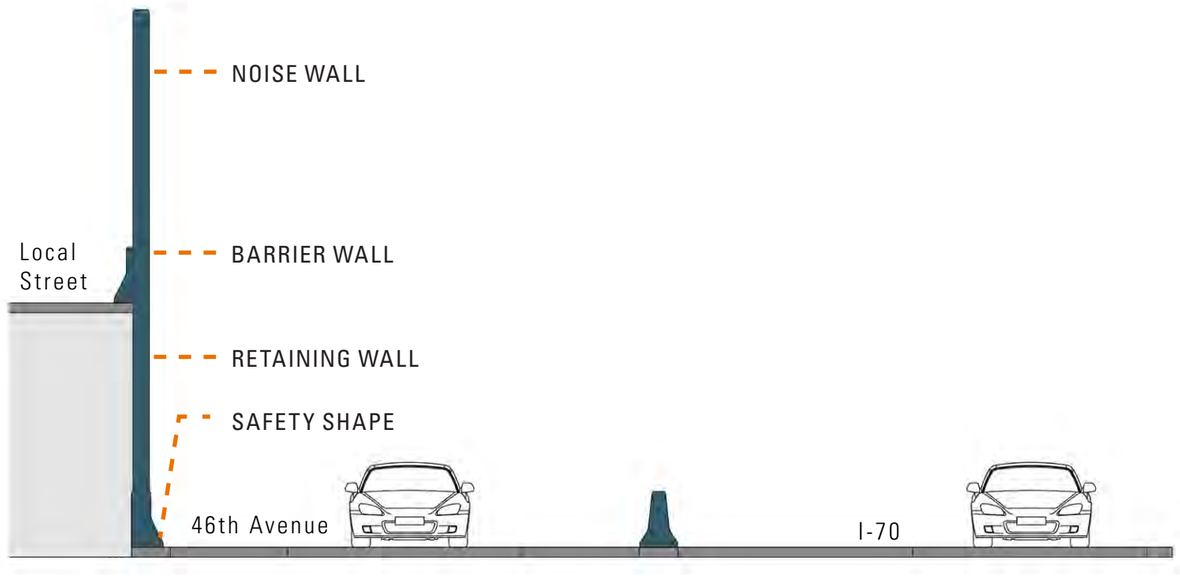


EDGE TYPE 2-B

In segment 2, Edge Type 2-B will only occur on the south side of the highway as vehicles travel over Brighton Boulevard on the decent to the lowered portion of the highway. On the south side, edge features include a guard rail and fencing to provide those travelling under the highway from any debris.







EDGE TYPE 2-C

Edge Type 2-C is a special condition that occurs where 46th Avenue runs parallel to Vine Street. In this condition, a noise wall is required for highway sound mitigation. The edge features includes in Edge Type 2-C include safety shape, retaining wall, barrier wall, and noise wall. On the highway side of this edge, all four of these elements should be integrated to read as one visual element both at grade and in conditions that include ramps.

TYPE 2-A EDGE RECOMMENDATIONS

The Type 2-A Edge facing the highway should express an artistic representation of the Rocky Mountain foothills.

2.1 SAFETY SHAPE

- Safety shapes should be designed to meet AASHTO standards.
- Color safety shapes using the recommended color palette in order to maintain consistency throughout the corridor. See Section 3-1 Theme to reference color palette.
- Utilize continuous safety shapes rather than segmented movable barriers.
- Provide edge delineation through applied markings and reflectors rather than painting bright contrasting colors on the concrete.

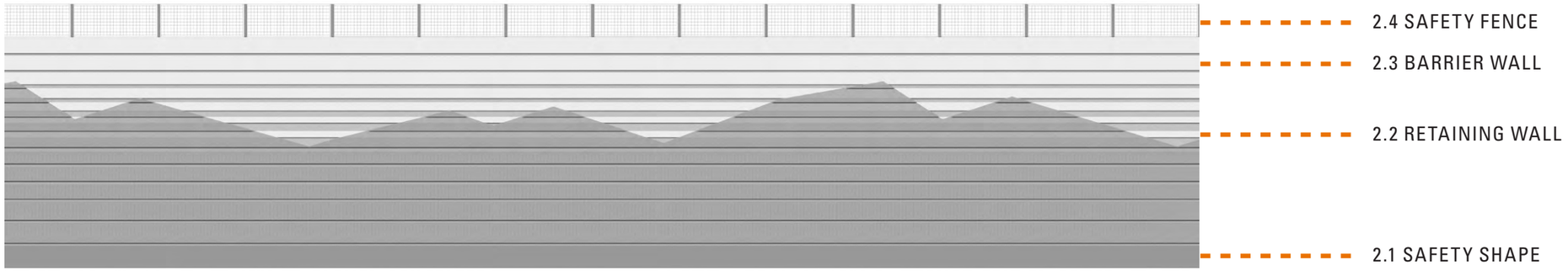
2.2 RETAINING WALL

- Retaining walls should employ an artist's interpretation of the Rocky Mountain foothills as part of the overall corridor theme
- Retaining wall design features should be experienced in a linear (or peripheral) manner to passing traffic and legible at posted traffic speeds; to that end, the horizontal length of repeated design panels should not be less than 3-times the maximum vertical height of retaining walls within the segment
- Retaining walls should be designed to express a base, middle and top through the use of at least two of the following:
  - Variation in vertical articulation
  - Variation in retaining wall materials
  - Variation in texture
  - Variation in color
- Retaining wall design should strive, to the extent possible, to provide visual consistency in top-of-wall elevations

2.3 BARRIER WALL

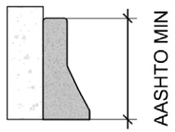
- The color and finish of barrier walls should be consistent with or complimentary to retaining walls and/or noise walls in within the segment
- Where barrier walls sit atop retaining walls, the barrier wall should be designed to vertically extend the expression of design of the retaining wall below

IMPLEMENTATION EXAMPLE



Three-dimensional, concrete panels using depression and extraction to create horizontal shadow patterns.

2.1 SAFETY SHAPE



Safety shape adjacent to retaining wall.

Safety shape at the base of a wall along I-25.

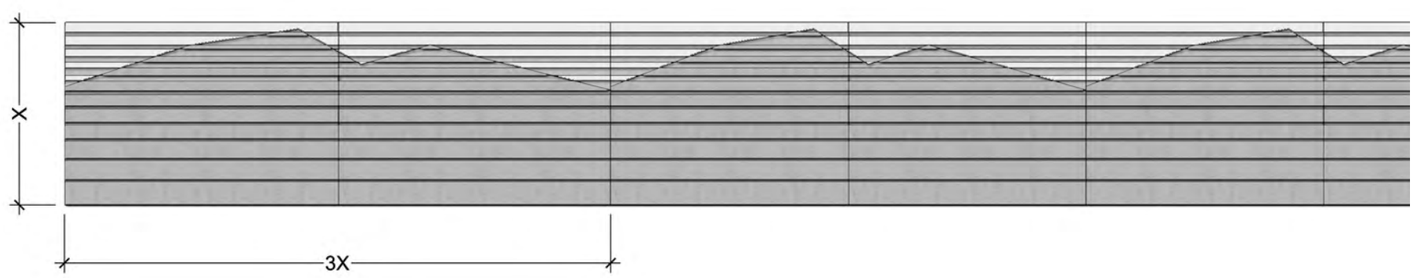
WHAT IS A SAFETY SHAPE?

Safety Shape barriers are designed to mitigate the energy of crash impacts. These barriers begin with a 3-inch vertical face at the pavement level, then break to a sloped face, changing to a nearly vertical face at the top of the barrier. The overall height is at least 34 inches above the pavement. When a vehicle impacts a safety shape barrier, a significant portion of its energy is absorbed in the climbing or lifting action that occurs when the tires roll up the lower sloping face.

For more information about safety shapes, visit:

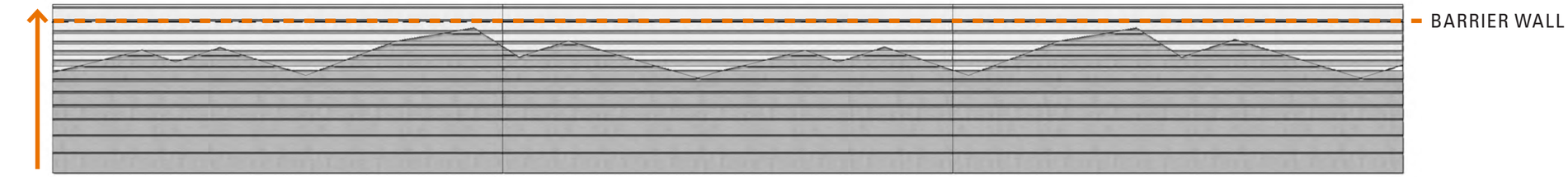
http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/concrete_barriers/

RETAINING WALL



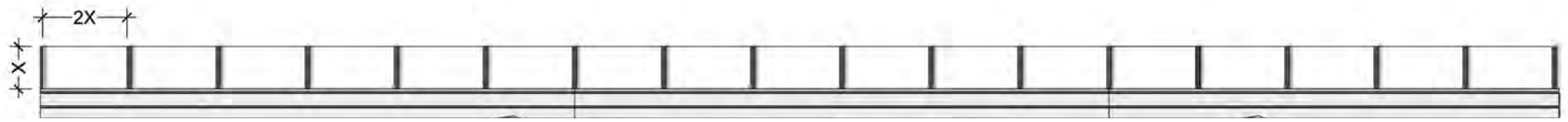
The horizontal length of repeated design panels should not be less than 3-times the maximum vertical height of retaining walls within the segment

BARRIER WALL



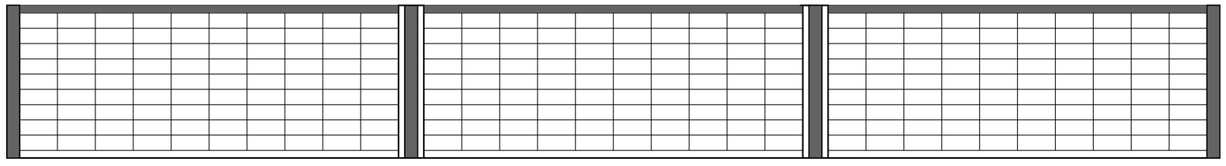
Where barrier walls sit atop retaining walls, the barrier wall should be designed to vertically extend the expression of design of the retaining wall below

SAFETY FENCE

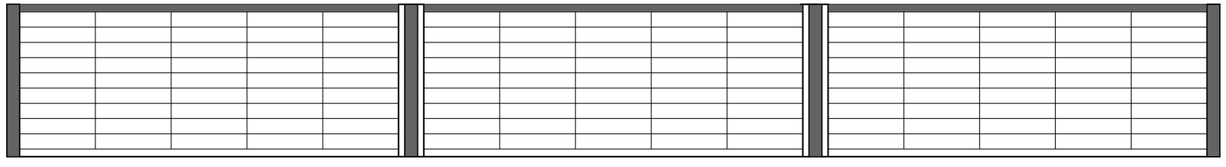


The horizontal length of fence panels should not be less than 2-times the maximum vertical height of safety fences within the corridor

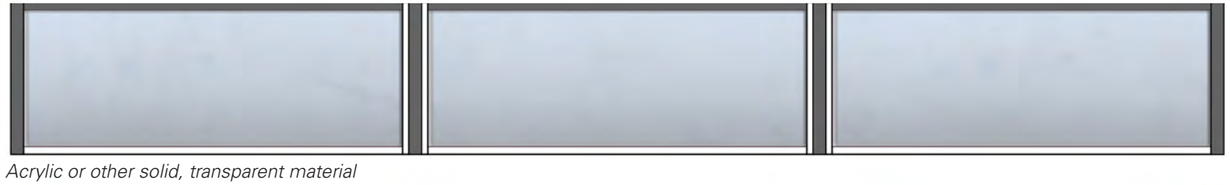
MATERIAL OPTIONS



Rectangular wire mesh fence panels oriented with the larger dimension on the horizontal plane



Steel or aluminum horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge



Acrylic or other solid, transparent material

- The face of barrier walls facing ramps and frontage roads should meet AASTO standards for safety shape design

2.4 SAFETY FENCING

- Maintain a continuous, even, or curvilinear top line along the entire length of the fence, avoiding abrupt, right-angle steps up and down.
- The overall height of the combination of barrier walls and safety fencing should meet or exceed AASHTO standards
- Safety fencing should be structurally affixed atop barrier walls where fencing is necessary per AASHTO standards
- Fencing design should be experienced in a linear, horizontal manner; to that end, the horizontal length of fence panels should not be less than 2-times the maximum vertical height of safety fences within the corridor
- Safety fence panels should "read" in a horizontal manner while meeting AASHTO standards; the following may be considered appropriate material options:
  - Rectangular wire mesh fence panels (1" x 2", 1" x 3", 2" x 4", etc.) oriented with the larger dimension on the horizontal plane
  - Steel or aluminum horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge
  - Acrylic or other solid, transparent material
- Safety fence panels should be as transparent as possible; the following may be considered appropriate design criteria:
  - Use of small-gauge wire mesh fence panels in galvanized or other non-corrosive finishes (vinyl or powder coat finishes are not recommended for wire mesh panels)
  - Horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge
  - Acrylic or other solid, transparent material
- Fence posts should be made of steel or aluminum material with a galvanized or otherwise non-corrosive finish
- Fence posts should not extend above the top of adjacent fence panels

TYPE 2-B EDGE RECOMMENDATIONS

2.5 GUARD RAIL

- Guard rails should be designed to meet AASHTO standards.
- Utilize box beam guard rails. Eliminate the use of galvanized “W” rails.
- Guard rail posts should not extend above the top beam.

TYPE 2-C EDGE RECOMMENDATIONS

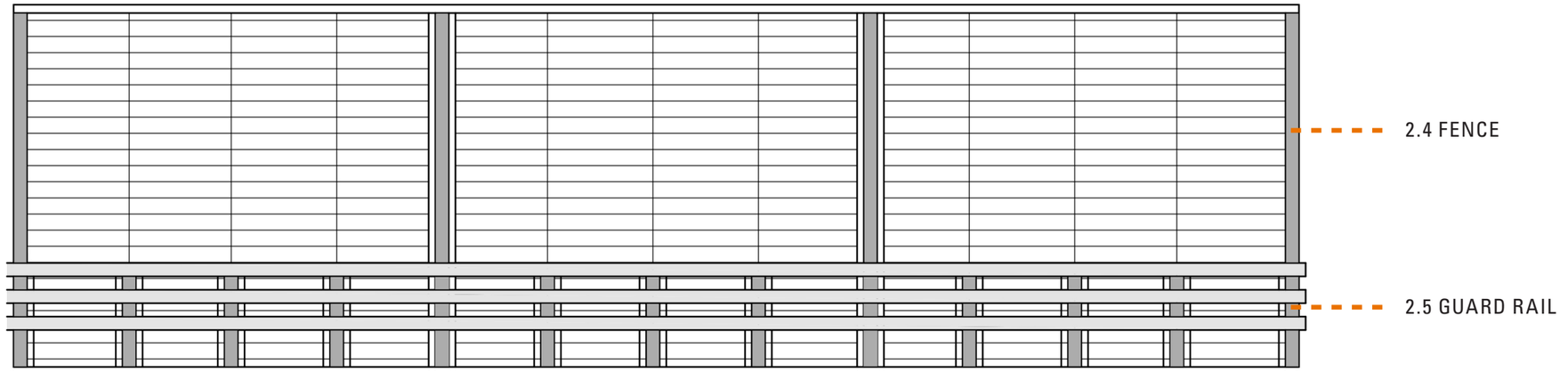
HIGHWAY

- Edge Type 2 C facing the highway should express an artistic representation of the Colorado foothills.
- Maintain a continuous, even, or curvilinear top line along the entire length of the fence, avoiding abrupt, right-angle steps up and down.
- Provide edge delineation through applied markings and reflectors rather than painting bright contrasting colors on concrete barriers.

