THE LAND GROUP

Highway 44 Pedestrian Crossing

Pre-Concept Report

Eagle, Idaho

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Acknowledgments

This project was completed in collaboration with the following working group, whose input was essential to the decisions and concepts generated for this document:

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Eagle River Development Partners

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Project Introduction 01

Project Summary

Purpose and Need

As the Treasure Valley's many natural and cultural amenities continue to attract residents to the area, critical infrastructure must be examined through the lens of projected development pressure to ensure users' continued health, safety, and enjoyment. The Community Planning Association of Southwest Idaho (COMPASS), an association of local governments tasked with planning for the valley's future, published *Communities in Motion 2040 2.0* (CIM 2040), the regional long-range transportation plan for Ada and Canyon Counties. The plan articulates several goals including: improving walkability, preserving agricultural land, minimizing vehicular congestion, improving municipalities' jobs-housing balance, enhancing park access, and preserving natural resources.

To accomplish these goals, one objective the plan identifies is high-capacity vehicular transportation along State Highway 44 to provide a crucial east-west transit connection, linking several of the state's largest economies and population centers. However, heavy vehicular travel along State Highway 44 poses challenges to a number of the goals outlined in CIM 2040 by creating a barrier to non-vehicular circulation, effectively separating businesses, schools, and residential areas north of Highway 44 from developments and neighborhoods to the south. Creating a bicycle and pedestrian-oriented connection on Highway 44 between Eagle Road and Palmetto Road offers many opportunities including: increased access to the Boise River for residents north of Highway 44, increased access to East State Street and downtown Eagle's commercial district for residents south of Highway 44, decreased vehicular traffic along State Highway 55 and Eagle Road, and improved pedestrian connection to key Greenbelt access points.

Goals

The goals for this project nest within the CIM 2040 vision by providing a safe pedestrian route perpendicular to State Highway 44, aiding in improvements toward a vibrant downtown core with increased workforce and customer connectivity, enhanced river and park access, and minimized environmental impact from informal trail access and greenbelt parking. Ultimately, the central purpose of this proposed crossing can be boiled down to improving pedestrian and bicyclist safety across Highway 44 while minimizing traffic disruptions along the route, thus improving access to natural and constructed amenities in the area.

Project Summary for the Transportation Improvement Program

The City of Eagle is considering opportunities for a grade-separated pedestrian and bicycle crossing within the area of State Highway 44 between Eagle Road and Palmetto Road. The project will permit pedestrian and bicycle traffic to cross the highway safely and quickly without slowing the highway's vehicular traffic flow, and is expected to improve business patronage and access to built and natural amenities.

Statement of Project Development

Project development at the level of detail within this report was necessary for a grade-separated crossing for several reasons. First, a careful inventory and analysis of site conditions allows the City of Eagle to act with accurate information. Next, producing initial recommendations for siting can help to more clearly define the project needs and limitations. Finally, high-level concept development allows for cost estimation that would not be otherwise possible.

Scope of Work

The Land Group was contracted to produce a pre-concept report for a grade-separated bicycle and pedestrian crossing for the State Highway 44 bypass between Eagle Road (Highway 55) and Palmetto Road. The intent of the project is to determine specific location, feasibility, and a preliminary cost estimation of an over- or undercrossing on the highway.

Assumptions

The Land Group assumes that a grade-separated pedestrian crossing is desired by the public at the proposed general location specified by the City of Eagle. While it is typically accepted that crossings which fully separate vehicles from pedestrians improve safety for all parties, additional research is included to support this claim at the specified location.

Cost

Based on cost precedent studies, a pedestrian overpass or underpass may cost $10,000 to $25,000 per linear foot of the crossing, respectively, with above-grade overpasses incurring higher costs for additional materials and a below-grade underpass requiring earthwork, lighting, utility relocation, and significant dewatering. Cost estimate case studies are included in figure 4.03.

1.01 Major Milestones

Project scheduling based on an assumed fall 2019 start date.

Fall 2019
Pre-Concept Report approved by city council
4-6 weeks

Spring 2020
Public involvement process
6 months

2021
Seek funding from grants and alternative sources
12-14 months

2022
Design process
12-24 months

2024
Begin construction
12-24 months

2027
Post-occupancy review and project closeout
12 months

Grant Narrative

Rapid growth throughout Boise, Eagle, and the surrounding Treasure Valley necessitate proactive infrastructure interventions from various municipal, state, and federal entities to maintain the safety, health, and sense of community that define the region. While Interstate 84 and State Highway 20/26 provide east-west connectivity between the capital city and growing communities to the west, including the city of Eagle, State Highway 44 remains the only major east-west transportation corridor north of the Boise River. This highway, which accommodated over 32,000 daily trips just east of the intersection of Eagle Road in 2015, will need to serve a projected 50,000 daily trips by 2040 (COMPASS). As a result, significant infrastructure investment is currently aiming to improve the highway's capacity and efficiency to meet this projected demand.

However, State Highway 44's improved east-west vehicular connectivity and the corridor's projected doubling of traffic volume pose significant constraints to north-south pedestrian and bicycle connectivity between the Boise River and downtown Eagle. Existing at-grade crossings at signalized intersections at S Edgewood Lane and S Eagle Road may carry increased risk and wait times. Additionally, these intersections are just over a mile apart, which far exceeds the maximum distance pedestrians are willing to walk to a signalized crossing. 75% of pedestrians will not even walk 550-1100 feet to a crossing if an unprotected mid-block crossing is perceived as feasible (National Association of City Transportation Officials). As a result, users may opt to avoid north-south crossing, which would impact Eagle's central business district, existing and proposed developments along the highway, and greenbelt interaction from users on both sides of the highway. Alternatively, users might opt for incredibly risky mid-block crossings, where 76% of pedestrian fatalities occur, or may drive instead, adding to parking demands and roadway congestion (NHTSA).

The improvement of State Highway 44 offers a great opportunity for strengthening the region's connection. However, it is crucial to consider Eagle's local character and historical use. Eagle is a town defined by its quaint, tree-lined streets and a serene, accessible river. Investment that strengthens the relationship between the town's natural and built amenities offers not only a way forward in the face of an uncertain future, but an acknowledgment of the cherished past.

Numerous examples from the United States, including precedent case studies such as Baseline Road Underpass in Boulder, CO; Lafayette Pedestrian Bridge in Portland, OR; the BP Pedestrian Bridge in Chicago, IL, and the Vancouver Land Bridge in Vancouver, WA confirm the efficacy of grade-separated crossings in improving pedestrian and vehicular safety while enhancing the economic and cultural vitality of the local community. The City of Eagle enjoys a unique and valuable opportunity to integrate such a crossing on presently vacant land in the Eagle River and Molinari developments.

Funding Opportunities

The following sources were identified as possibilities for future project funding, and it is recommended that they be explored by COMPASS and the City of Eagle.

Non-Profit Organization Funding

» Community Change Grant, America Walks
https://americawalks.org/community-change-grants/

Private Funding

» Community and Economic Development, SC Johnson
https://www.scjohnson.com/en/our-purpose/social-responsibility-news/community-and-economic-development/sc-johnson-grants-our-guidelines-and-focus-areas
» Made to Move, Blue Zone LLC and Degree
https://www.bluezones.com/made-to-move/

Federal Funding

» BUILD Discretionary Grants, DOT
https://www.transportation.gov/BUILDgrants
» Congestion Mitigation and Air Quality Improvement Program, FHWA
https://www.fhwa.dot.gov/environment/air_quality/cmaq/
» FAST Act, FHWA
https://www.fhwa.dot.gov/fastact/
» Grants and Cooperative Agreements, CDC
https://www.cdc.gov/grants/index.html
» Safe Routes to School, FHWA
https://www.fhwa.dot.gov/environment/safe_routes_to_school/overview/
» Smart Growth Implementation Assistance, EPA
https://www.epa.gov/smartgrowth/smart-growth-implementation-assistance
» TIFIA Credit Assistance, DOT
https://www.transportation.gov/buildamerica/programs-services/tifia

Local Funding

Partnerships with local developers may supplement a portion of the project cost, though this must be negotiated in the project planning stages.

Public Involvement Plan

The City of Eagle is exploring opportunities for an under- or overcrossing on State Highway 44 between South Eagle Road and Palmetto Street. Such a crossing would facilitate for Eagle residents' health, safety, and quality of life while bolstering economic growth at the planned developments on either side of Highway 44. A safer crossing will mitigate both the serious safety issues posed to pedestrians by the highway and the traffic disruptions that have grown along with Eagle's population.

A public involvement plan must appropriately gather the opinions, preferences, concerns, and local expertise of stakeholders and members of the public. Local jurisdictions and agencies will also be critical voices in the planning of a grade-separated crossing. A two-way collaborative process such as this will aid in the development of effective solutions that minimize drawbacks, maximize public benefits, and are defensible to all parties involved.

By utilizing time-tested techniques as well as newer, digital methods of communication, the public involvement plan will involve members of the community as effectively as possible.

Public Involvement Activities

1. **Identify stakeholders**
2. **Produce digital and physical outreach materials**
   - » Facebook, Twitter, and Instagram: Dedicated project pages will routinely feature update posts throughout the public involvement process
   - » Email contact: set up project contacts through email to regularly update invested members of the public
   - » Website content: the City of Eagle will develop website content to provide regular updates to interested parties
   - » Public involvement presentation: presentation materials such as slides or handouts will be created and presented to the public at meetings and outreach activities
3. **Conduct a statistically Valid Survey**
   A survey, requesting input on pedestrian crossing frequency, safety concerns, and perceptions of vehicular traffic will be sent to a predetermined and statistically valid group. Three thousand (3,000) households within the City of Eagle will be selected randomly from archived GIS data. These households will receive a postcard asking them to participate in a survey through an included website link. A minimum of 400 responses would be sufficient to generate a summary and provide a reasonable basis of public opinion. Offering incentives such as entering participants in a drawing for prizes is recommended to increase survey participation.
4. **User Group Input**
   User group input can be gathered through

stakeholder interviews and intercept surveys, which target the individuals who are most likely to use the proposed crossing. These interviews and surveys are intended to accumulate immediate information concerning user preferences and safety concerns.

Four information sessions held at different times will also be planned. To maximize efficiency and participation, individuals will be divided into work groups and interviewed with carefully selected questions.

Public Meetings and Update Presentations

Initial Public Input Meeting: the purpose of this meeting will be to introduce the public to the project and gather initial input on a potential grade-separated crossing.

Project Development Updates: During the planning and design stages of the project, two updates will be held. The first meeting's purpose will be to present concepts, gather public input on these concepts, and provide a status update on the current understanding of public opinion concerning the project. The second meeting will present results of the statistically valid survey, summarize public sentiment, and present the draft plan of the preferred concept.

Identified Project Stakeholders

- City of Eagle City Council members
- City of Eagle Parks, Pathways, and Recreation Commission
- City of Eagle Chamber of Commerce members
- Community Planning Association of Southwest Idaho (COMPASS)
- Ada County Highway District (ACHD)
- Idaho Transportation Department (ITD)
- Foundation for Ada/Canyon Trail Systems (FACTS)
- Eagle Arts Commission
- Eagle Urban Renewal
- Community Outdoor Sports Organizations
- Walk and Ride Eagle
- Eagle Police
- Eagle Fire District
- Local irrigation companies
- Local landowners
  - Eagle River development
  - Molinari Park development
- Local Media
- Eagle Schools
  - West Ada School District
  - Boise School District
- Additional stakeholders to be determined by the City of Eagle

02 Existing Conditions

Summary and Analysis of Existing Conditions

Road Conditions and Safety

State Highway 44, a four-lane, 55 mph urban highway, represents a significant barrier to bicycle and pedestrian movement within the City of Eagle. The highest rate of vehicle collisions and pedestrian-vehicle conflicts within or around the siting area occurs at the intersection of Eagle Road (also referred to as Highway 55) and Highway 44. The lower-traffic intersection of S Edgewood Way and Highway 44 exhibits the second highest number of collisions, and the continuation of this pattern with the intersection of Palmetto Street and Highway 44 can be reasonably expected. Therefore, a pedestrian crossing that conveniently draws pedestrians away from hazardous intersections could help improve both pedestrian and driver safety.