2.6 NOISE WALL - HIGHWAY FACE

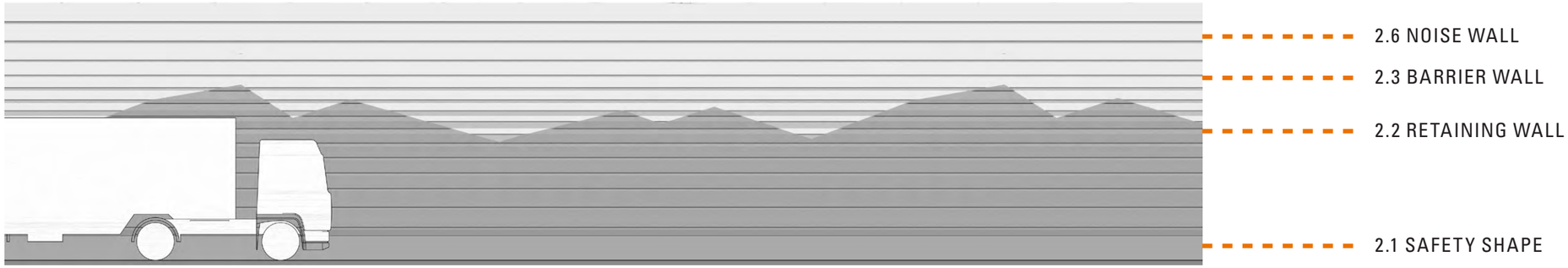
- Noise walls should employ an artist’s interpretation of the Rocky Mountain foothills as part of the overall corridor theme
- Noise walls should be designed to be consistent with the design of retaining walls within this segment
- Noise wall design features should be experienced in a linear (or peripheral) manner to passing traffic; to that end, the horizontal length of design panels that are repeated should not be less than 3-times the maximum vertical height of retaining walls within the segment
- In the event that a noise wall sits atop a retaining wall, the noise wall should be designed to vertically extend the expression of the retaining wall below
- Where possible, avoid stepping in the wall. Instead, consider setting the supports perpendicular to the topography/road grade
- Consider tapering the ends of the wall into adjacent landform or structure
- Panel joints should be linked up and posts should be consistently spaced

IMPLEMENTATION EXAMPLE



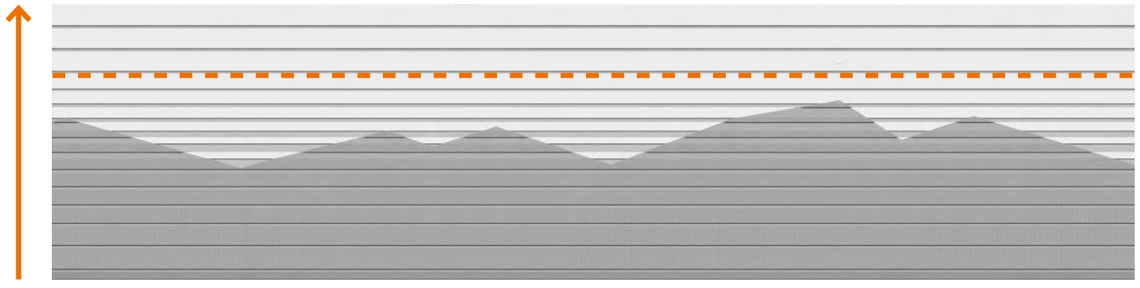
Fencing along Edge 3 should meet minimum AASHTO minimum height requirements.

IMPLEMENTATION EXAMPLE



Three-dimensional, concrete panels using depression and extraction to create horizontal shadow patterns.

NOISE WALL - HIGHWAY FACE



In the event that a noise wall sits atop a retaining wall, the noise wall should be designed to vertically extend the expression of the retaining wall below

NOISE WALL EXAMPLES- NEIGHBORHOOD FACE

Concrete panels with large-scale mural to be designed by a local artist.

Modular panels with colored concrete and form-liner lettering.

The Elyria and Swansea neighborhoods have expressed interest in future aesthetics of this project. For more information on community concepts for design features, refer to the 2015 Elyria & Swansea Neighborhoods Plan:

https://www.denvergov.org/Portals/646/documents/planning/Plans/elyria_swansea/Elyria_Swansea_Neighborhood_Final_Web_sm.pdf

- Wall treatment must be compatible with expansion joints to avoid misalignment
- Strive to place all expansion joints, weakened plane joints, on regular increments to facilitate the alignment of textures and patterns
- The top edge of the wall should be parallel with the adjacent road grade to aid in reading the wall as part of a larger architectural composition
- Steps in the top edge should be avoided. Where walls are of significantly different height, consider separating the walls with an overlap between. In some cases, the overlap need only be the width of a wall panel.
- Pre-construction mock-up should be approved by CDOT

NOISE WALL - NEIGHBORHOOD FACE

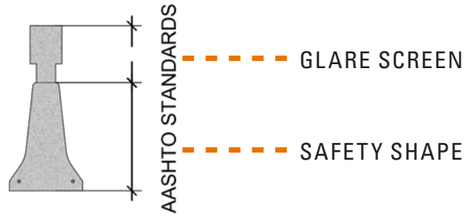
- Noise walls may be designed to incorporate safety shape design within the base of the wall, or may be placed atop separately-cast safety shapes.
- Neighborhood-facing noise walls should employ an artist's interpretation of the culture or history of the Elyria and Swansea neighborhoods
- Neighborhood-facing noise wall design features should be designed to be experienced from the pedestrian point of view, and may include varied panel designs or interpretations; to that end, the horizontal length of individual panel designs should not exceed 1 1/2–times the maximum vertical height of noise wall in the segment
- Noise wall panels should be designed with the use of at least two of the following:
  - Variation in vertical articulation
  - Variation in retaining wall materials
  - Variation in texture
  - Variation in color
- Noisewall design may include transparent material to allow for light passage
- Permanent anti-graffiti coating should be applied to neighborhood-facing noise walls following the installation of any artwork
- Pre-construction mock-up should be approved by CDOT

2-3. MEDIANS

MEDIAN RECOMMENDATIONS

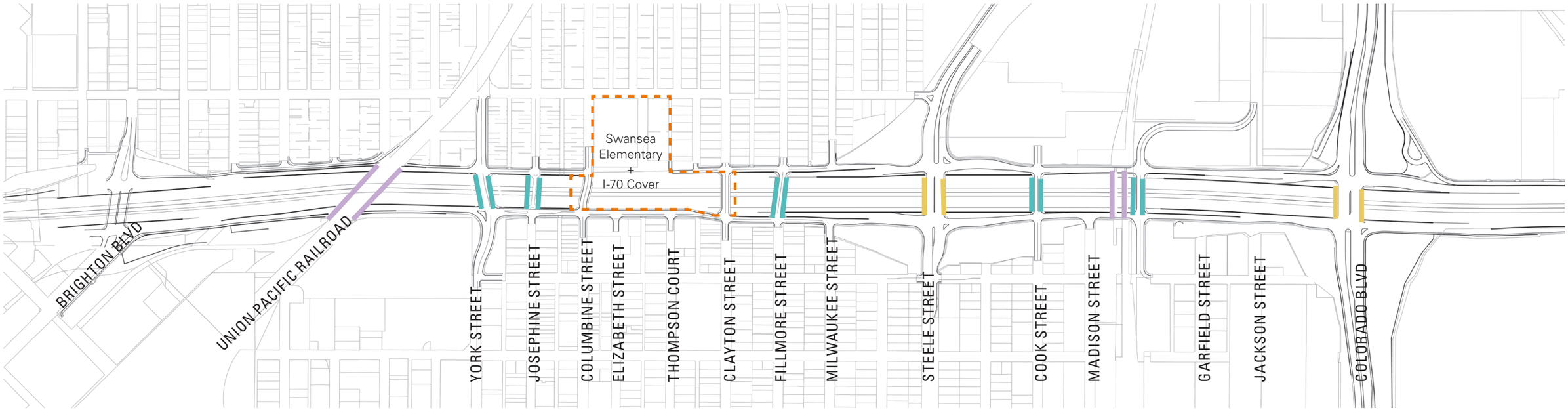
- The presence and placement of median barriers should meet AASHTO guidelines (Roadside Design Guide, Chapter 6)
- Median barriers should incorporate both a safety shape and “glare screen” to protect vehicles travelling in opposite directions
- Glare screens should be designed so as not to appear monolithic with safety barriers below
- The use of horizontal fenestration is encouraged to provide visual interest

SAFETY SHAPE WITH GLARE SCREEN



2-4. SUPPORT STRUCTURES

Figure 15: Segment 2 Future Bridge Conditions

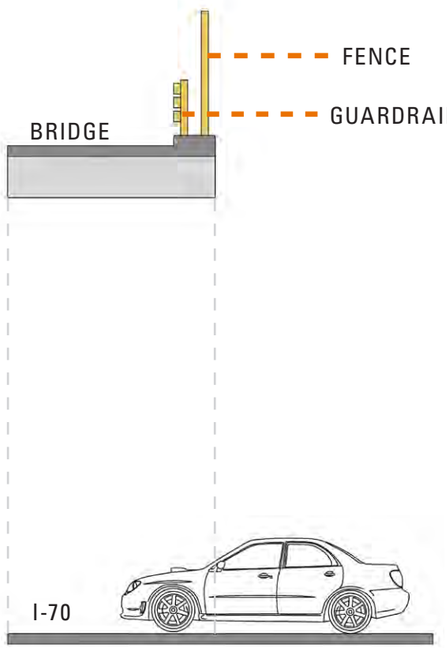


MAP KEY

BRIDGE TYPE 2-A

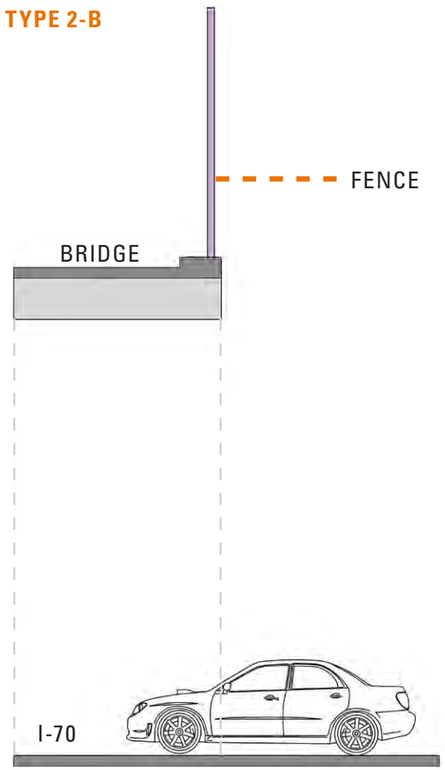
BRIDGE TYPE 2-B

TYPE 2-A



Type 2-A bridges should serve at community gateways for the major roadways and significant north-south crossings. These bridges should be amenitized to safely and comfortably serve pedestrians and bicyclists as well as vehicles travelling over I-70 East.

TYPE 2-B



Bridge Type 2-B will serve heavy rail bridges and requires fencing along the bridge that will protect highway travellers below from any debris along the rail. The aesthetics of this fencing should be the same or complimentary to the fence types along Bridge Types 2-A and 2-B.

Type 2-A bridges require a guard rail and fence, similar to the existing bridges over I-25

SUPPORT STRUCTURE RECOMMENDATIONS

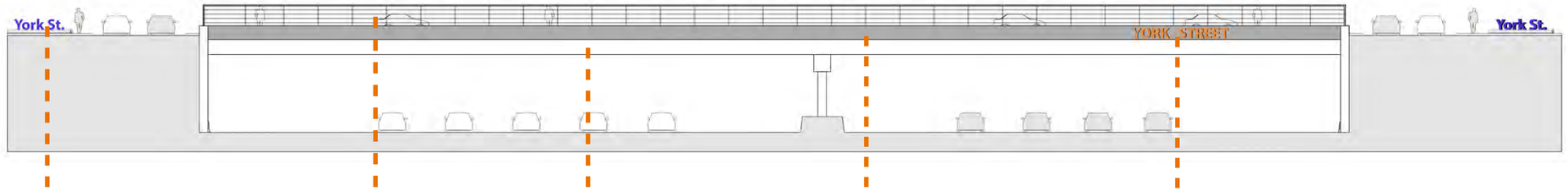
A hierarchy of bridge design should be incorporated to reflect the difference in street classification of north-south streets, allowing for higher-volume and higher-speed streets to comfortably accommodate both vehicular and pedestrian traffic and for local streets to elevate the quality of the environment for pedestrians and cyclists.

Road bridges are classified into two standard types: Type 2-A and Type 2-B, which will accommodate the heavy rail tracks between Brighton and York Streets, and Cook and Garfield Streets. Not included in this classification are the bridges at Columbine and Clayton Streets, which are to be designed according to the expectations set forth in the I-70 Highway Cover Conceptual Design.