At present, the long distance (approximately one mile) between existing signalized pedestrian crossings on Highway 44 increases the likelihood of pedestrians crossing at unprotected mid-block locations. These crossings are extremely unsafe as drivers do not expect pedestrians, and there is a tragically high likelihood of fatality if a pedestrian is struck at the posted speed limit of 55 mph (see figure 2.05).

Topography

Existing topography within the siting area is practically nonexistent, meaning that an overpass or underpass must construct the entire required grade change rather than taking advantage of natural elevation changes.

Current Zoning

Parcels within the proposed siting area for this pedestrian crossing are currently zoned by the City of Eagle as C-3 Commercial, Central Business District, and Mixed-Use. These generally compatible uses will benefit from increased pedestrian connectivity, with no area expected to be adversely affected by a pedestrian crossing.

Planned Transportation Projects

A half continuous flow intersection (CFI) is planned for the intersection of highway 44 and Eagle Road, adjacent to Eagle's Central Business District. This intersection will increase wait times and detriment convenience for pedestrian crossings, making a grade-separated crossing potentially more attractive to users.

Planned Developments

Both sides of the highway are currently slated for development, with Molinari Park to the north and Eagle River to the south. A proposed crossing should avoid causing major disruption to planned structures and road layouts, and facilitate pedestrian connections using walkways through and around future developments. Such connections will provide a greater level of pedestrian movement between and within both developments.

Underground Utilities

A number of utilities exist along the State Highway 44 corridor, including water, sewer, irrigation, fiber optic cable, and storm drainage. While an overpass would require minimal rerouting of utilities regardless of location by increasing the proposed span to locate footings outside utility zones, an underpass would require avoidance or relocation of multiple underground utilities (see Utility Sections, figure 2.13). Avoidance would be achieved by increasing tunnel depth, while relocation of utilities would require burying those utilities deeper below the underpass. Both of these options increase construction costs.

In-depth explanations and graphics for these summaries are provided in the following pages for Existing Conditions.

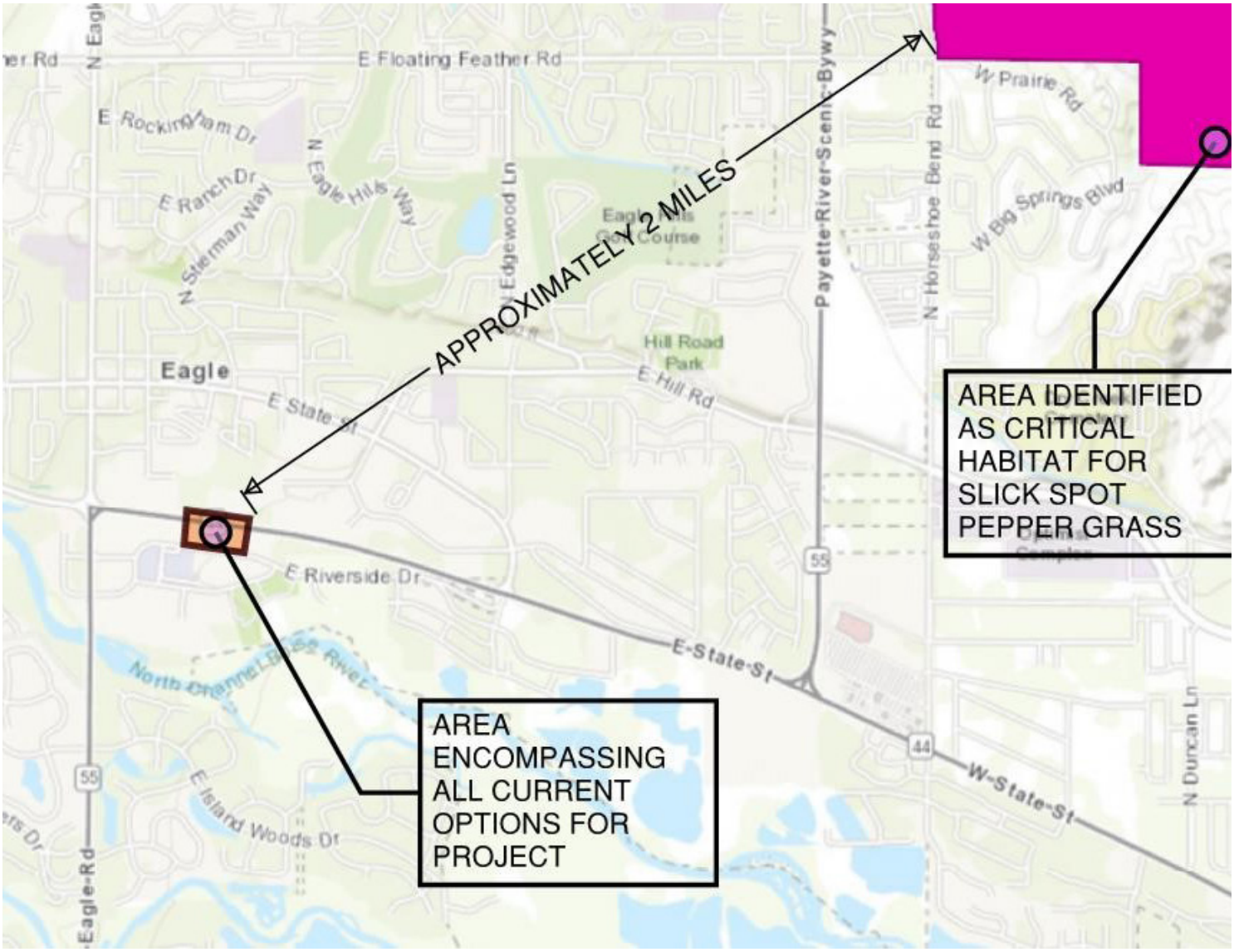
Environmental Scan

Summary

An environmental scan of the project area was conducted to identify the environmental factors affecting project concepts. The project should strive to minimize environmental impact and seek opportunities for environmental benefit such as stormwater treatment or improved wildlife habitat.

Wildlife

A high-level review of potential effects on wildlife was performed, including a review of endangered species critical habitats from USFWS. Results of that review show there are no critical habitats in the proposed disturbed area. See figure below for the location of the project to the nearest critical habitat.



2.01

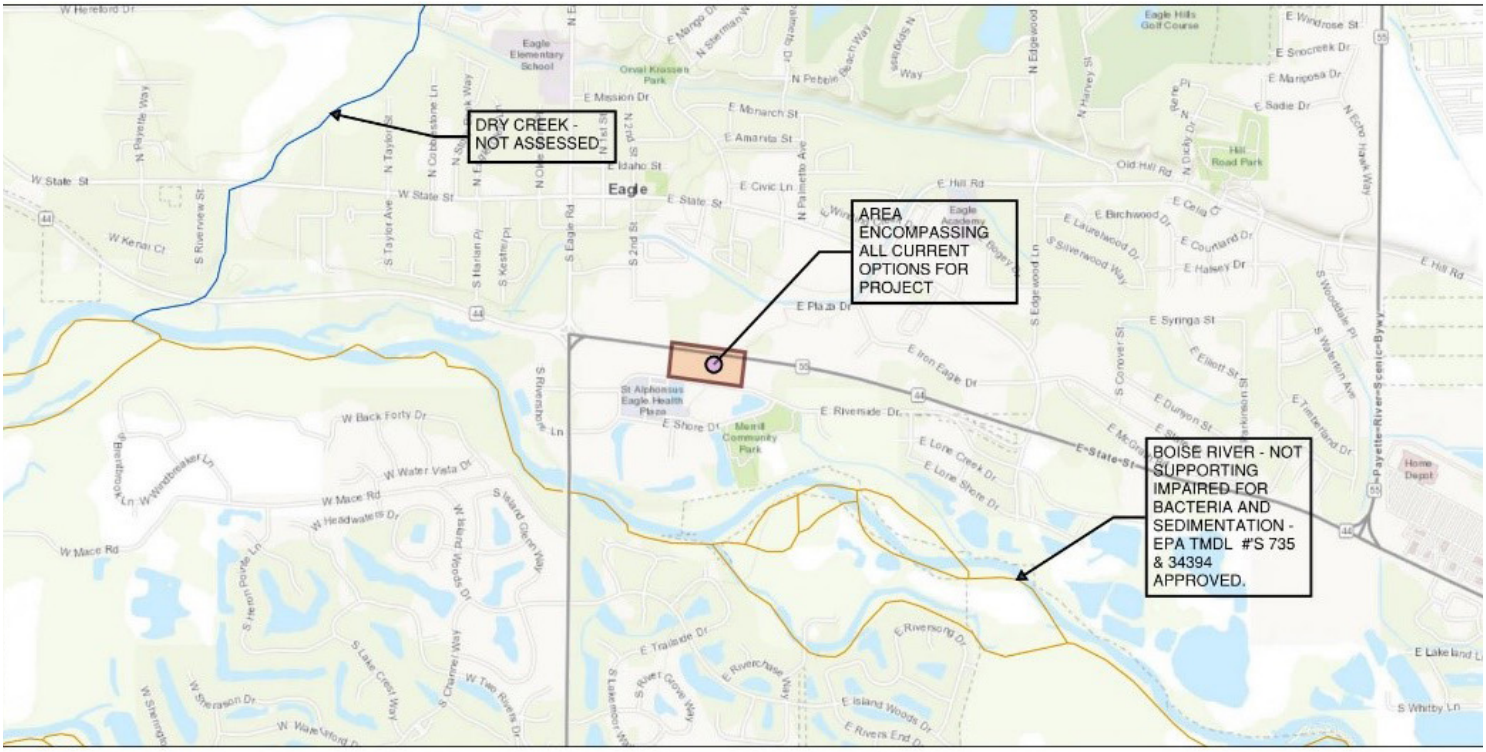
Waters of the United States

A review of Waters of the United States was performed to identify the waters of the US that are within one mile of the site, and assess any impact based on the water body status as assigned by the Idaho Department of Environmental Quality. Summarized results from IDEQ are shown below.

Stormwater (EPA-NDPES)

Once a preferred concept has been developed to a reasonable level of design, the size of the disturbed area must be determined to see if the project meets the requirements for coverage under the EPA's Construction General Permit (CGP).

Idaho 2014 Integrated Report (Final)



0 0.3 0.6 mi
0 0.5 1 km

March 19, 2019
2014 305(b) Streams (Final)
- Not Assessed (CAT 3)
- Not Supporting (CAT 4a, 4b, 4c, 5)

Sources: Esri, HERE, Garmin, Intermap, increment P Corp, GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap contributors, and the GIS User Community.