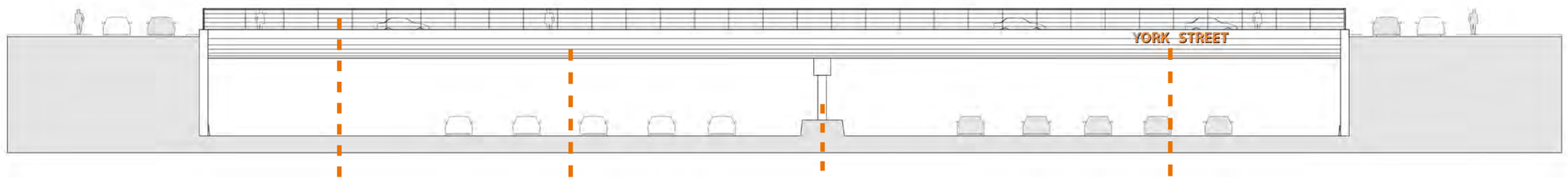
2.7 BRIDGES AND ABUTMENTS

- Bridges should incorporate low-profile design features that accentuate vistas to the horizon
- Bridge structural elevations should incorporate horizontal fenestration that provides simple shadow effect
- Bridge structural elevations should horizontally align with top-of-retaining wall elevations where possible
- Bridge abutments should be predominantly vertical and align with adjacent retaining walls where possible
- Bridge abutment design should provide a consistency in materials/color/texture with adjacent retaining walls
- Bridge color should be consistent with the Segment 2 color palette
- A combination of box beam guardrail and decorative fencing should be used at the outside edges of bridges to provide a barrier between the pedestrian zone and the highway below
- Decorative fencing should be use as the outer barrier, and should be a minimum of 6'-0" in height as measured from the sidewalk elevation
- Decorative fencing should incorporate a simple design, with a regular cadence of vertical members supported by minimal horizontal members
- Decorative fencing should have a powdercoat finish in a color that minimizes the visual impact of the fence from the highway
- Box beam guardrail should be used at the inside of decorative fencing, and should not exceed 34"in height
- The cadence of vertical box beam guardrail members should align with that of the adjacent decorative fencing
- Box beam guardrail should have a powdercoat finish in a color that matches the adjacent decorative fencing
- Bridge design should be consistent throughout the segment and corridor
- Bridge elevations may include low-profile gateway elements, either horizontally or vertically, to express the name of the cross-street and/or neighborhood identification; these gateway elements should be located to the right side of the bridge structure as viewed from highway traffic below

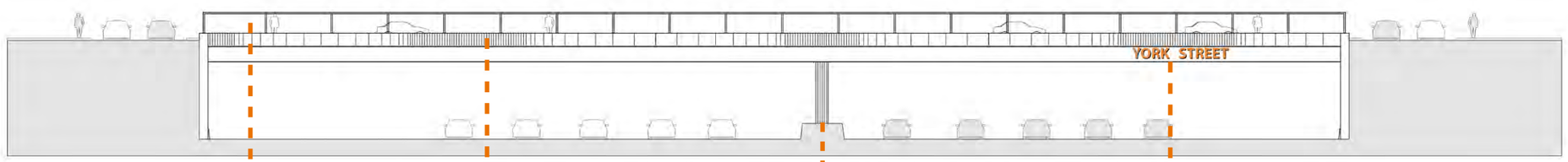
IMPLEMENTATION EXAMPLES



COMMUNITY GATEWAY | DECORATIVE FENCE | EXPOSED GIRDER | SIMPLE CONCRETE BRIDGE | OVERPASS IDENTIFICATION



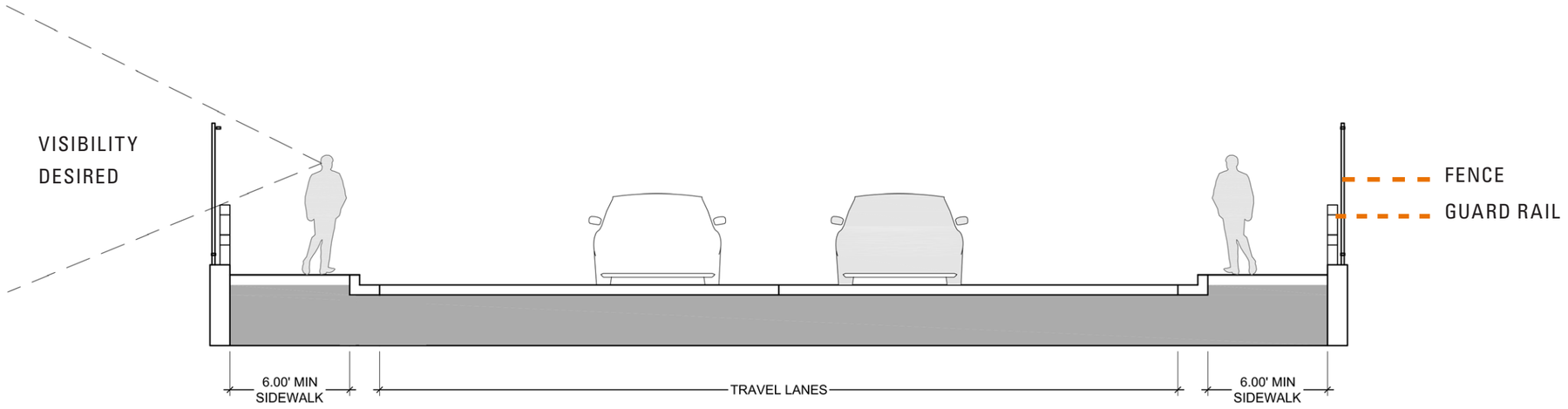
DECORATIVE FENCE | CONCRETE BRIDGE MIMICS RETAINING WALL AESTHETIC | SIMPLE CENTRAL COLUMN | OVERPASS IDENTIFICATION



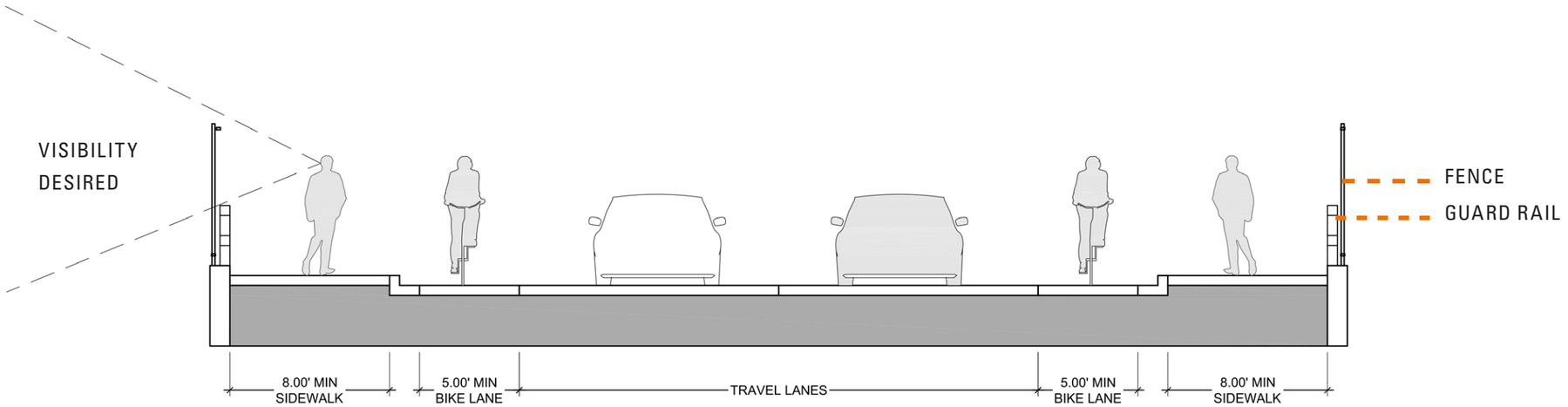
TRANSPARENT FENCING | CONCRETE BRIDGE INCORPORATES ARTISTIC IMPRESSION OF ADJACENT COMMUNITY | DECORATIVE CENTRAL COLUMN | OVERPASS IDENTIFICATION

DRAFT

RECOMMENDED BRIDGE SECTION



RECOMMENDED SECTION WITH BIKE FACILITIES



2.8 PEDESTRIAN ENVIRONMENT

- Type 2-A bridges should accommodate 6'-0" minimum sidewalk widths on each side of the street
- Where bike facilities are planned for bridges, bicycle accommodations should meet guidelines as described in the following documents:
  - Denver Moves: Enhanced Bikeways

    https://www.denvergov.org/bikeprogram/bicyclingindenver/streetsandtrails/planning/tabid/438250/default.aspx
  - City and County of Denver Streetscape Design Manual (1993)

    http://www.denvergov.org/Portals/646/documents/Zoning/other_regulations/DesignGuidelines_StreetscapeDesign_1993.pdf

2.9 SUPPORT STRUCTURE LIGHTING

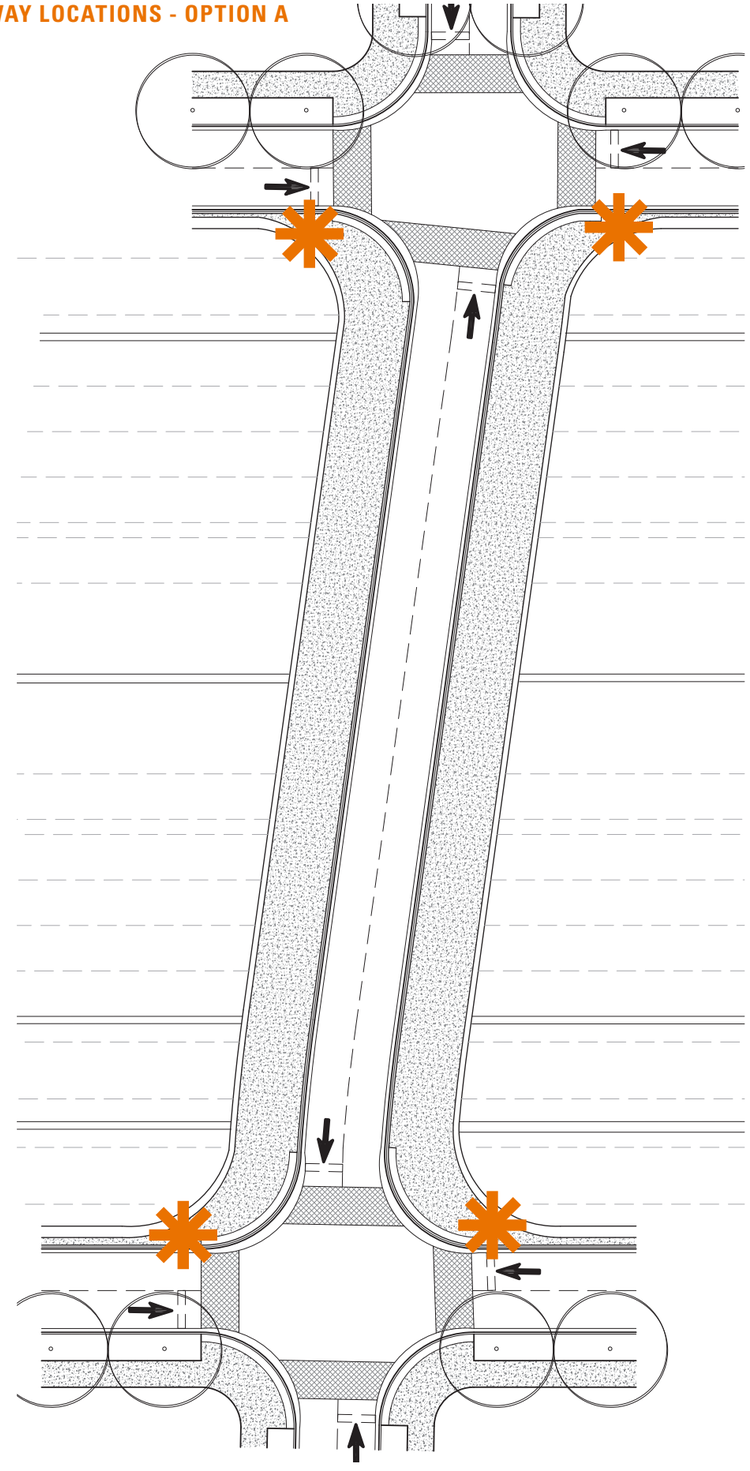
- Lighting of the bridge structure should provide adequate pedestrian lighting levels across the bridge while minimizing the intrusion of bridge lighting on the highway below
- Where possible, lighting of the pedestrian walkways should be incorporated in to adjacent decorative fencing or concrete barriers
- Pedestrian lighting elements should not exceed the height of decorative fencing along the bridge
- Street lighting should be minimized to the extent possible on bridge structures
- Where necessary, street lighting fixtures should be of a simple design and meet dark sky compliancy.

2.10 COMMUNITY GATEWAYS

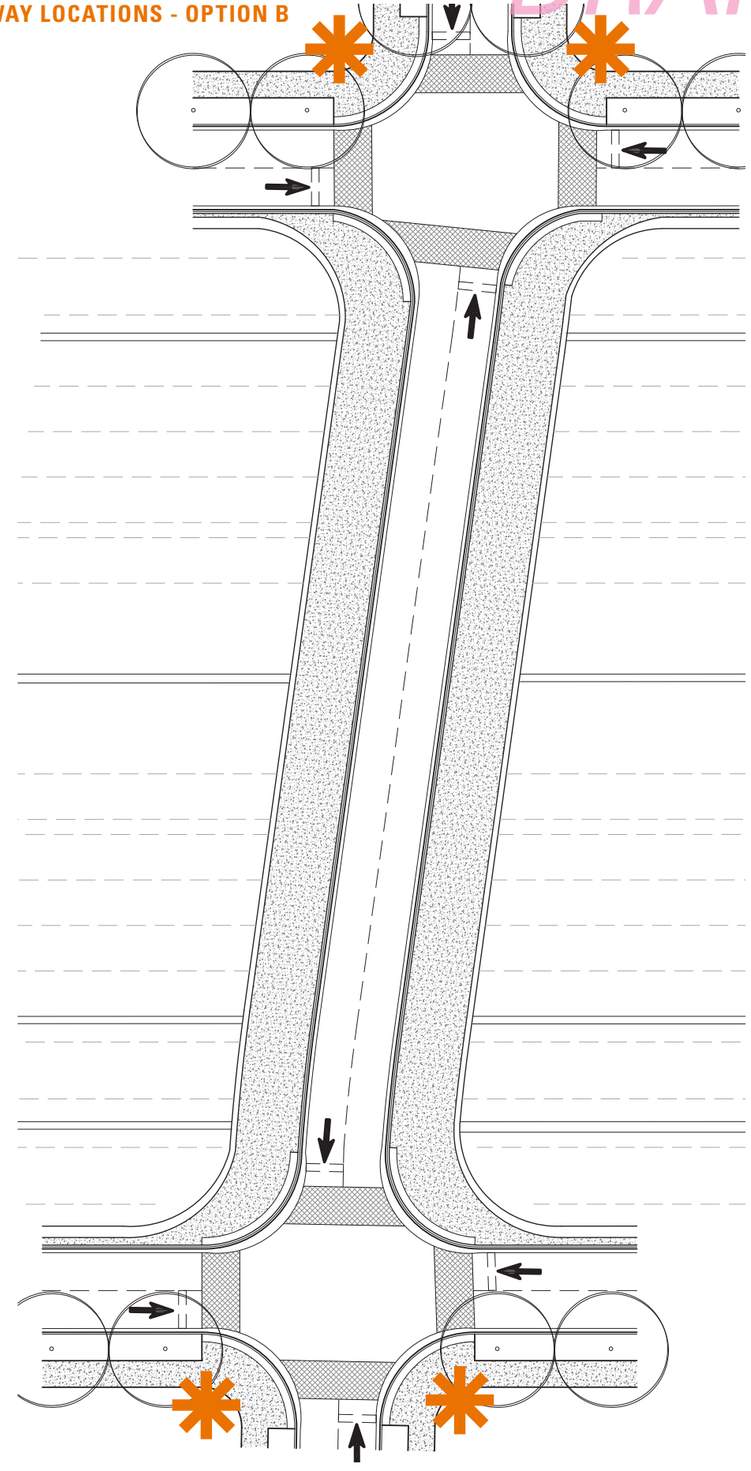
- Design community gateways in partnership with surrounding residents, businesses, and agencies to create a transition from the highway corridor to surrounding communities
- Fully integrate gateway features into local context and surrounding elements
- Gateway features should be composed of high quality and durable materials
- Location of gateway features should be determined by:
  - Availability of space on bridge structures
  - Potential for integration of gateway feature into bridge, guardrail, or fencing structures
  - Community input
- Should the selected gateway feature design be too large for bridge structure integration, locations of such features will be on adjacent frontage road.
- Design of gateway features will include coordination with developer, CDOT, and the City and include community input.
- References available include: Design Guidelines for Denver Gateways:

http://www.denvergov.org/Portals/646/documents/Zoning/other_regulations/Gateway%206-26-13.pdf