County of Ada, Bureau of Land Management, ESRI Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPAT, USDA | IDEQ, EPA-I Research Triangle Institute (RTI) | Idaho DEQ, F Triangle Institute (RTI), EPA-NHDPlus V2 | IDEC

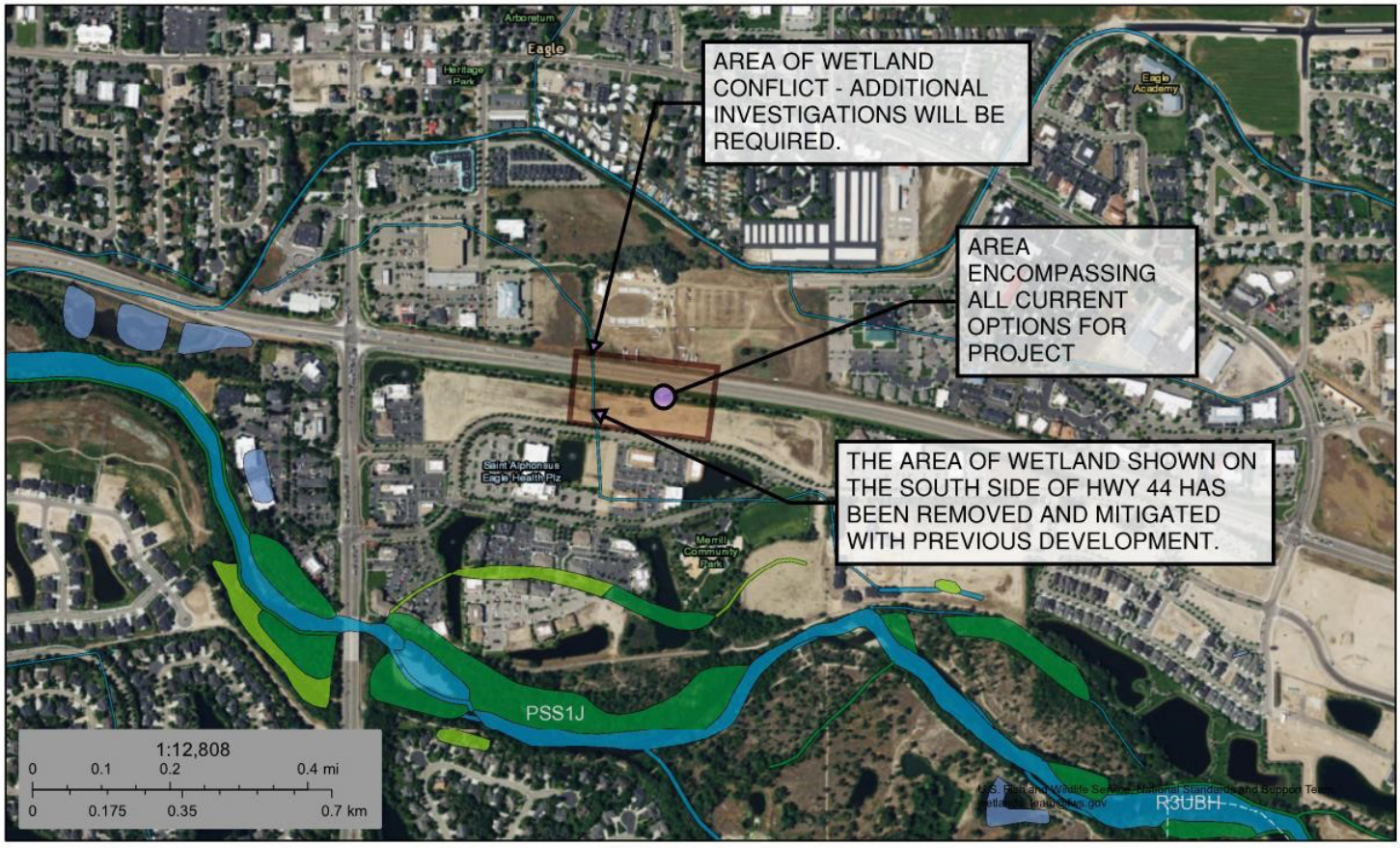
2.02

Wetlands

Area wetlands were reviewed using the National Wetlands Inventory. No wetlands were identified within the area of the project on the south side of Highway 44. The indicated area of wetland conflict to the north of the highway was mitigated when the Ballantyne Canal was recently buried.

U.S. Fish and Wildlife Service
National Wetlands Inventory

National Wetlands Inventory



March 19, 2019

This map is for general reference only. The US Fish and Wildlife

March 19, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

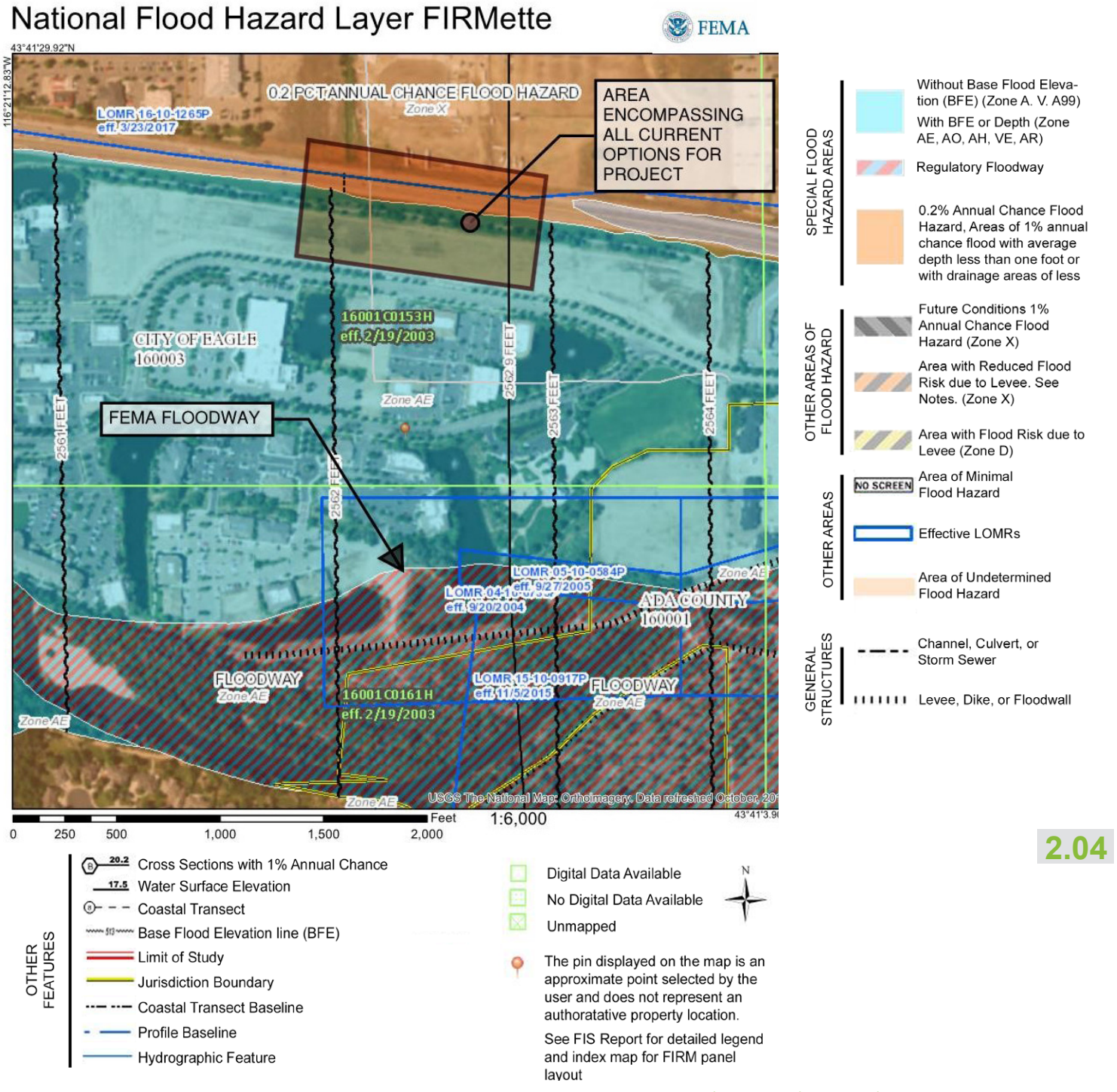
2.03

This map is for general reference only. The US Fish and Wildlife Service is not reponsible for the accuracy or currentness of base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

FEMA Floodway

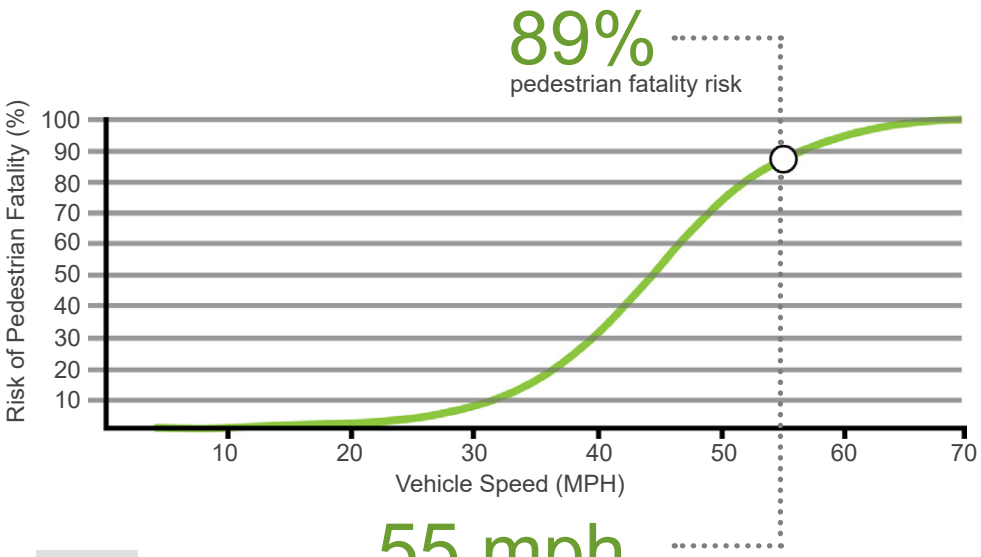
The currently-effective Flood Insurance Rate Maps as published by FEMA were reviewed for the project area. All properties south of Highway 44 are identified within Zone AE (areas with a 1% annual chance of flood hazard) which is a regulated floodplain zone recognized by the City of Eagle. Areas north of Highway 44 are identified in Zone X (areas with a 0.2% annual chance of flood hazard) which does not have any floodplain development requirements under current city of Eagle ordinances.



2.04

Pedestrian Safety Risks

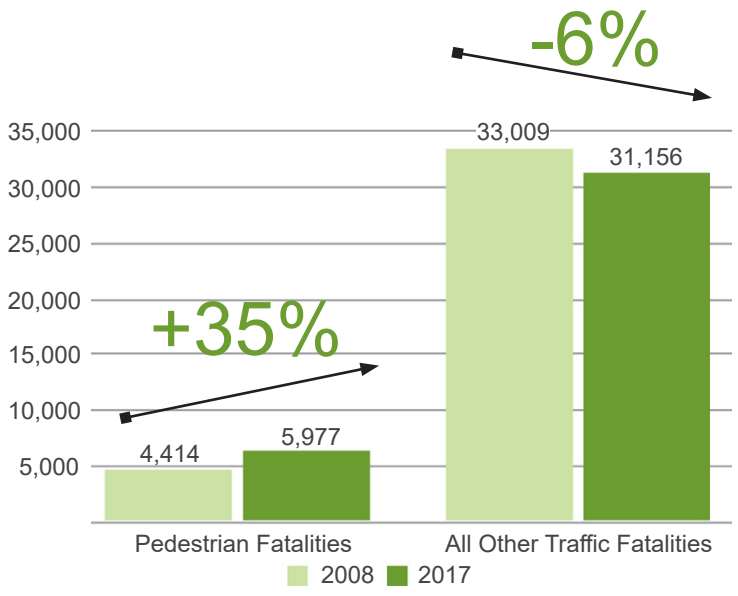
Vehicle Speed and Fatality Risk
While some pedestrian crossings may be discouraged by high travel speeds, the risks for pedestrians increase exponentially at travel speeds above 35 mph. State Highway 44's posted 55 mph speed limit presents an 89% pedestrian fatality rate.



2.05

Source: D.C. Richards Transportation Laboratory

National Safety Trends
The Governors Highway Safety Association compiles data by year and by decade regarding transportation-related fatalities in the United States. Trends in the last decade indicate the relative decline of most traffic fatalities; however, pedestrian fatalities have increased dramatically. Factors such as distracted walking and driving, larger vehicle size, and infrastructure deficiencies all must be considered to provide safe opportunities for pedestrian mobility.



Source: Governors Highway Safety Association

2.06

2.07 Traffic Speeds and Incidents

Roadway classes sourced from COMPASS GIS, based on the 2040 Functional Classification map approved in 2013.
Crash data sourced from ITD through COMPASS GIS. Date range included: 2008-2017.

- Intersection
- Collector Road
- Minor Arterial
- Principal Arterial
- Public Transit Route
- Bus Stop
- High Incident Rate
- Low Incident Rate
- Study Area

The heaviest vehicular traffic through the project area occurs on Highway 44, South Eagle Road, and East State Street. Other adjacent roadways act as collectors for these arterials, funneling traffic volumes to the highest speed and capacity roads. Intersections have the highest rate of vehicle accidents, making them the most hazardous place for both drivers and pedestrians.