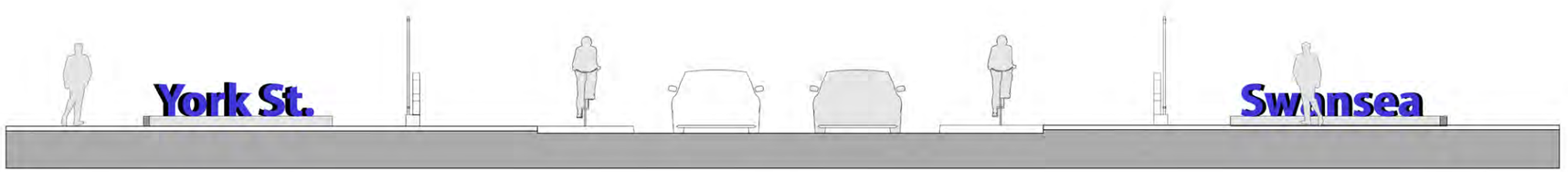
GATEWAY LOCATIONS - OPTION A



GATEWAY LOCATIONS - OPTION B

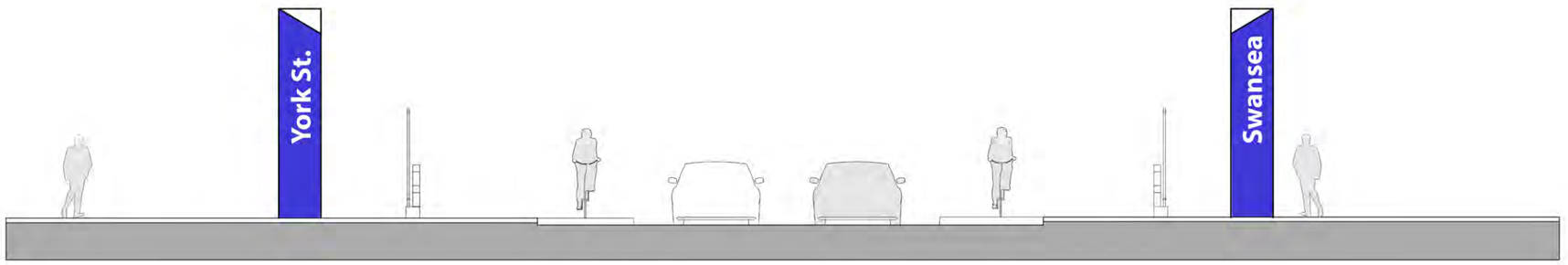


GATEWAY IMPLEMENTATION EXAMPLE



Horizontal community gateways associated with bridges indicate local neighborhood and street and incorporate artistic interpretation of Segment 2 theme

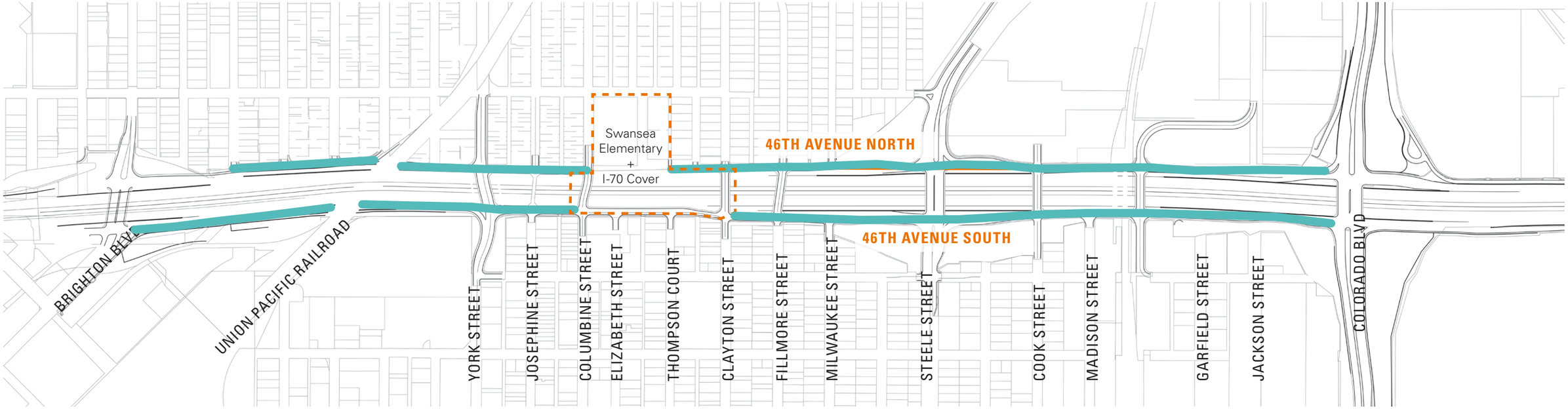
GATEWAY IMPLEMENTATION EXAMPLE



Vertical community gateways associated with bridges indicate local neighborhood and street and incorporate artistic interpretation of Segment 2 theme

2-5. FRONTAGE ROAD

Figure 16: Segment 2 Future Frontage Road Conditions



Frontage roads in Segment 2 play an important role in the I-70 East corridor. Of all four segments, Segment 2 has the highest percentage of adjacent residential properties. In order to respond to this, frontage roads within this segment must accommodate pedestrian travel and provide safe and comfortable passage.

The frontage road guidelines in Segment 2 provide accommodations for pedestrians and allow for a decorative buffer between the frontage road and highway edge. This frontage road will also interact with the I-70 East highway cover. The road along the cover will be a highly amenitized condition that occurs between Columbine and Clayton Streets. Refer to FEIS Appendix P *Cover Planning* for more information.

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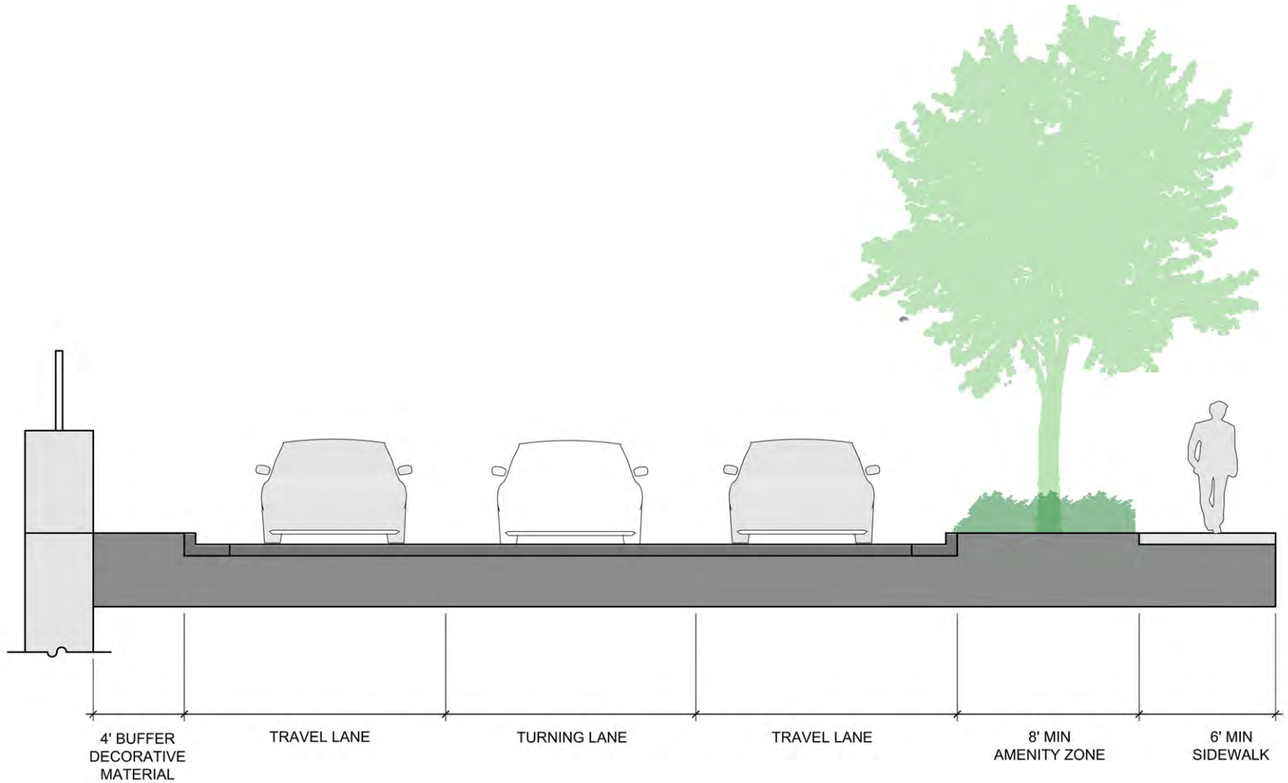
PREFERRED FRONTAGE ROAD SECTION



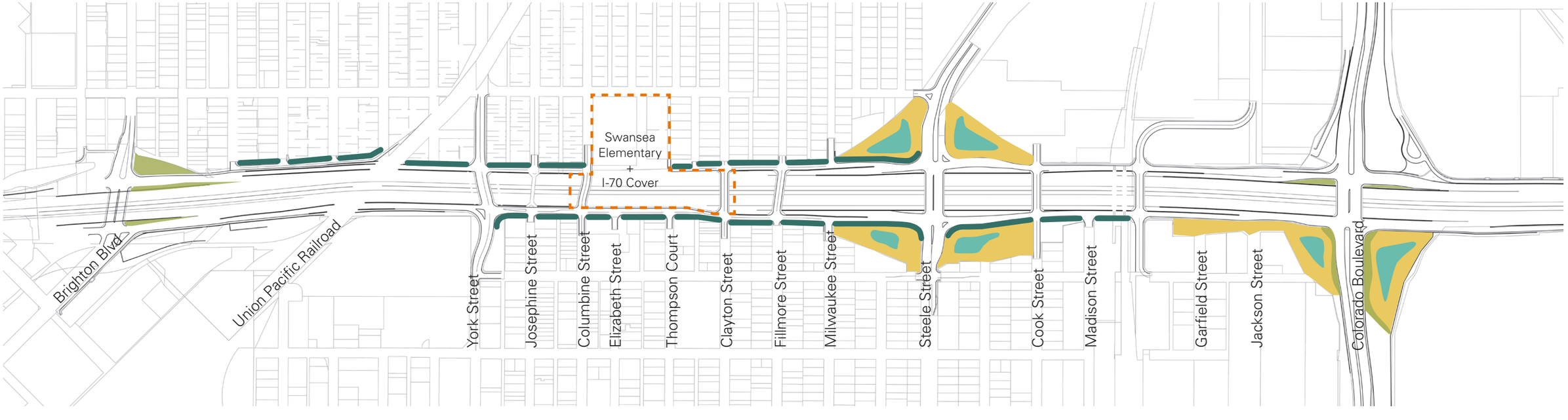
FRONTAGE ROAD RECOMMENDATIONS

2.11 STREETSCAPE

- Create an inviting pedestrian environment by including the following amenities
  - Planted amenity zones
  - Street trees - refer to section 2-6 Landscape Treatment for more information on street trees and streetscape planting
  - Seating whose aesthetic characteristics are integrated with neighborhood character and receive community approval
  - Pedestrian lighting whose aesthetic characteristics are integrated with neighborhood character and receive community approval.
- Frontage road streetscapes should meet standards as described in City and County of Denver Streetscape Design Manual (1993)

http://www.denvergov.org/Portals/646/documents/Zoning/other_regulations/DesignGuidelines_StreetscapeDesign_1993.pdf

Figure 17: Segment 2 Future Planting Conditions



KEY

- STREETSCAPE PLANTING
- ENHANCED LANDSCAPE
- DETENTION PLANTING
- NATURALIZED PRAIRIE

STREETSCAPE PLANTING

- Planting along frontage roads should create unified identity for Segment 2 and relate to surrounding neighborhoods
- Trees must be provided within amenity zone and/or tree lawn at equal spacing by species, with minor adjustments for utilities or species impact
- Average tree spacing shall be 30-feet on center
- Tree planting should meet City of Denver forestry recommendations for species diversity
- Tree species must be on the Approved Street Tree List for Denver's Public Rights-of-way: http://www.denvergov.org/Portals/747/documents/forestry/Street_tree_guide.pdf

ENHANCED LANDSCAPE

Enhanced landscapes should create the gateway experiences for drivers and pedestrians exiting, entering, or crossing I-70 East

- Enhanced planting areas should include the following minimums in planting distribution:
  - For every 100sf of area, 5sf should be shrub planting
  - For every 100sf of area, 25sf should be native ornamental planting
  - For every 100sf of area, 70sf should be native grasses and/or wildflowers
  - 1 tree should be planted for every 1,000sf of area
  - 1/3 of all tree species should be evergreen

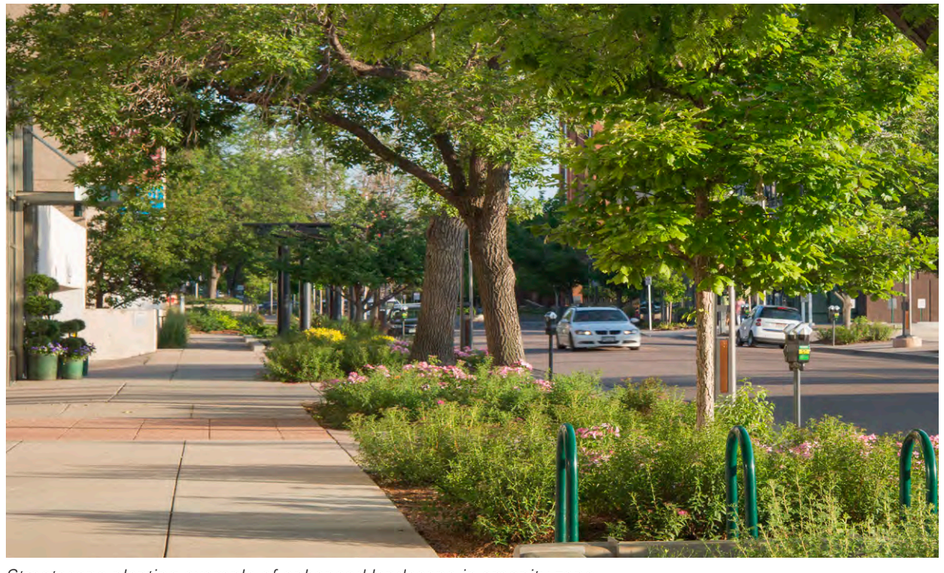
DETENTION PLANTING

- Recommendations on appropriate trees, shrubs, and seed mixes can be found in the UDFCD Drainage Criteria Manual http://www.udfcd.org/downloads/down_critmanual_volIII.htm
- Use native grasses on side slopes of less than 3:1 for ease of maintenance and detention functionality
- Steep slopes greater than 3:1 should be planted with shrubs and/or groundcovers that do not require mowing. Select plant species that produce dense, fibrous roots to help prevent soil erosion.
- Trees are not recommended on side slopes greater than 4:1
- Planting should be designed with attractive natural-looking features.
- Select plants which do well with little or no maintenance.