Local Traffic Counts

Location	Daily Traffic Count	Date of Measurement
Hwy 44 East of Eagle Rd	27,803	March 2015
Hwy 44 West of Eagle Rd	26,469	September 2014
Eagle Road South of Plaza Dr	21,890	February 2016
Eagle Road North of Island Wood Drive	41,297	March 2015

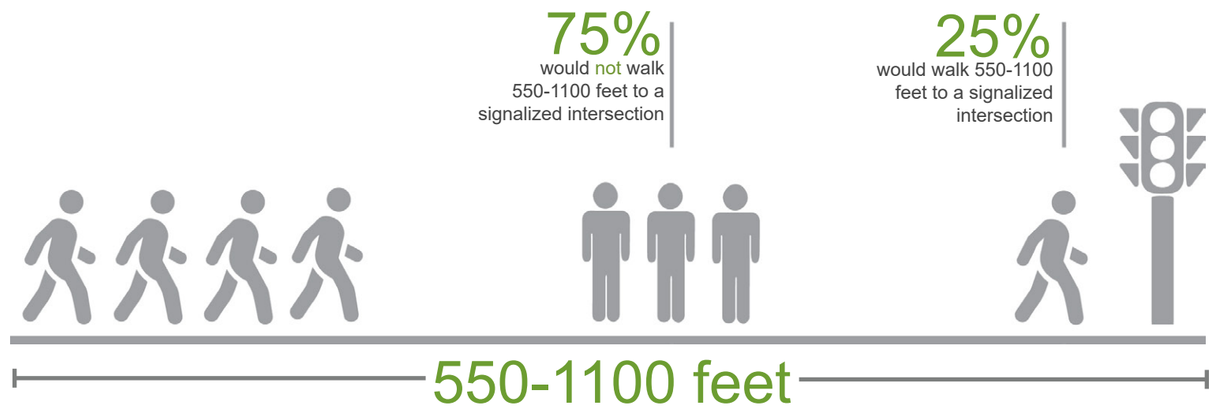
Traffic counts sourced from LandProData.

Local Vehicle Incidents

Location	Collisions	Fatalities
Intersection Hwy 44 and Hwy 55	>150	1
Intersection Hwy 44 and Edgewood Way	>50	1
Highway 44 between Hwy 55 and Edgewood Way	>30	0

Crash data sourced from ITD through COMPASS GIS. Date range included: 2008-2017. Data for recent fatalities sourced from local news reports.
Collisions estimated based on GIS approximated counts.

Pedestrian Behavior for At-Grade Crossings



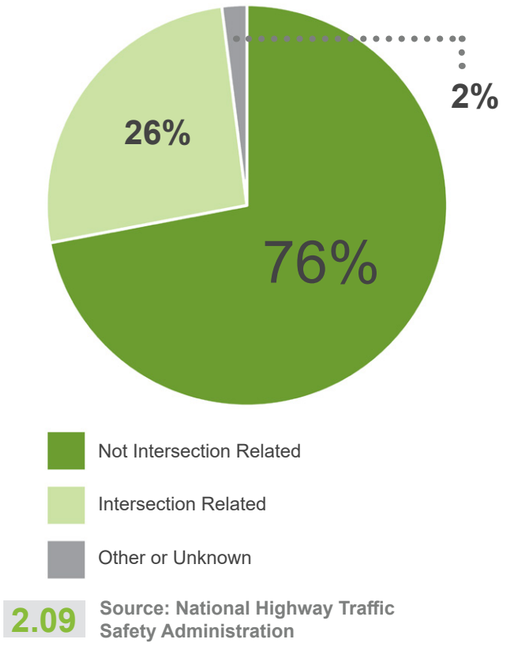
2.08 Source: National Association of City Transportation Officials

Pedestrian Behavior and Walk Distance (Above)

A National Association of City Transportation Officials (NACTO) study surveyed pedestrians to better understand crossing behavior and crossing compliance. The study found that most pedestrians would not walk even the commonly accepted quarter-mile radius to a signalized intersection. As a result, pedestrians would presumably choose to cross illegally at mid-block locations, utilize a vehicle, or avoid crossing altogether.

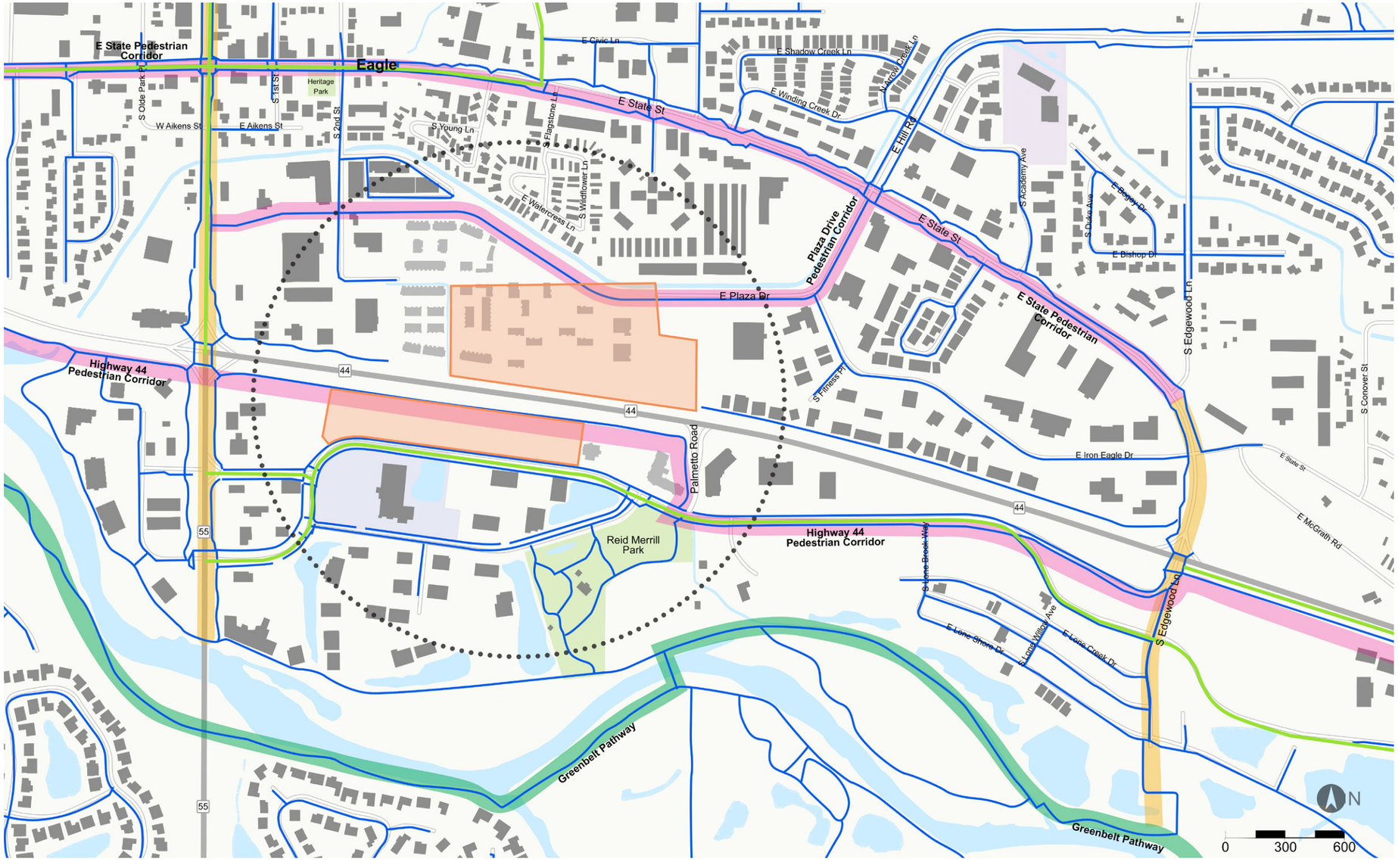
Pedestrian Fatalities at Crossings by Crossing Type (Right)

The Fatality Analysis Reporting System (FARS), a nationwide census of traffic-related fatalities, noted a significant relationship between the location of pedestrian road crossings and fatalities in 2017. Crossings around intersections proved nearly three times less fatal than unprotected mid-block crossings.



2.09 Source: National Highway Traffic Safety Administration

2.10 Bicycle and Pedestrian Infrastructure



Quarter Mile Walk Radius Around North-South infrastructure gap

Pedestrian Infrastructure

Bicycle Infrastructure

Greenbelt Pathway

North-South Pedestrian Corridor

East-West Pedestrian Corridor

Study Area

Pedestrian infrastructure surrounding the site has several effective east-west corridors, the most prominent path being the Greenbelt. A wide pedestrian pathway also exists along sections of Highway 44, but ducks into adjacent developments to the south at hazardous intersections where crossings at the highway are deemed unsafe.

North-south corridors within the area are more limited, with the most infrastructure extant along South Eagle Road stemming from the North Channel of the Boise River and connecting to downtown Eagle. Sidewalks along Edgewood Way also provide some pedestrian connectivity toward East State Street.

A major infrastructure gap exists along the highway between Edgewood Way and South Eagle Road, a stretch of just over a mile. This stretch is five to ten times greater than the distance that, already, only 25% of pedestrians are willing to walk to a safe crossing. No north-south connection exists within this area to unite the Greenbelt with Eagle's Central Business District or the existing and proposed businesses, housing areas, schools, or public amenities.

GIS data for pedestrian and bicycle infrastructure sourced from COMPASS GIS, last updated in April 2019. Additional data derived from site visits.

2.11 Zoning and Parcel Ownership

Map Annotation	Parcel	Primary Owner	Owner Address	Owner City	Total Value	Acres
1	R0119150010	EAGLE HEALTH PLAZA LLC	PO BOX 1559	BOISE, ID 83701-0000	$ 8,121,300.00	2.607
2	R2893850019	BALT COMMERCIAL PROPERTIES FORUM ONE LLC	755 W FRONT ST STE 300	BOISE, ID 83702-0000	$ 64,500.00	0.309
3	R2893850010	BALT COMMERCIAL PROPERTIES FORUM ONE LLC	755 W FRONT ST STE 300	BOISE, ID 83702-0000	$ 3,193,200.00	2.067
4	R2893850030	EAGLE 26 LLC	737 N 7TH ST	BOISE, ID 83702-0000	$ 169,800.00	0.886
5	R2893850041	EAGLE 26 LLC	737 N 7TH ST	BOISE, ID 83702-0000	$ 191,700.00	0.8
6	R2893850050	EAGLE 26 LLC	737 N 7TH ST	BOISE, ID 83702-0000	$ 202,400.00	1.056
7	R2893850021	EAGLE 26 LLC	737 N 7TH ST	BOISE, ID 83702-0000	$ 120,000.00	0.726
8	R5760220060	EAGLE RIVER OWNER'S ASSOCIATION INC	3101 N CENTRAL AVE	PHOENIX, AZ 85012-0000	$ -	1.231
9	R5760240010	WESTMARK CREDIT UNION	PO BOX 2869	IDAHO FALLS, ID 83403-2869	$ 1,344,500.00	0.821
10	R5760250161	EAGLE RIVER LLC	435 SHORE DR STE 120	EAGLE, ID 83616-0000	$ 331,600.00	0.692
11	R5760250155	EAGLE RIVER LLC	435 SHORE DR STE 120	EAGLE, ID 83616-0000	$ 328,700.00	0.686
12	R5760250165	EAGLE RIVER LLC	435 SHORE DR STE 120	EAGLE, ID 83616-0000	$ 331,600.00	0.692
13	R5760250170	EAGLE RIVER LLC	3101 N CENTRAL AVE STE 1390	PHOENIX, AZ 85012-2643	$ 998,000.00	5.455
14	R5760250184	EAGLE RIVER LLC	3101 N CENTRAL AVE STE 1390	PHOENIX, AZ 85012-2643	$ 512,300.00	2.8
15	R5760240024	R2M PROPERTIES LLC	3015 SALEM AVE SE	ALBANY, OR 97321-0000	$ 2,177,300.00	1.4
16	R5760250126	EAGLE RIVER HOTEL II LLC	PO BOX 8506	BOISE, ID 83707-0000	$ 1,380,000.00	2.88
17	R5760250151	EAGLE RIVER LLC	435 SHORE DR STE 120	EAGLE, ID 83616-0000	$ 542,400.00	1.132
18	R5760250190	EAGLE RIVER OWNER'S ASSOCIATION INC	3101 N CENTRAL AVE	PHOENIX, AZ 85012-0000	$ -	0.974
19	R6951340100	ELKRIDGE PROPERTIES LLC	PO BOX 298	STAR, ID 83669-0000	$ 577,000.00	0.909
20	R6951340300	EAGLE PAVILION LLC	705 CHARDIE RD	BOISE, ID 83702-0000	$ 2,917,200.00	1.468
21	R6951340400	D L EVANS BANK	PO BOX 1188	BURLEY, ID 83318-0000	$ 978,800.00	0.638
22	R6951340500	ROGERS EDYTHE H REVOCABLE TRUST	3905 SANDBAR LN	EAGLE, ID 83616-0000	$ 682,100.00	0.345
23	R6951340600	ROGERS EDYTHE H REVOCABLE TRUST	3905 SANDBAR LN	EAGLE, ID 83616-0000	$ 193,100.00	0.484
24	R6951340200	W & H LIMITED LIABILITY CO	720 W 20TH ST	PITTSBURG, KS 66762-0000	$ 826,100.00	0.379
25	S0516212426	EAGLE 26 LLC	737 N 7TH ST	BOISE, ID 83702-0000	$ 2,402,100.00	15.425
26	S0516223100	ABS ID-O LLC	1371 OAKLAND BLVD STE 200	WALNUT CREEK, CA 94596-0000	$ 299,500.00	0.625
27	S0516223120	JOSHNIK LLLP	3184 W ELDER ST	BOISE, ID 83705-0000	$ 374,500.00	0.201

2.12 Zoning and Parcel Ownership

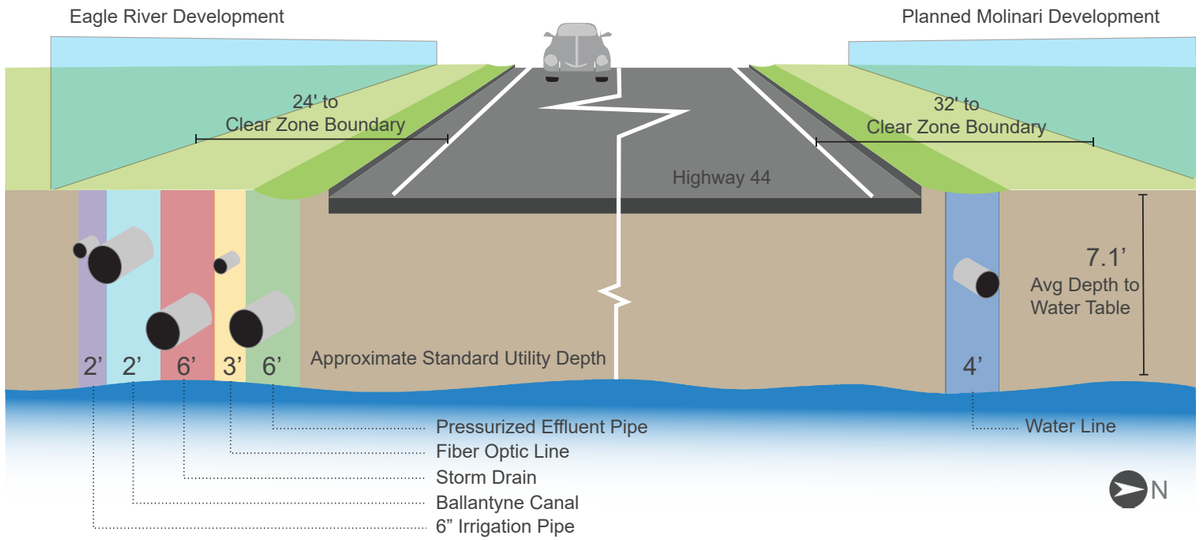
M-1 Light Industrial
CBD **Central Business District**
MU **Mixed Use**
PS Public Space
C-1 Commercial
C-2 **Commercial**
C-3 Commercial
R-4 Residential
RUT Rural Urban Transition
A-R Agricultural/Residential
A Agricultural

The potential siting area for an over/undercrossing along State Highway 44 is zoned as Mixed Use, C-3 Commercial, or as a part of the Central Business District. The density of existing and proposed businesses coupled with ample housing in the area make the location ideal for pedestrian traffic. Additionally, mixed use developments like the proposed Molinari Park are often advertised to result in diminished vehicle dependency, a strong selling factor in an area with rapid growth and a burgeoning commuter population.

Much of Eagle has a relatively even daytime to nighttime population split (9,792 daytime and 8,761 nighttime in the project area, according to Esri's 2016 GIS data), meaning it's possible for people to live and work within the same census tract. Providing better pedestrian connectivity through hazardous barriers like Highway 44 could help residents to take full advantage of this proximity, further reducing vehicle congestion and improving quality of life for Eagle's residents and employees.

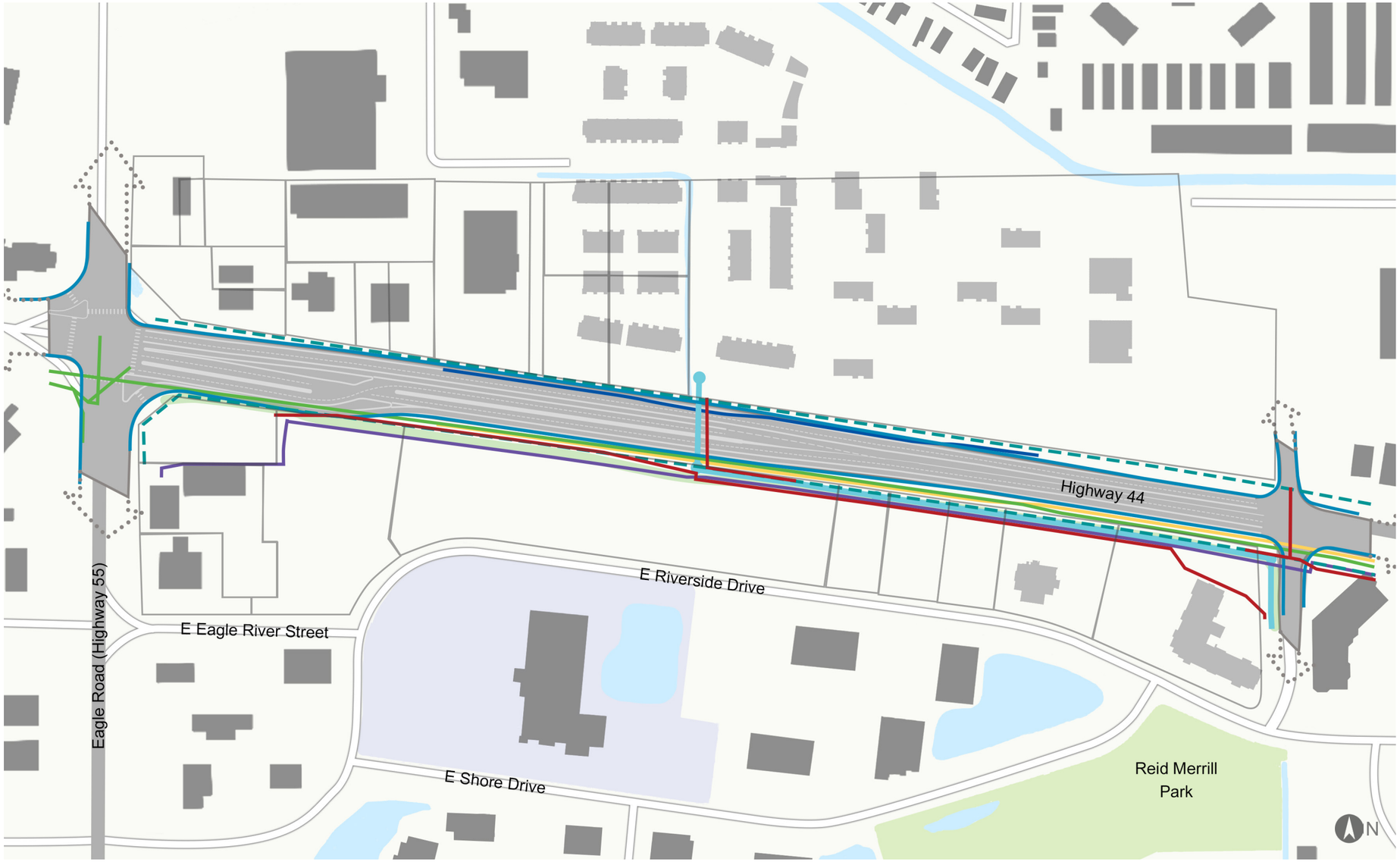
Zoning data from AdaCountyGIS, last updated in 2016. Approximate parcel boundaries and parcel information sourced from Ada County Assessor's Office, through LandProData.

2.13 Utility Section Cut



Depths to top of utilities shown above are located based on a combination of standard depths and average depth located by TO Engineers for the pressure effluent pipe installed along Highway 44. These depths are approximations only. A detailed survey or excavation is required to locate exact depths to utilities.

2.14 Existing Utilities



- Half CFI Pavement Markings
- Storm Drain
- Right of Way
- Edge of Pavement
- 6” Irrigation Pipe
- Sanitary Sewer
- Ballantyne Canal
- Water Line
- Greenbelt Pathway
- Fiber Optic Line
- Existing Building
- Proposed Building

There currently are a significant number of existing utilities flanking Highway 44. A grade-separated crossing would either need to avoid or relocate these, which would be difficult in some cases. In particular, the buried Ballantyne Canal represents a serious barrier to an overpass’s structural footings or any part of an underpass. Including a longer span on a pedestrian overpass could bridge over the utilities, but would likely be more costly in terms of materials and engineering. An underpass would either need to be buried deeper than existing utilities, or have utilities relocated. There is some limited area to the west of the study area to site an underpass without encountering the Ballantyne Canal.

56 ft
typical width occupied by utilities from planned edge of pavement on the south side of Highway 44

13 ft
typical width occupied by utilities or right of way from planned edge of pavement north side of Highway 44