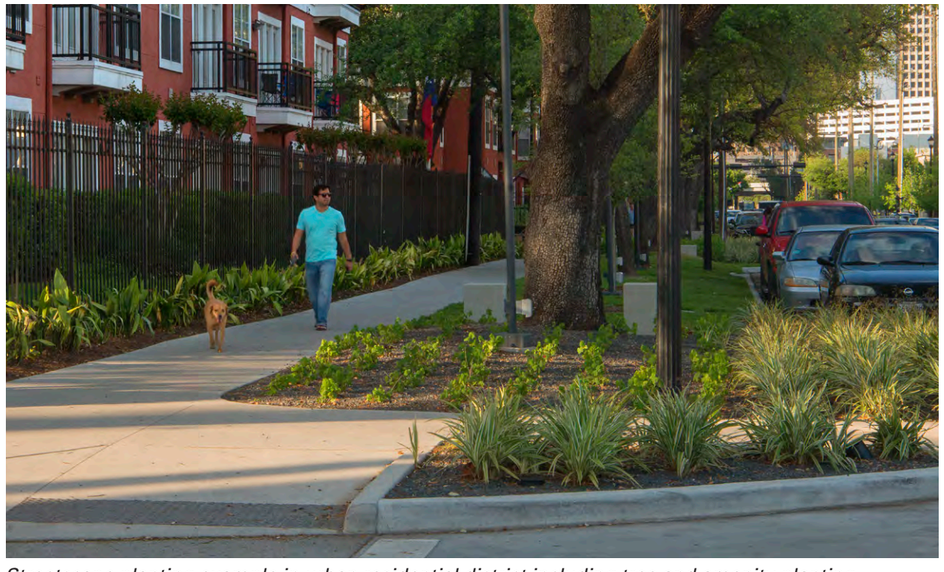
NATURALIZED PRAIRIE

Native and naturalized grasses and wildflowers serve as the main buffer between I-70 East and surrounding commercial and industrial land uses in Segment 2.

- Native seeding plans must include both warm and cool season grasses; both bunch and sod forming grasses, native wildflowers, shrubs, and a nurse crop.
- The Federal Highway Administration, Department of Transportation 23 CFR 752.11 (b). Right-of-Way and Environment – Landscape and Roadside Development require that wildflower seed, seedlings or both, shall be provided on all federal-aid projects. Incorporate the Federal Highway Administration (FHWA) Operation Wildflower Program in planting efforts.



Streetscape planting example of enhanced landscape in amenity zone



Streetscape planting example in urban residential district including tree and amenity planting

2.12. LANDSCAPE PLANTING

A landscape planting program will be included with every project in the corridor. The program is to be completed in partnership with agencies and communities. Landscape planting programs should include plans for landscape planting, maintenance, and funding. The I-70 East corridor is susceptible to strong winds as well as chemicals used on the roadway and adjacent lands. Soils are often poor because of the roadway construction activity. Native plant materials are suited to the local environment and their use is required by CDOT on highway corridors.

- Avoid straight lines of trees or rectangular masses. Design for natural or informal placement of plants.
- Graduate the heights of plant material as the design moves away from the roadway.
- Avoid equal or monotonous spacing of plant material. Vary the number of plants in adjoining groups. Vary the distances between accent plants.
- Group plants according to their water needs (“hydrozoning”).
- Use plant material that can survive with little to no maintenance. Plants that are known to have pest or disease problems should not be used.
- When planting on slopes, place lower-water demand plants at the tops of slopes and higher-demand plants at the bottom.
- Do not completely encircle lights, signs or other roadway structures with vegetation to ensure these elements are accessible to Maintenance.

2.13. IRRIGATION

- Utilize a central control for irrigation systems and consider the use of reclaimed water, including fully treated effluent and water harvesting techniques, as a supplement to irrigation.
- Provide temporary watering for containerized native plants for a period of approximately two to three years.

CHAPTER 3
DESIGN SEGMENT 3

Segment 3 includes I-70 East from its intersection with Colorado Boulevard to Quebec Street. This segment returns from below-grade at Colorado Boulevard to slightly above grade of the adjacent developments. The guidelines and recommendations included in this chapter provide aesthetic guidance for the edges, support structures, medians, frontage roads and landscape treatment for future improvements along this segment of the highway. These recommendations will support the vision of a unified corridor and integrate future improvements with the north-south and east-west themes of I-70 East identified in the introductory chapters.

3-1. THEME

EAST-WEST EXPERIENCE

THE RIVERBANKS

Segment 3 represents the riparian landscapes and habitats of Colorado's Front Range. The flowing rivers, slowing rising riverbanks, and native grasses that compose this landscape are reflected in the character of Segment 3's subtle edge conditions such as fencing and guardrails.

Textures and patterns should be memorable, repeatable, and support the Riparian theme of this segment.

COLOR SELECTION AND APPLICATION

This segment's color palette should be representative of signature colors of the riverbank landscape. Base colors remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include fence posts and overpass structures. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

ACCENT COLORS

FS14052

FS14052

FS14052

NORTH-SOUTH EXPERIENCE

Photo Credit: Jennifer Wahlers, Historian

BUSINESS + INDUSTRY

Segment 3 represents a commercial workforce community along the corridor. With an emphasis on industrial practices and local business, highway overpass structures become opportunities for art integration and edge features create moments of community reflection.

COLOR SELECTION AND APPLICATION

The north-south color palette should draw inspiration from local structures and collaborative community input. Base Colors for north-south infrastructure remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include overpass gateway features. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

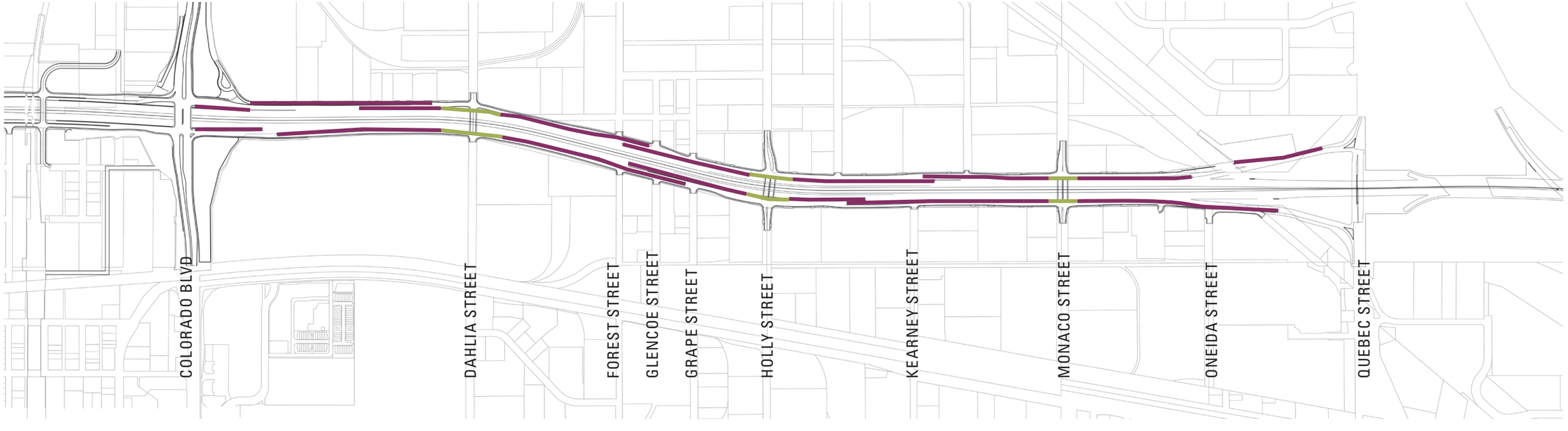
ACCENT COLORS

FS14052

FS14052

FS14052

Figure 18: Segment 3 Future Edge Conditions



MAP KEY

EDGE TYPE 3-A

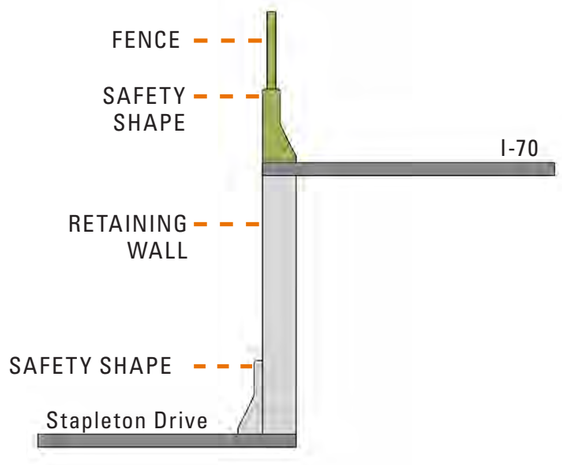
EDGE TYPE 3-B

Segment 3 of I-70 East sits slightly elevated from the adjacent landscapes laying to the north and south of the highway. Local streets Dahlia, Holly, and Monaco run under the highway, providing opportunities for creative interpretation and art integration into overpass structures.

There are two main edge conditions along Segment 3. The first type (Type 3-A) is located along each of the overpass conditions of the highway. The second and most common condition (Type 3-B), allow for an option of either a safety shape or guard rail barrier.

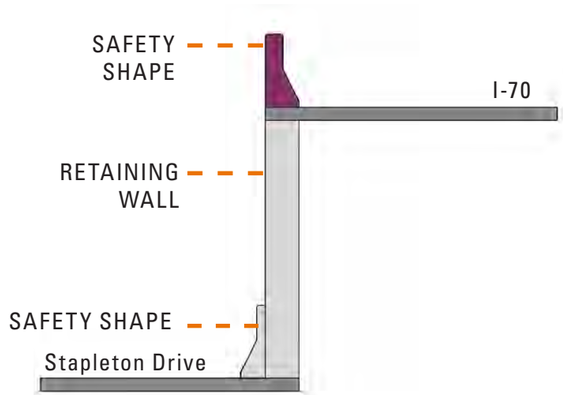
EDGE TYPE 3-A

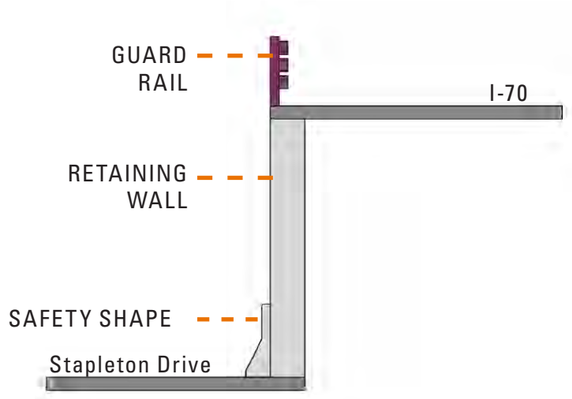
The elements of Edge Type 3-A protect travellers along local streets and on underpasses from potential highway debris and keep highway travellers within the boundaries of the road.



EDGE TYPE 3-B

In Segment 3, Edge type 3-B is the most common edge type. This edge protects highway travellers along elevated portions of the roadway. Edge type 3-B allows for the option of either a safety shape or a guard rail. The selected edge type must be coordinated for consistency throughout this segment of the corridor.

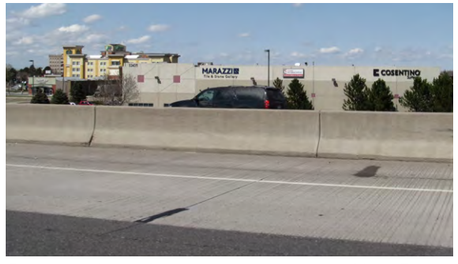




EDGE TYPE 3-B

In Segment 3, Edge type 3-B is the most common edge type. This edge protects highway travellers along elevated portions of the roadway. Edge type 3-B allows for the option of either a safety shape or a guard rail. The selected edge type must be coordinated for consistency throughout this segment of the corridor.

Safety shape at the base of a wall along I-25.



Free-standing safety shape along edge of I-70 East

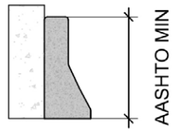
WHAT IS A SAFETY SHAPE?

Safety Shape barriers are designed to mitigate the energy of crash impacts. These barriers begin with a 3-inch vertical face at the pavement level, then break to a sloped face, changing to a nearly vertical face at the top of the barrier. The overall height is at least 34 inches above the pavement. When a vehicle impacts a safety shape barrier, a significant portion of its energy is absorbed in the climbing or lifting action that occurs when the tires roll up the lower sloping face.

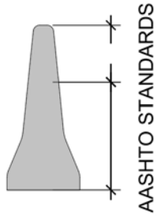
For more information about safety shapes, visit:

http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/concrete_barriers/

1.1 SAFETY SHAPE



Safety shape adjacent to noise wall.



Free standing safety shape.

EDGE RECOMMENDATIONS

3.1 SAFETY SHAPE

- Safety shapes should be designed to meet AASHTO standards.
- Color safety shapes using the recommended color palette in order to maintain consistency throughout the corridor. See Section 3-1 Theme to reference color palette.
- Utilize continuous safety shapes rather than segmented movable barriers.
- Provide edge delineation through applied markings and reflectors rather than painting bright contrasting colors on the concrete.

3.3 GUARD RAIL

- Guard rails should be designed to meet AASHTO standards
- Utilize box beam guard rails. Eliminate the use of galvanized “W” rails
- Guard rails should be integrated into the design of retaining walls below or adjacent safety fencing through the appropriate use of color and/or finish
- Guard rail posts should not extend above the top beam.