2.15 Overpass and Underpass Siting Overview

Possible overpass siting area

Possible underpass siting area

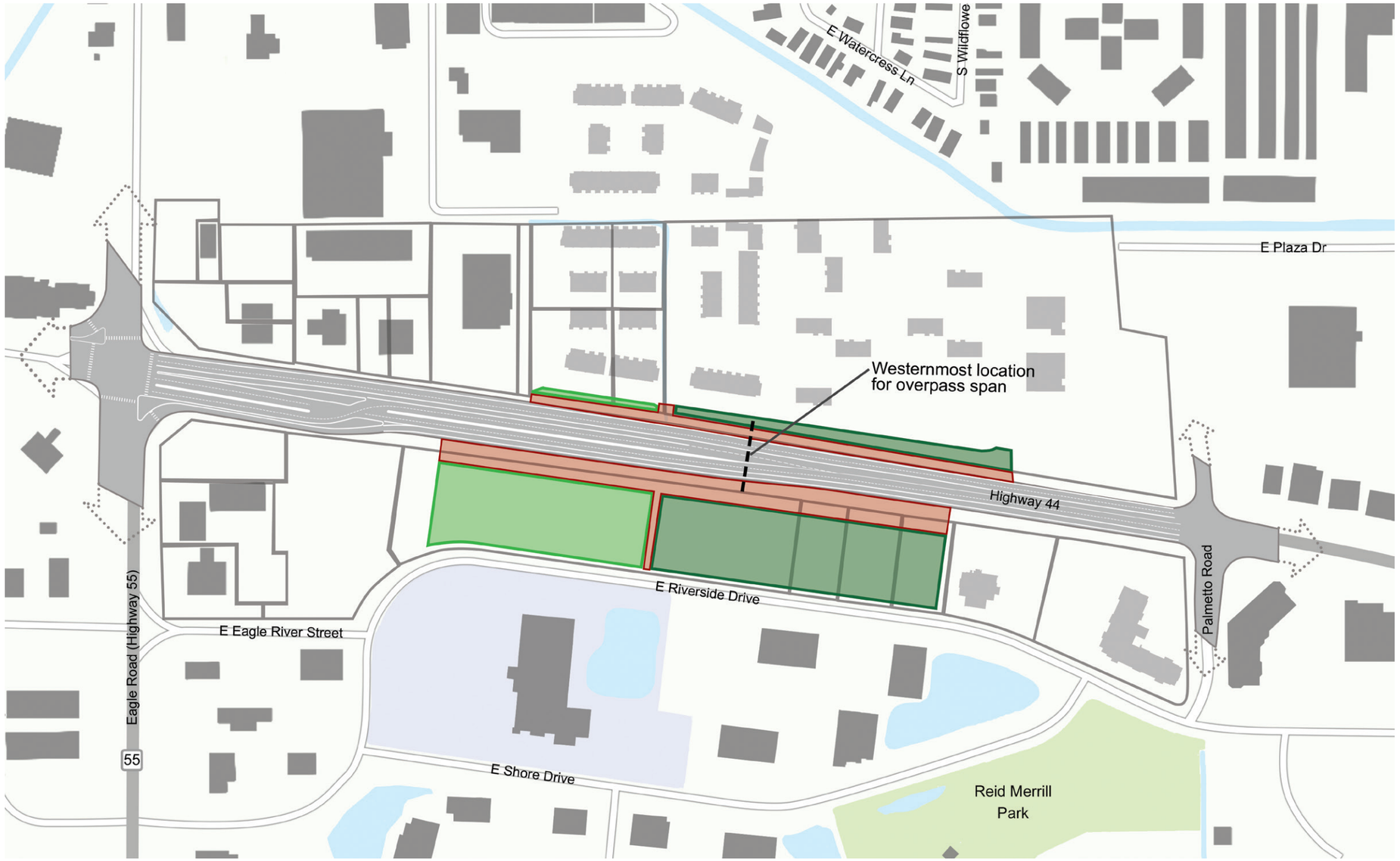
Utility zone

Westernmost location for overpass span

Spatially, siting constraints along State Highway 44 are attributable to three primary sources: existing structures and utilities, planned developments, and the highway itself. No developed parcels were included in the siting area for the grade-separated crossing.

Siting is further informed by the existing and proposed locations of pedestrian infrastructure, which would ideally be connected by a new crossing. Hazardous intersections between high speed roadways, such as Highways 44 and 55, are less desirable locations for a pedestrian crossing. Instead, pedestrians could be moved down safer, lower-speed corridors on the interior of planned developments.

Finally, locating an overpass too far west could potentially obstruct signals and signs for the planned half continuous flow intersection (half CFI) at the intersection of Highways 44 and 55, meaning that only an underpass would be reasonably feasible west of the Ballantyne canal. Any overhead structure with a 17 ft clearance must be a minimum of 300 ft from proposed CFI signage. This location is marked on the map with a dashed black line. Overpass ramps or stairs may extend into the underpass siting area, but it is not recommended to locate footings over the Ballantyne Canal or other utilities. An underpass would conflict with CFI drainage structures regardless of location, but this could be mitigated by expanding drainage structures elsewhere.



195 ft
average minimum span for an underpass, based on combined utility and roadway width

178 ft
average minimum span for an overpass, based on utilities, roadway widths, and clear zones

Design Requirements 03

Pedestrian and Bicycle Overpasses

Overpasses span obstacles such as roads, freeways, waterways, or railroads above grade while providing adequate clearance for traffic or natural features below. These structures improve connectivity while providing high visibility.

Site-Specific Summary:

Cost

» The average expected cost for a pedestrian overpass is about $10,000 per linear foot

Benefits

» Requires less earthwork than an underpass
» Minimizes drainage issues and lighting costs
» Minimizes conflicts with utilities
» Provides visible wayfinding symbol
» Offers opportunity for attractive architectural form and public artwork
» Can provide a unique experience to users
» No risk of reintroducing Zone AE flood plain on north side of highway
» Few expected effects on the planned half CFI

Drawbacks

» Requires high clearance (17 ft ITD minimum, 17.5 ft preferred) over the highway
» Requires long ramps that can be inconvenient or difficult for differently-abled people to use
» Either requires covering for all-season, all-weather use, or seasonal maintenance to remove snow, leaves, and other debris
» No existing topography change exists to provide natural ramps
» Potential reduction of business or commercial visibility from highway

Pedestrian Overcrossing | Berkeley, CA
Courtesy of Google Earth

Attached Overpasses

Attached overpasses include structures or buildings on one or both sides of the span. These structures can improve accessibility and weather protection for all users, but will also require additional structural engineering and collaboration with developers. This solution is also feasible for an undercrossing, but is not recommended for this site due to dewatering needs.

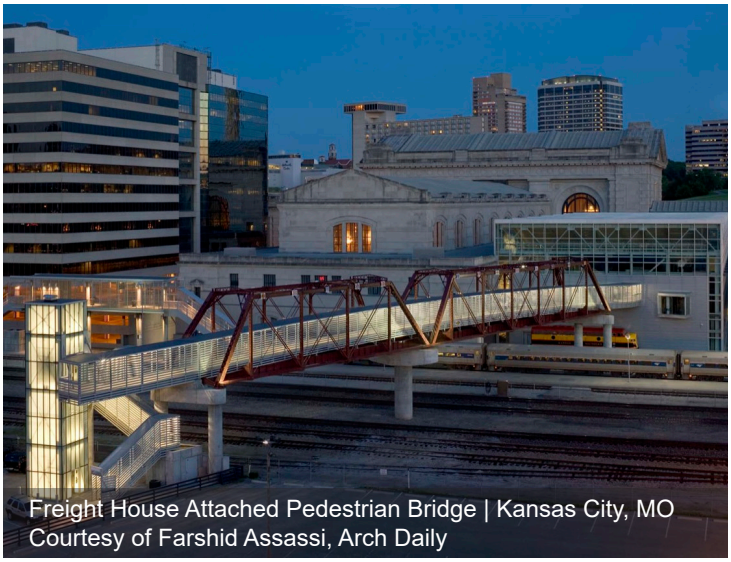
Site-Specific Summary

Benefits

- Offers improved ADA accessibility and convenience to maximize usership
- Minimizes footprint; no ramps required
- Offers opportunity for bicycle or after-hours use via exterior stairs with bike runnels
- Offers potential area for additional amenities like commercial space or public restrooms

Drawbacks

- Any elevator breakdowns result in no ADA access
- Significant maintenance costs
- Creates significant cost addition to a building
- Requires joint effort with developer; may alter developers' existing plans



Freight House Attached Pedestrian Bridge | Kansas City, MO
Courtesy of Farshid Assassi, Arch Daily

Attached Pedestrian Skyway | Hong Kong
Courtesy of Yoos and James, Places Journal

Ramp Strategies

A challenge in constructing a pedestrian over- or underpass is the long ramp lengths that occur when a crossing must reach a significant clearance height or depth. Switchbacks, spirals, stairs, and elevators are all options to mitigate these lengths and make the crossing more attractive to users.

Site-Specific Summary

Freestanding or Building-Integrated Elevator

- » ADA-accessible and easy to use
- » Alternative access, such as bike runnels (see appendices) should be provided for bicyclists
- » Relevant to both over- and undercrossings
- » Additional construction and maintenance costs
- » Potential security issues for attached building

Lafayette Pedestrian Bridge, by Merryman Barnes Architects
Portland, OR | Courtesy of kpff.com

Ramp Spirals

- » Self-covering – reduces weather covering needs
- » Can be exhausting if landings are not included

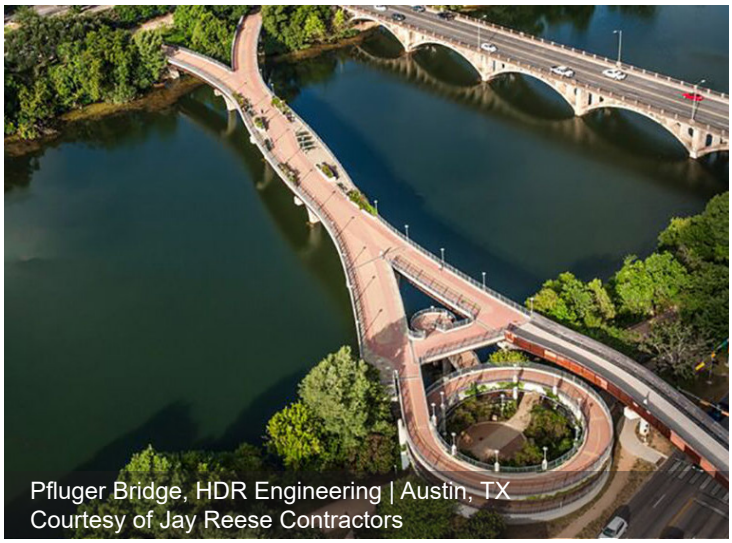
Ramp Switchbacks

- » Reduce total length consumed by a ramp
- » Can be frustrating or exhausting for users

Stairs

- » Should exist in addition to ADA infrastructure
- » Common solution, relevant to both overcrossings and undercrossings
- » Can be equipped with bike runnels, narrow channels in stairways to facilitate for bike tires
- » Lower construction and maintenance costs versus elevators
- » Reduces the footprint required to achieve an elevation change

BP Pedestrian Bridge, by Frank Gehry | Chicago, IL
Courtesy of ArchiTravel



Pfluger Bridge, HDR Engineering | Austin, TX
Courtesy of Jay Reese Contractors

Pedestrian and Bicycle Underpasses

Underpasses span obstacles such as roads, waterways, or railways below grade while providing adequate clearance, lighting, and drainage for pedestrian and bicycle traffic. These structures provide improved connectivity with discrete visual form.

Site-Specific Summary:

Cost

- The average cost for a pedestrian underpass is between $27,000 per linear foot
- Additional cost for an undercrossing at the specified study area can be expected, based on dewatering, utility relocation, and construction shoring needs

Benefits

- Requires slightly shorter ramps and fewer stairs
- Unobtrusive form blends with surrounding built and natural features

Drawbacks

- Will require relocation of multiple utilities or the Ballantyne Canal

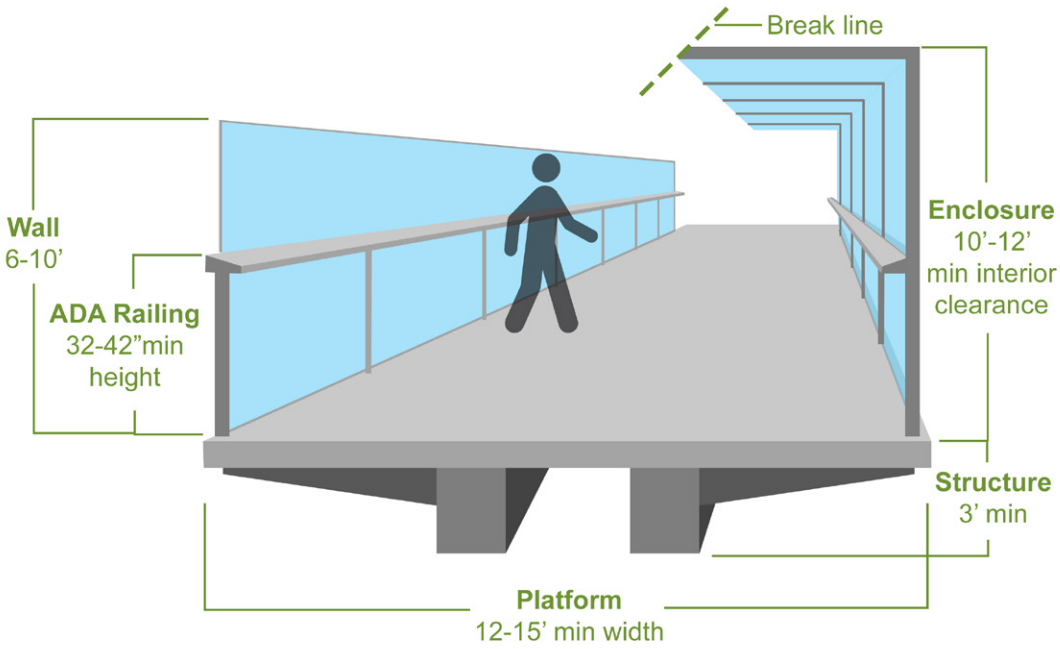
Drawbacks Continued

- Will exist within the water table year-round, with additional periodic flooding issues, requiring constant pumping and other flood prevention measures
- Smaller feasible siting area results in 8% ramps with landings rather than the preferred 5% with no landings for paths
- Requires lighting at all times
- Crime and vandalism can be more common than in overpasses
- No natural topography exists to provide natural ramps toward the undercrossing
- May feel unsafe or claustrophobic, deterring use

Basalt Ave Pedestrian Underpass | Basalt, CO
Courtesy of the City of Basalt

Woy Woy Pedestrian Underpass | Gosford, Australia
Courtesy of Saunders Civibuild Engineering

3.01 Overpass Dimensioning and Requirements for Enclosures



Wall heights will vary based on purpose. To keep pedestrians from falling, 6 ft with a 42" hand rail is typically sufficient. To deter users from climbing fences or throwing objects to the road below, a 10 ft height is recommended.

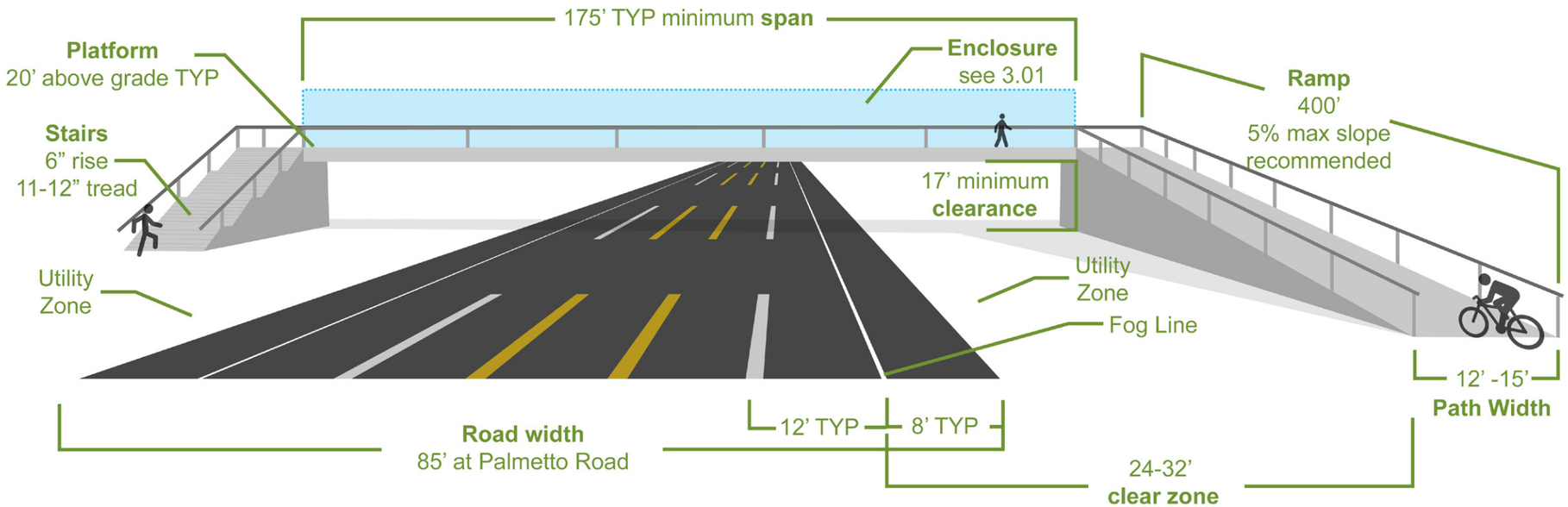
ADA Railings for handholds must be provided along ramps, and are strongly recommended along the span of the overcrossing.

Platforms should accommodate a minimum travel width of 10-12 ft with an additional 1-1.5 ft for structure and overhang at either side. Therefore, a total platform width of 12-15 ft is recommended.

Structure for an overpass must be engineered to safely support a long span (typically upwards of 200 ft for this site).

Enclosures can be used to best mitigate climbing, jumping, throwing objects, or other inappropriate use of the overpass. A 10 ft interior clearance is recommended to allow bicyclists to move comfortably and safely.

3.02 Overpass Dimensioning and Requirements



Stairs are recommended for both sides of the overpass, but are shown at only one location in the graphic for clarity. Considering the physical exertion required to reach a 20 ft grade change, steps with a 6” rise and 12” tread are recommended, as opposed to the 7” rise and 11” tread per ADA minimum standards.

Platforms can vary in width from the standard path width, becoming wider to accommodate furnishing zones where users can rest and enjoy the space.

Spans are further elaborated upon in figure 3.01.

Clearance above the road is set at 17 ft, per the Idaho Transportation Department’s highway standards, though 17.5 ft is preferred.

Ramps are recommended at 5%, rather than the ADA maximum of 8.3% with landings, to provide a comfortable and consistent grade for users.

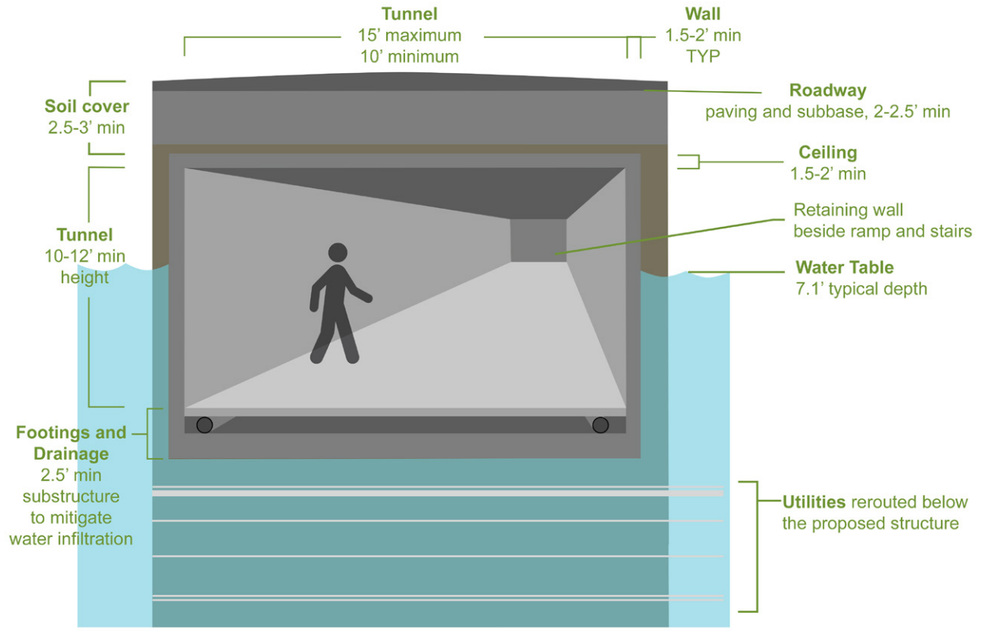
Path Widths should accommodate travel in two directions by a variety of users (bicyclists, pedestrians, joggers, etc).

Clear zones are measured 32 ft out from the fog line on the north side of the highway, and 24 ft from the fog line on the south side. These areas typically include a number of underground utilities, and footings must not be located in this area. Utilities may also be located well outside the clear zone area, see figure 2.14.

Footprint Area: the minimum area for an overpass ramp, landing, and stairway on either side of the highway is 3,750 square feet (with a 15 foot structure width).

Span Area: the minimum area for an overpass span is 2,625 square feet. (with a 15 ft structure width).

3.03 Underpass Dimensions and Requirements for Tunnels



Soil Cover depth is based primarily on the above infrastructure. It is recommended to relocate utilities as opposed to locating the crossing underneath existing utilities, since the former method permits the shorter ramp lengths that are a major benefit of underpasses.

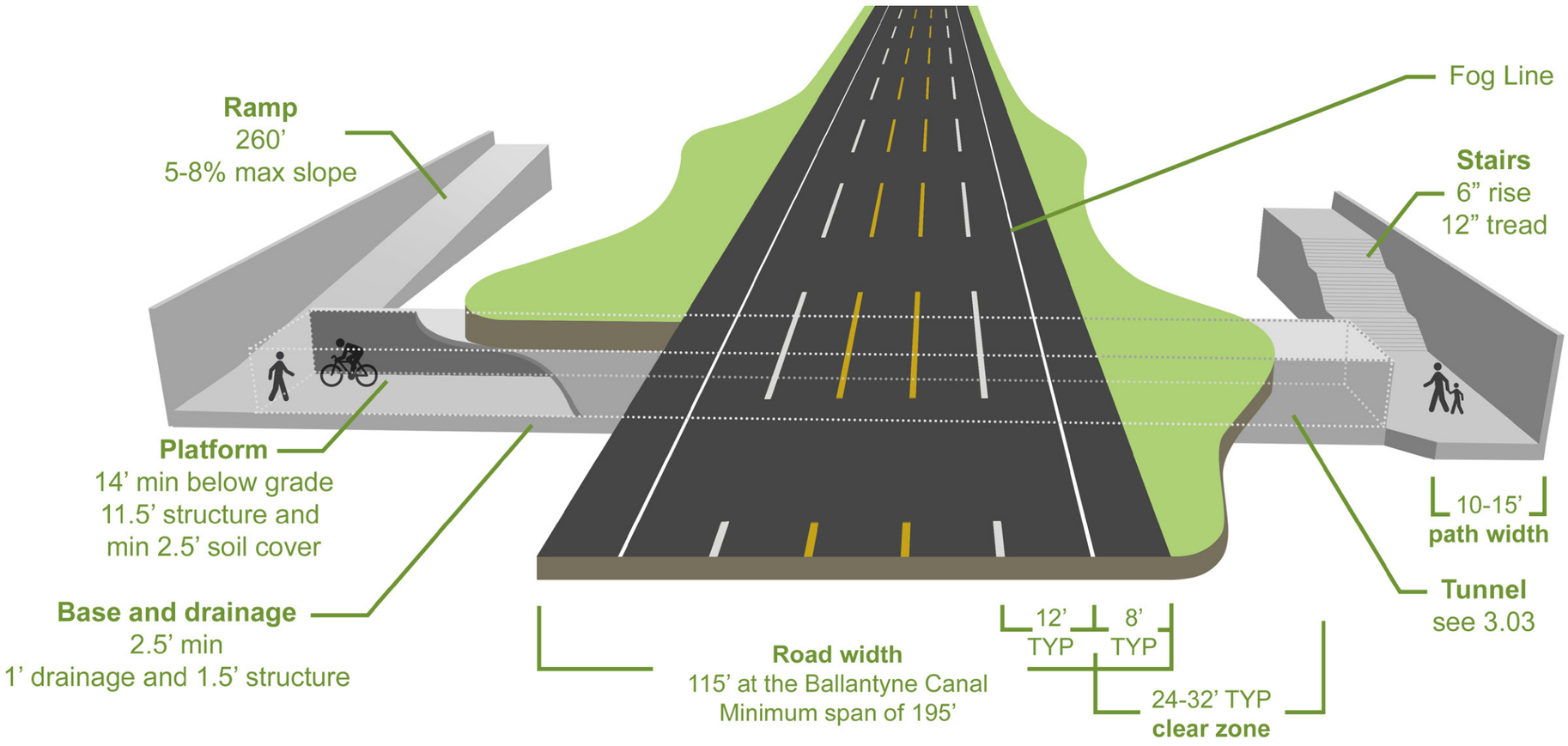
Tunnel clearance should follow the same standards as overpass enclosures, with a 10 ft minimum vertical clearance for bicyclists.

Footings and Drainage for the underpass must be deep enough to provide a stable base while including pumping infrastructure to mitigate potential water infiltration into the underpass from the high water table.

Water Table standard depth was retrieved from data by TO Engineers.

Utilities would need to be relocated below the underpass, except for the Ballantyne Canal to the east, to minimize the footprint of the project and keep the underpass at a reasonable depth.