3.4 SAFETY FENCING

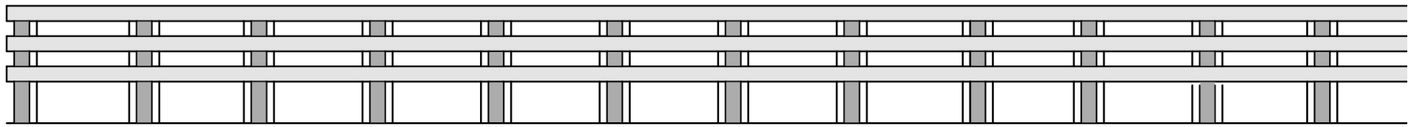
- The overall height of the combination of barrier safety shape and safety fencing should meet or exceed AASHTO standards
- Safety fencing should be structurally affixed atop retaining walls where fencing is necessary per AASHTO standards
- Fencing design should incorporate an interpretation of the riparian theme of the segment that is experienced in a peripheral manner
- Fencing design should be experienced in a linear, horizontal manner; to that end, the horizontal length of fence panels should not be less than 2-times the maximum vertical height of safety fences within the corridor
- Safety fence panels should “read” in a horizontal manner while meeting AASHTO standards; the following may be considered appropriate material options:
  - Rectangular wire mesh fence panels (1” x 2”, 1” x 3”, 2” x 4”, etc.) oriented with the larger dimension on the horizontal plane
  - Steel or aluminum horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge
- Safety fence panels should be as transparent as possible; the following may be considered appropriate design criteria:
  - Use of small-gauge wire mesh fence panels in galvanized or other non-corrosive finishes (vinyl or powder coat finishes are not recommended for wire mesh panels)
  - Horizontal cabling with adequately-spaced vertical wire support members of no more than ½ the cable gauge
- Fence posts should be made of steel or aluminum material with a galvanized or otherwise non-corrosive finish
- Fence posts should not extend above the top of adjacent fence panels

3-3 MEDIANS

MEDIAN RECOMMENDATIONS

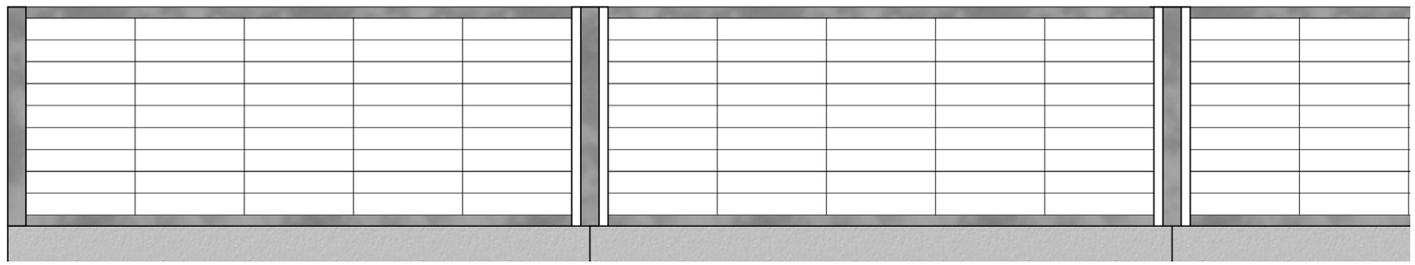
- The presence and placement of median barriers should meet AASHTO guidelines (Roadside Design Guide, Chapter 6)
- Median barriers should incorporate both a safety shape and “glare screen” to protect vehicles travelling in opposite directions
- Glare screens should be designed so as not to appear monolithic with safety barriers below
- The use of vertical or horizontal fenestration is encouraged to provide visual interest

GUARD RAIL EXAMPLE



Guard rail posts should not extend above the top beam.

SAFETY FENCE EXAMPLE



Safety fence panels should be as transparent as possible.

SAFETY SHAPE WITH GLARE SCREEN

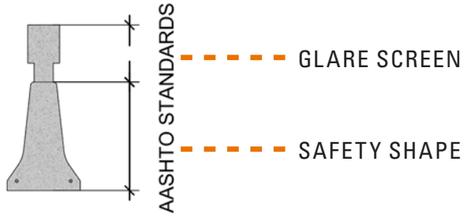
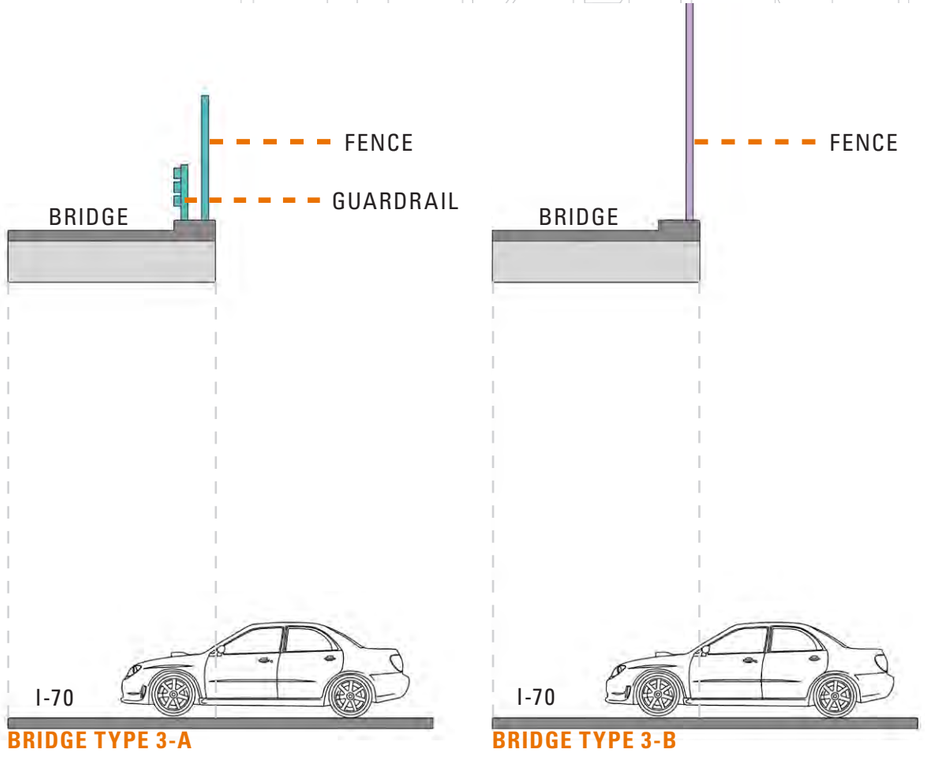


Figure 19: Segment 3 Future Bridge Conditions

MAP KEY

BRIDGE TYPE 3-A

BRIDGE TYPE 3-B



Segment 3 support structures consist mainly of bridges that support the highway as overpass to local roads. A hierarchy of overpass design should be incorporated to reflect the difference in street classification of north-south streets, allowing for higher-volume and higher-speed streets to comfortably accommodate both vehicular and pedestrian traffic and for local streets to elevate the quality of the pedestrian environment.

Road bridges are classified into two standard types: Type 3-A, which apply to all local road bridges in the Segment, and Type 3-B which will accommodate the rail tracks between Oneida and Quebec Streets.

SUPPORT STRUCTURE RECOMMENDATIONS

Segment 3 contains a number of local street underpasses. Should reconstruction of this segment take place, developers should collaborate with CDOT to meet the following recommendations.

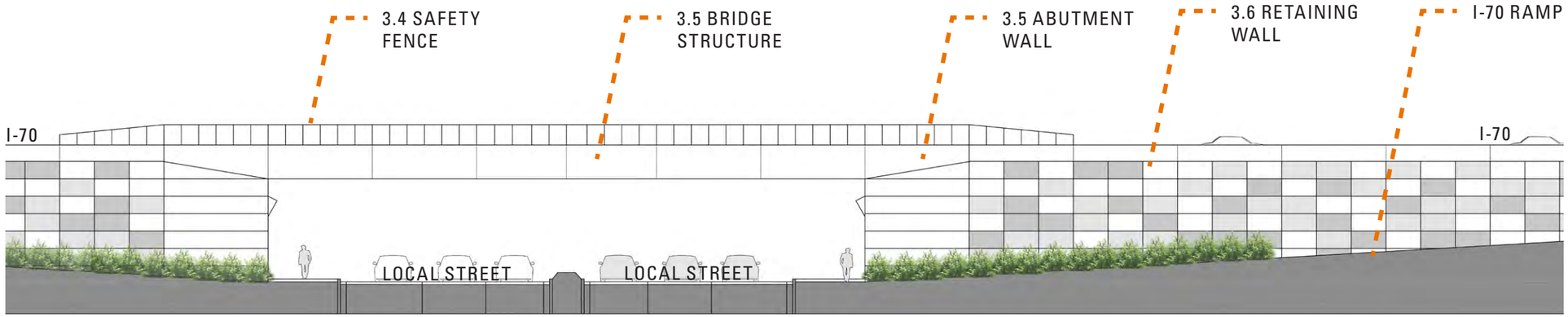
3.5 BRIDGES AND ABUTMENTS

- Bridges should incorporate low profile structural design features that appear to span across and beyond abutment walls below through the extension of safety fencing and barrier wall.
- Bridge structural elevations should incorporate horizontal fenestration that provides simple shadow effect.
- Bridge abutment walls should be predominantly vertical.
- Bridge abutment wall design applications should extend horizontally beyond the face of the underpass opening; this extension should be equal to or greater than the height of the abutment wall.
- The treatment of abutment walls (both below the bridge structure and beyond the face of the underpass opening) should be distinctively different than that of adjacent retaining walls; this may include vertical or horizontal fenestration, changes in color or texture, interpretive artwork, or other elements that enhance the experience of approaching and driving under bridge structures.
- Abutment wall design should incorporate local aesthetics and draw inspiration from neighborhood character
-

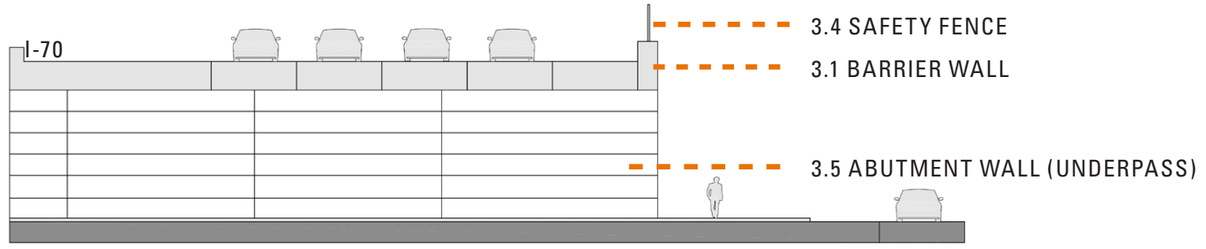
3.6 RETAINING WALLS

- Retaining walls in Segment 3 should incorporate an artistic interpretation of the north-south theme of the segment, expressing the adjacent land uses, history or culture of the area.
- Retaining wall design should incorporate a variation in fenestration, color, texture, materials, etc. so as to not appear monolithic.
- In general, retaining walls should be predominantly vertical. Where space is available between the face of retaining wall and the back of adjacent curb.
- The use of sloped paving areas as transition from retaining walls should be avoided as possible.

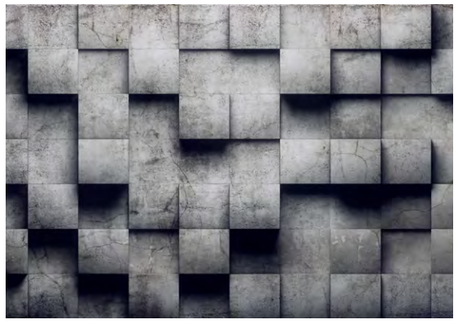
IMPLEMENTATION EXAMPLE



This example uses modular concrete panels with depressions and extractions that will allow for a play of light and shadow



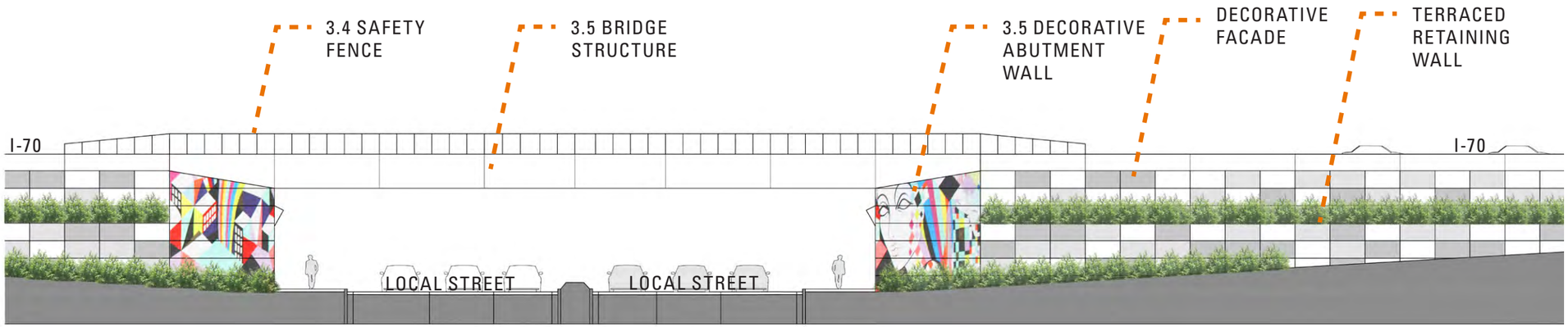
REFERENCE IMAGERY



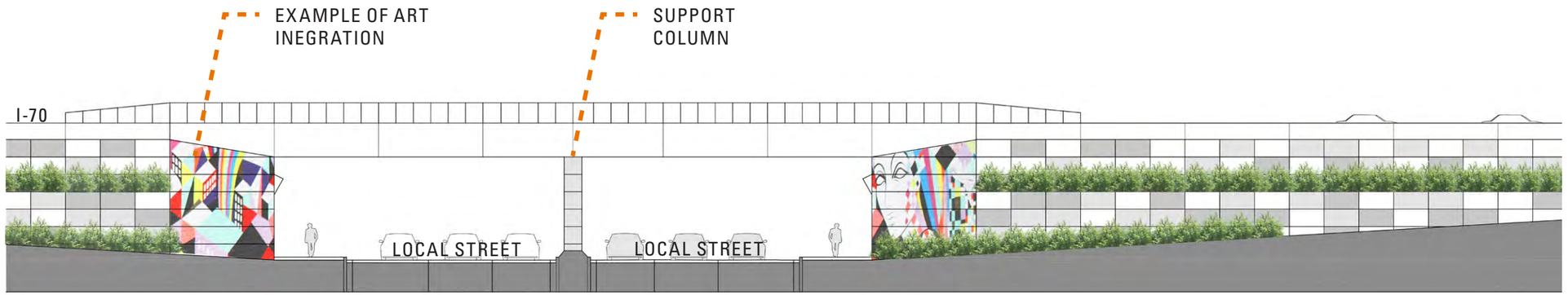
Although these guidelines do not dictate the material for abutment walls, different applications of extrusion and depression of concrete elements could help create interesting aesthetics.

Segment three provides interesting resources from local buildings, and landscapes to use for inspiration.

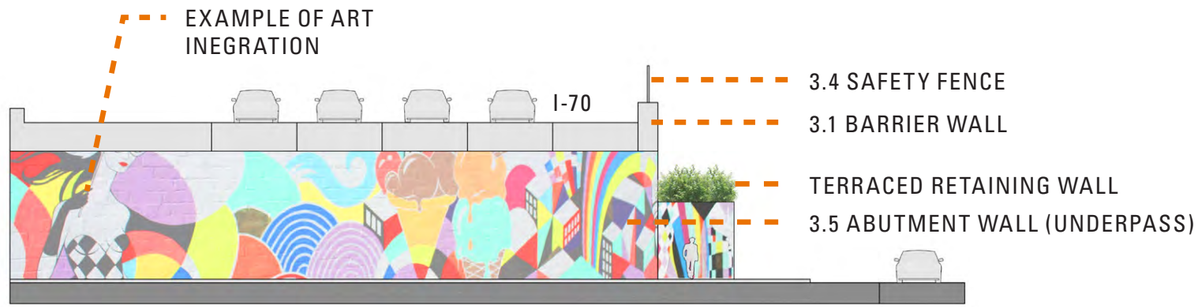
IMPLEMENTATION EXAMPLE



Integrating art into the bridge and underpass structures is a way to reflect the surrounding community in the built environment



Quebec Street in Segment 3 will include center columns



Incorporating art into underpass structures provide interest for drivers and pedestrians and can serve as community way-findng devices

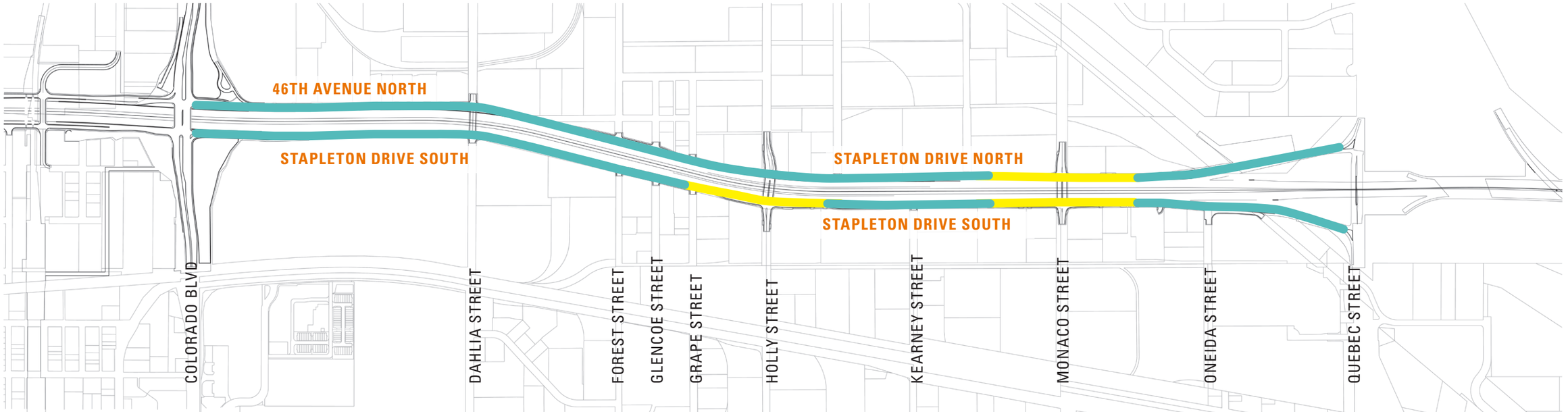
3.7 PEDESTRIAN ENVIRONMENT

Underpasses should accommodate the following pedestrian amenities:

- Sidewalk widths should be a minimum of 8’-0” in width on each side of the street
- Pedestrian lighting should be incorporated into local underpasses. Lighting poles and fixtures should be the same or complimentary to local streetscape fixtures and aesthetics and meet dark sky compliancy.

3-5. FRONTAGE ROAD

Figure 20: Segment 3 Future Frontage Road Conditions



Frontage roads in Segment 3 service primarily commercial and industrial properties.

There will be two types of frontage road conditions along Stapleton Drive in Segment 3. The first (Type 3-A), provides accommodations for pedestrians and allows for a decorative buffer between the frontage road and highway edge. The second type (Type 3-B) allows for a wider buffer and more expansive planting between highway edge and pedestrian realm.

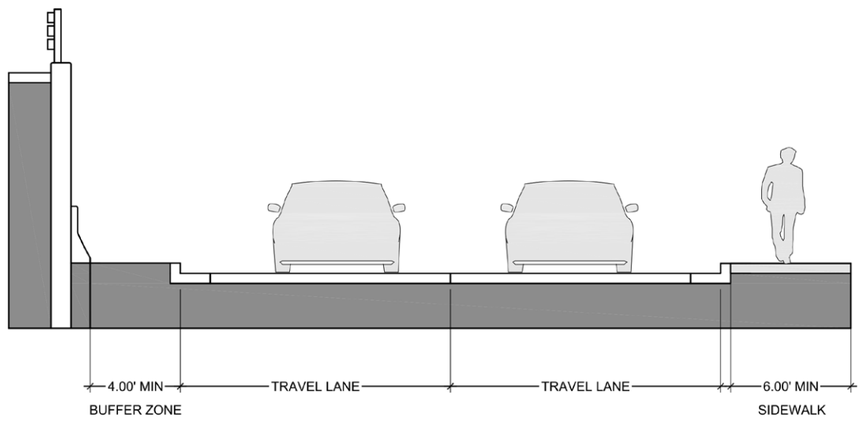
MAP KEY

TYPE 3-A

TYPE 3-B

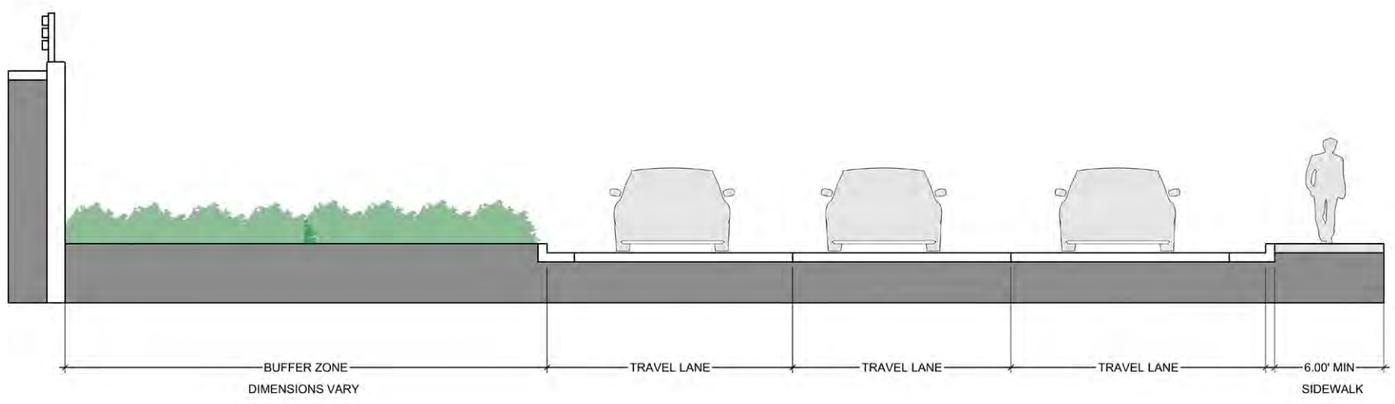
RECOMMENDED SECTION - TYPE 3A

ATTACHED SIDEWALK WITH SAFETY SHAPE AND RETAINING WALL



RECOMMENDED SECTION - TYPE 3B

EXPANDED BUFFER ZONE WITH PLANTING



FRONTAGE ROAD RECOMMENDATIONS

3.9 STREETSCAPE

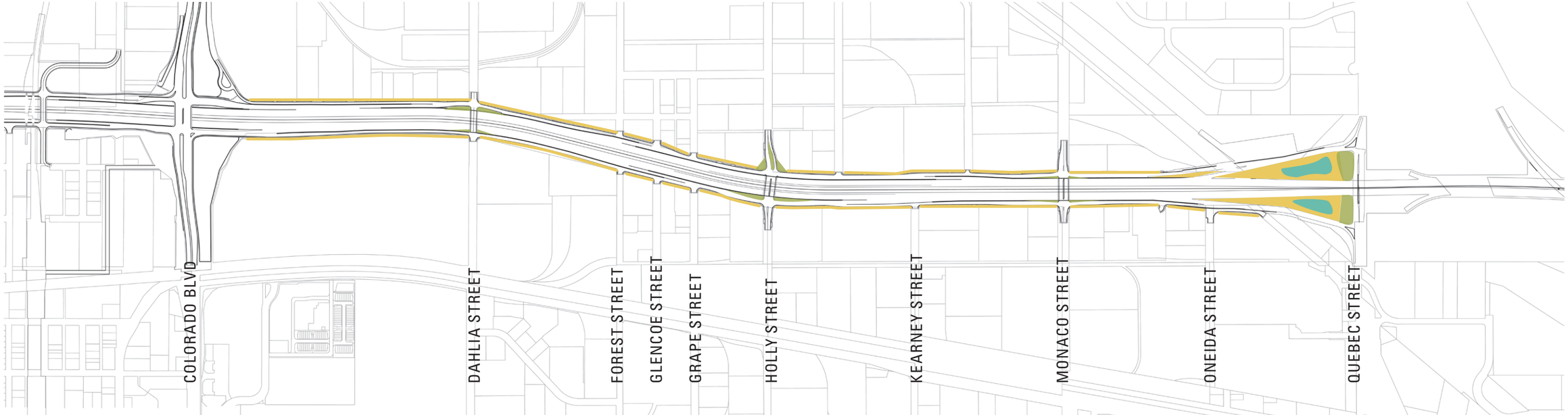
- Create an inviting pedestrian environment by including the following amenities
  - Seating whose aesthetic characteristics are integrated with neighborhood character and receive community approval
  - Pedestrian lighting whose aesthetic characteristics are integrated with neighborhood character and receive community approval.
  - Decorative buffer
- Frontage road streetscapes should meet standards as described in City and County of Denver Streetscape Design Manual (1993):

http://www.denvergov.org/Portals/646/documents/Zoning/other_regulations/DesignGuidelines_StreetscapeDesign_1993.pdf

- Expanded landscape areas with sloped embankments or landform work should refer to the CDOT Landscape Architecture manual:

https://www.codot.gov/programs/environmental/landscape-architecture/cdot-landscape-architecture-manual-8-18-14/view

Figure 21: Segement 3 Future Planting Conditions



KEY

DETENTION PLANTING

ENHANCED LANDSCAPE

NATURALIZED PRAIRIE

DETENTION PLANTING

- Recommendations on appropriate trees, shrubs, and seed mixes can be found in the UDFCD Drainage Criteria Manual http://www.udfcd.org/downloads/down_critmanual_volIII.htm
- Use grasses on side slopes of less than 3:1 for ease of maintenance and detention functionality
- Steep slopes greater than 3:1 should be planted with shrubs and/or groundcovers that do not require mowing. Select plant species that produce dense, fibrous roots to help prevent soil erosion.
- Trees are not recommended on steep side slopes.
- Planting should be designed with attractive natural-looking features.
- Select plants which do well with little or no maintenance.

ENHANCED LANDSCAPE

Enhanced landscapes should create the gateway experiences for drivers and pedestrians crossing above or below I-70 East

- Enhanced planting areas should include the following minimums in planting distribution:
  - For every 100sf of area, 5sf should be shrub planting
  - For every 100sf of area, 25sf should be native ornamental planting
  - For every 100sf of area, 70sf should be native grasses and/or wildflowers
  - 1 tree should be planted for every 1,000sf of area
  - 1/3 of all tree species should be evergreen

NATURALIZED PRAIRIE

Native and naturalized grasses and wildflowers serve as the main buffer between I-70 East and surrounding commercial and industrial land uses in Segment 3.

- Native seeding plans must include both warm and cool season grasses; both bunch and sod forming grasses, native wildflowers, shrubs, and a nurse crop.
- The Federal Highway Administration, Department of Transportation 23 CFR 752.11 (b). Right-of-Way and Environment – Landscape and Roadside Development require that wildflower seed, seedlings or both, shall be provided on all federal-aid projects. Incorporate the Federal Highway Administration (FHWA) Operation Wildflower Program in planting efforts.

Terraced planting example at Brighton Blvd

Detention planting example along I-25

3.10. LANDSCAPE PLANTING

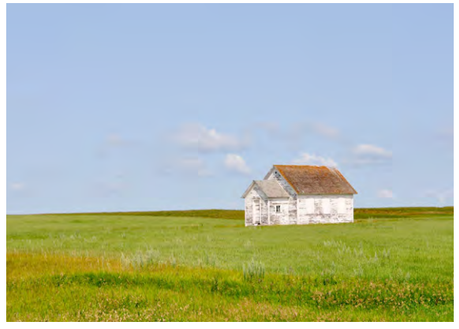
A landscape planting program will be included with every project in the corridor. The program is to be completed in partnership with agencies and communities. Landscape planting programs should include plans for landscape planting, maintenance, and funding. I-70 East is susceptible to strong winds as well as chemicals used on the roadway and adjacent lands. Soils are often poor because of the roadway construction activity. Native plant materials are suited to the local environment and their use is required by CDOT on highway corridors.

- Create a continuous visual and habitat pattern by extending planting across the full extent of medians and roadway edges.
- Avoid straight lines of trees or rectangular masses. Design for natural or informal placement of plants.
- Graduate the heights of plant material as the design moves away from the roadway.
- Avoid equal or monotonous spacing of plant material. Vary the number of plants in adjoining groups. Vary the distances between accent plants.
- Group plants according to their water needs (“hydrozoning”).
- Use plant material that can survive with little to no maintenance. Plants that are known to have pest or disease problems should not be used.
- When planting on slopes, place lower-water demand plants at the tops of slopes and higher-demand plants at the bottom.
- Do not completely encircle lights, signs or other roadway structures with vegetation to ensure these elements are accessible to Maintenance.

3.11. IRRIGATION

- Utilize a central control for irrigation systems and consider the use of reclaimed water, including fully treated effluent and water harvesting techniques, as a supplement to irrigation.
- Provide temporary watering for containerized native plants for a period of approximately two to three years.

CHAPTER 4
DESIGN SEGMENT 4



Segment 4 includes I-70 East from its intersection with Quebec Street west to Tower Road. The recommendations outlined in this chapter provide aesthetic guidance for the edges, medians, and landscape treatment should future reconstruction of this segment take place. These recommendations will support the vision of a unified corridor and integrate any future improvements with the north-south and east-west themes of I-70 East identified in the previous chapter.

4-1 THEME

EAST-WEST EXPERIENCE

THE GREAT PLAINS

Segment 4 represents the sweeping landscapes and big sky of the eastern plains. The rolling grasses, roaming species and agricultural history of this segment are reflected in the subtle character of Segment 4's edges and few support structures.

COLOR SELECTION AND APPLICATION

This segment's color palette should be representative of signature colors of the plains landscape. Base colors remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include gateway features. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

ACCENT COLORS

FS14052

FS14052

FS14052

NORTH-SOUTH EXPERIENCE

NEW NEIGHBORHOODS

Segment 4 represents new and growing communities on the eastern end of the corridor. The suburban aesthetic of colorful single family homes, community parks and schools, and playful shopping districts with new urbanist style are the signature of this segment. .

COLOR SELECTION AND APPLICATION

The north-south color palette should draw inspiration from local neighborhood centers, school communities and collaborative community input. Base Colors for north-south infrastructure remain consistent throughout the entire corridor. Accent colors should be utilized to highlight smaller details of structural elements that are attached to the overall roadway structure. Examples of accent color application in this segment include gateway features. To the right is a suggested palette. All colors should be tested on site to accurately judge accuracy of desired effect. Defined color palette should be coordinated with developer, the City, CDOT and receive community approval.

SAMPLE COLOR PALETTE

BASE COLORS

FS14052

FS14052

ACCENT COLORS

FS14052

FS14052

FS14052

Figure 22: Segment 4 Future Edge Conditions

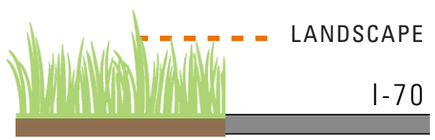
MAP KEY

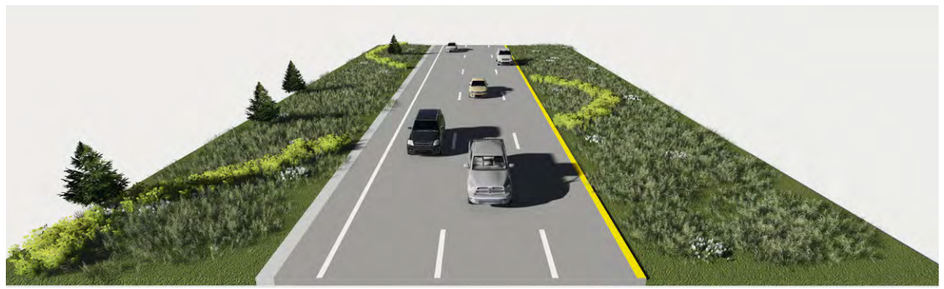
- EDGE TYPE 4-A
- EDGE TYPE 4-B
- EDGE TYPE 4-C

Segment 4 of I-70 East sits slightly above, slightly below, or at-grade with the adjacent landscapes laying to the north and south of the highway. There are three main edge conditions along Segment 4. The first type is at grade with existing landscape and requires no barrier. Type 4-B includes a guardrail and landscaped edge. Type 4-C includes a safety shape which helps retain adjacent landscaping.

EDGE TYPE 4-A

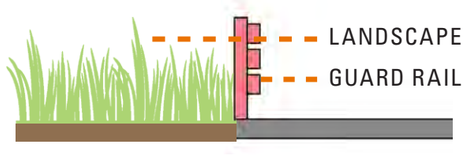
Edge Type 4-A consists of planting along the highway. Refer to section for 4-4 for landscape recommendations.





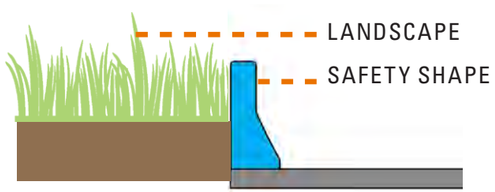
EDGE TYPE 4-B

Edge Type 4-B consists of landscape and includes a guardrail.



EDGE TYPE 4-C

Edge Type provides a safety shape for roadway protection and also includes landscape.



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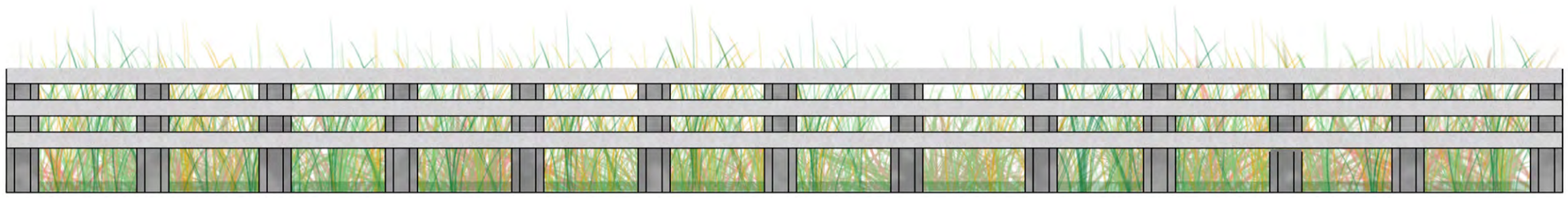
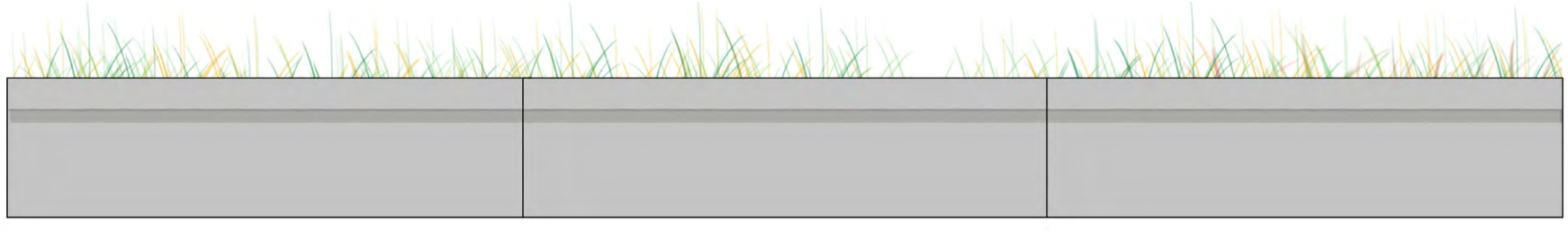
EDGE TYPE 4-A LANDSCAPE

EDGE TYPE 4-B GUARD RAIL



EDGE TYPE 4-C SAFETY SHAPE



EDGE RECOMMENDATIONS

Segment 4 edge conditions include significant amount of landscape. Refer to section 4-4 Landscape Treatment for landscape recommendations. Improvements to edge conditions along Segment 4 should include coordination between developer, CDOT and local municipality.

4.1 GUARD RAIL

- Guard rails should be designed to meet AASHTO standards
- Utilize box beam guard rails. Eliminate the use of galvanized "W" rails
- Guard rails should be integrated into the design of retaining walls below or adjacent safety fencing through the appropriate use of color and/or finish
- Guard rail posts should not extend above the top beam.

4.2 SAFETY SHAPE

- Safety shapes should be designed to meet AASHTO standards.
- Color safety shapes using the recommended color palette in order to maintain consistency throughout the corridor. See Section 1-1 Theme to reference color palette.
- Utilize continuous safety shapes rather than segmented movable barriers.
- Provide edge delineation through applied markings and reflectors rather than painting bright contrasting colors on the concrete.

4-3 MEDIANS

MEDIAN RECOMMENDATIONS

Segment 4 is the only segment with two different median types. The first type is a safety shape with glare screen. This should be the same as or complimentary to all other median safety shape/glare screen structures throughout the corridor. The other median type occurs between Chambers and Tower Roads and is a landscaped median. Refer to Section 4-4 for landscape guidelines.

- The presence and placement of median barriers should meet AASHTO guidelines (Roadside Design Guide, Chapter 6)
- Median barriers should incorporate both a safety shape and “glare screen” to protect vehicles travelling in opposite directions
- Glare screens should be designed so as not to appear monolithic with safety barriers below
- The use of vertical or horizontal fenestration is encouraged to provide visual interest
- East of Chambers Road, medians will include landscape planting. Refer to section 4-4 for more information.

SAFETY SHAPE WITH GLARE SCREEN

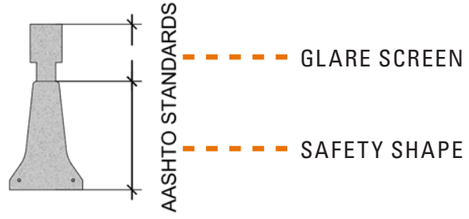
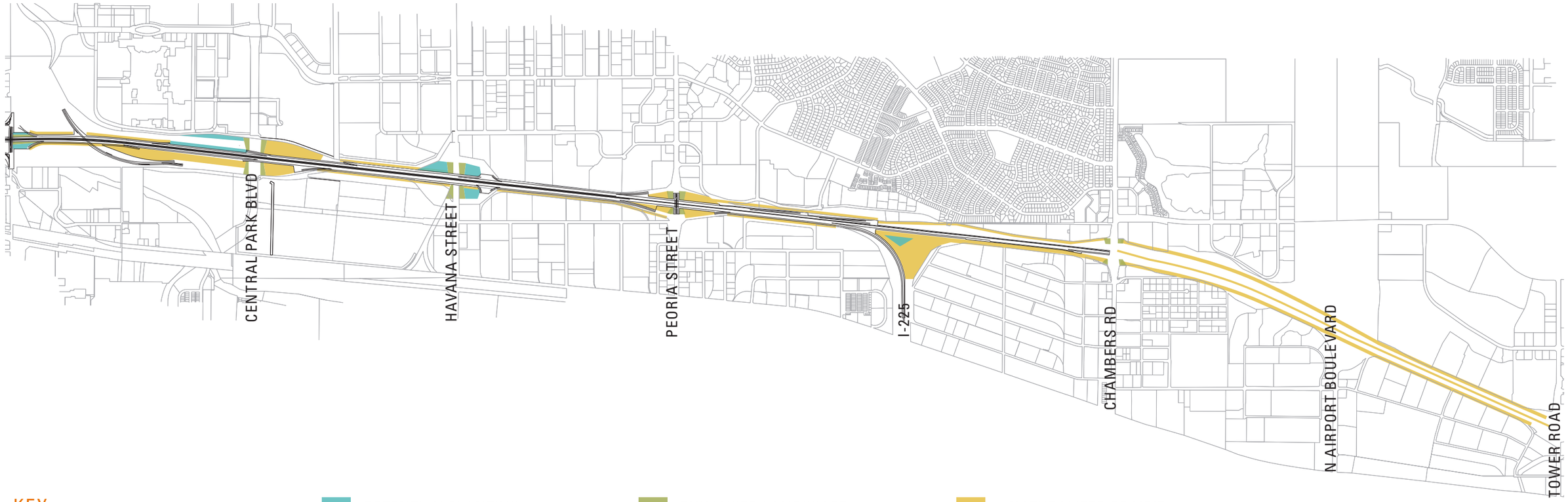


Figure 23: Segment 4 Future Planting Conditions



KEY

- DETENTION PLANTING
- ENHANCED LANDSCAPE
- NATURALIZED PRAIRIE

DETENTION PLANTING

- Recommendations on appropriate trees, shrubs, and seed mixes can be found in the UDFCD Drainage Criteria Manual http://www.udfcd.org/downloads/down_critmanual_volIII.htm
- Use grasses on side slopes of less than 3:1 for ease of maintenance and detention functionality
- Steep slopes greater than 3:1 should be planted with shrubs and/or groundcovers that do not require mowing. Select plant species that produce dense, fibrous roots to help prevent soil erosion.
- Trees are not recommended on steep side slopes.
- Planting should be designed with attractive natural-looking features.
- Select plants which do well with little or no maintenance.

ENHANCED LANDSCAPE

- Planting should enhance the gateway experience of drivers and pedestrians crossing above or below I-70
- Enhanced planting areas should include the following minimums in planting distribution:
  - For every 100sf of area, 5sf should be shrub planting
  - For every 100sf of area, 25sf should be native ornamental planting
  - For every 100sf of area, 70sf should be native grasses and/or wildflowers
  - 1 tree should be planted for every 1,000sf of area
  - 1/3 of all tree species should be evergreen

NATURALIZED PRAIRIE

Native or naturalized grasses and wildflowers provide the main visual experience travelling east-west through Segment 4.

- Native seeding plans must include both warm and cool season grasses; both bunch and sod forming grasses, native wildflowers, shrubs, and a nurse crop.
- The Federal Highway Administration, Department of Transportation 23 CFR 752.11 (b). Right-of-Way and Environment – Landscape and Roadside Development require that wildflower seed, seedlings or both, shall be provided on all federal-aid projects. Incorporate the Federal Highway Administration (FHWA) Operation Wildflower Program in planting efforts.

4.3 RESTORING NATIVE OR DISTURBED VEGETATION

- Ensure that the selected plant palette complements the site-specific existing vegetation.
- Provide for a combination of understory and overstory plantings to improve long-term establishment.
- Restored plant communities should have variations in plant height, size and width.
- Utilize native Colorado Front Range plant communities; Refer to FHWA Environmental Review Kit for recommended roadside plant species: http://www.environment.fhwa.dot.gov/ecosystems/vegmgmt_rd_co.asp
- Develop a program to control noxious weeds and invasive plant species. In areas requiring vegetation, quickly establishing native species is the most effective method of controlling invasive weeds.
- Apply a prescribed soil treatment. Treatments such as plowing, disking, harrowing, furrowing, and hydroseeding ensure successful reestablishment, as does applying mulches. Soils should be roughened before planting to create favorable seed sites, particularly for grass and forb seed.
- Monitor revegetation during construction to ensure the specified materials and installation methods have been used. Monitor and maintain areas of revegetation and weed control for up to five years beyond warranty limits to ensure successful native plant establishment.

4.4. LANDSCAPE PLANTING

A landscape planting program will be included with every project in the corridor. The program is to be completed in partnership with agencies and communities. Landscape planting programs should include plans for landscape planting, maintenance, and funding. I-70 East is susceptible to strong winds as well as chemicals used on the roadway and adjacent lands. Soils are often poor because of the roadway construction activity. Native plant materials are suited to the local environment and their use is required by CDOT on highway corridors.

- Create a continuous visual and habitat pattern by extending planting across the full extent of medians and roadway edges.
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- When planting on slopes, place lower-water demand plants at the tops of slopes and higher-demand plants at the bottom.
- Do not completely encircle lights, signs or other roadway structures with vegetation to ensure these elements are accessible to Maintenance.

4.5. IRRIGATION

- Utilize a central control for irrigation systems and consider the use of reclaimed water, including fully treated effluent and water harvesting techniques, as a supplement to irrigation.
- Provide temporary watering for containerized native plants for a period of approximately two to three years.

Enhanced planting and terraced walls at a highway underpass

Native Colorado grasses and wildflowers set the tone of the Segment 4 landscape

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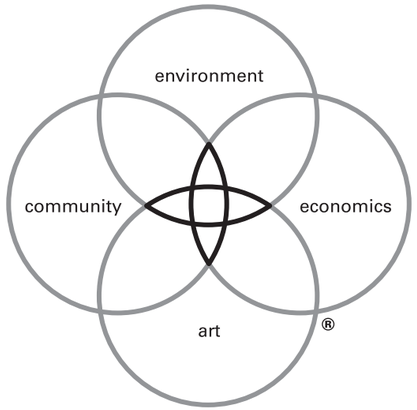

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