3.04 Underpass Dimensioning and Requirements



Ramps would ideally be set at 5% for comfort and consistency. However, due to the significant depth required for an underpass, an 8% ramp with landings spaced at 30 ft would permit the smallest possible footprint.

Platform depth is set at 14 ft below grade, including 3 ft of soil cover to avoid existing utilities, 1 ft of structure for the tunnel, and 10 ft of clearance within the tunnel.

Footings and Drainage structures must be provided with adequate space for pumping infrastructure to ensure structural stability and address significant water infiltration risks inherent to the high water table of the site (see figure 3.03).

Clear Zones, as with an overpass, are measured 32 ft out from the fog line on the north of the highway and 24 ft from the fog line to the south, and typically include space for utilities.

Footprint Area: the minimum area for an underpass ramp, landing, and stairway on either side of the highway is 3,264 square feet.

Span Area: the minimum area for an underpass span is 2,340 square feet.

Overpass vs. Underpass Performance Comparison

	Overpass	Underpass
Pedestrian and Bike		
Number of stairs	🛑	🟢
Span length	🟢	🛑
Ramp length	🛑	🟢
Maximum ramp grade	🟢	🛑
Total footprint area	🛑	🟢
Quality of user experience	🟢	🛑
Required hours of artificial lighting	🟢	🛑
Vehicular Disturbance		
Construction disruption duration/severity	🟢	🛑
Landscape and Buffering		
Potential for protected public space	🟢	🛑
Aesthetic		
Potential for public art	🟢	🟢
Potential for designed city signage/branding	🟢	🛑
Visual obstruction to developments	🛑	🟢
Feasibility		
Basic structure cost	🟢	🛑
Constructibility	🟢	🛑
Maintenance requirements	🟢	🛑
Dewatering needs	🟢	🛑
Effects on utility relocation	🟢	🛑
Interference with planned half continuous flow intersection	🟢	🛑

See Figure 4.01 and description of the selection process for additional detail.

🟢 Good Performance

🟡 Moderate Performance

🛑 Poor Performance

Two or more concepts both performing at the same level (poor, moderate, or best) are shown with the same icon.

Design Concepts 04

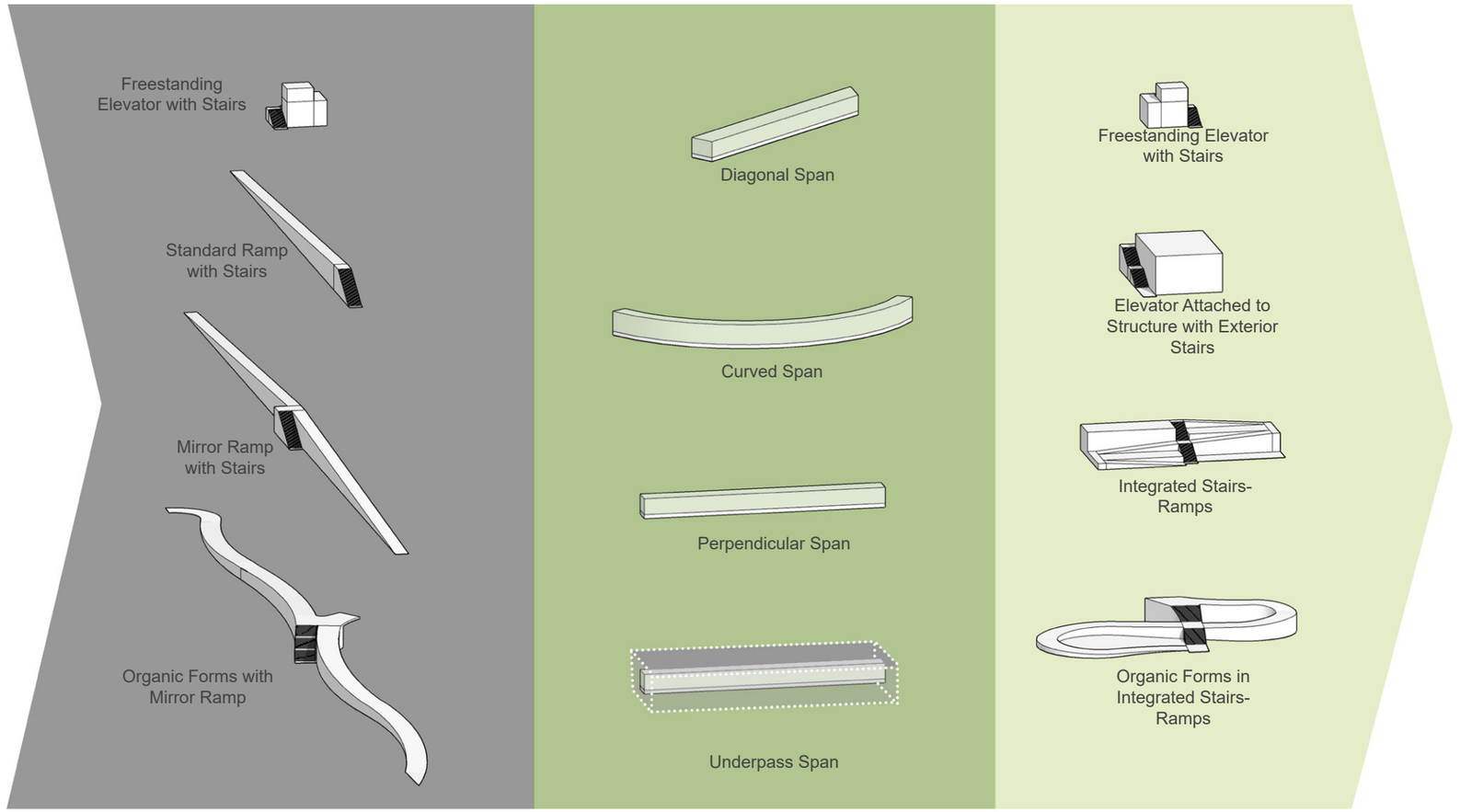
Concept Introduction

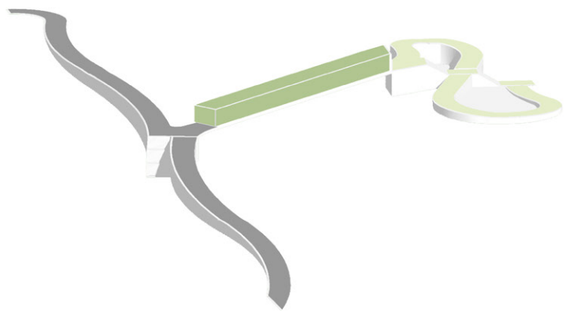
The preceding site inventory and analysis has laid out a number of opportunities, including prime pedestrian routes and possibilities for additional public amenities, and constraints, such as the wide utility zone and high local water table for the study area. To best articulate a crossing solution within this area, which will take advantage of opportunities while mitigating constraints, four high-level concepts have been developed to test potential crossings. These concepts include only enough detail to communicate a basic design, which is then analyzed for relative performance and approximate cost.

Each concept represents a category of solutions: an overpass with additional public amenities (landscaped area, public space, etc.), a standard overpass using ramps and stairs with minimal additional amenities, an overpass with elevators and stairs, and finally an underpass. As the modularity diagram on the following page suggests, the basic components of these solutions can be rearranged based on preference or necessity. Cost estimates are similarly modular to provide the greatest degree of efficiency and utility.

4.01 Concept Modularity

Concepts have been generated to provide a degree of flexibility as the city and public further refine their desires for an over- or undercrossing. Components therefore are somewhat modular, and can be rearranged to provide the most attractive and efficient solution. Icons at the right show a number of components used to develop the concepts shown on subsequent pages.





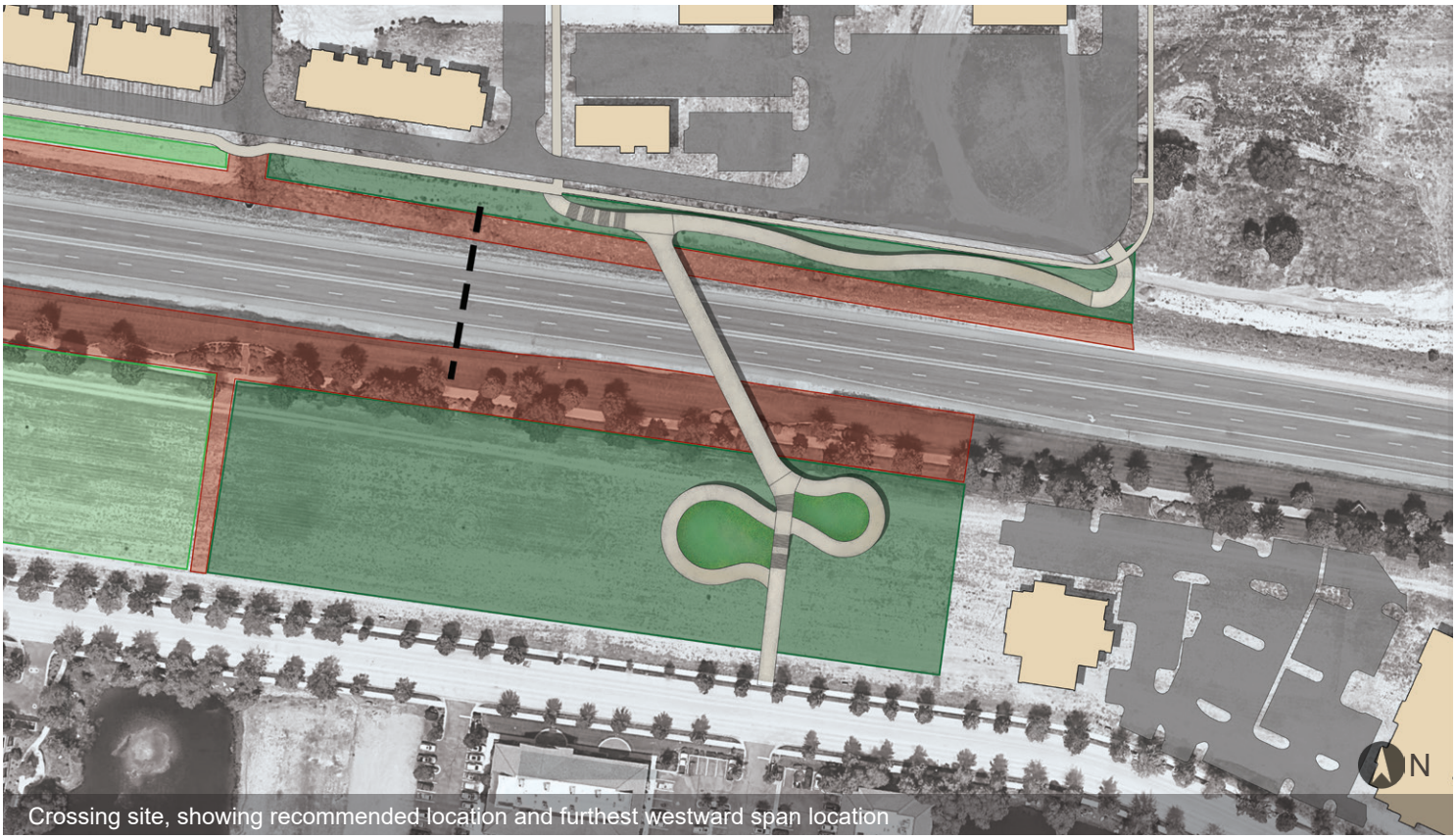
Concept A – Overpass with Public Amenities

This concept illustrates a diagonal overpass that includes both stairs and ramps to achieve the required clearance elevation. The area north of Highway 44 features a linear ramp to provide sound-buffering and visual screening between potential development on adjacent parcels and the highway. The area south of Highway 44 includes ramp switchbacks with integrated stairs to minimize the required footprint while maximizing public space. The diagonal crossing could be oriented to frame desired views and direct pedestrian connections along identified corridors.

Concept A | Bird's Eye View Facing East

Proposed structures shown for Molinari Park and Eagle River are approximations only. These graphics are used to show the crossing in a more accurate future context.

Concept A | View of overpass from Highway 44



Crossing site, showing recommended location and furthest westward span location

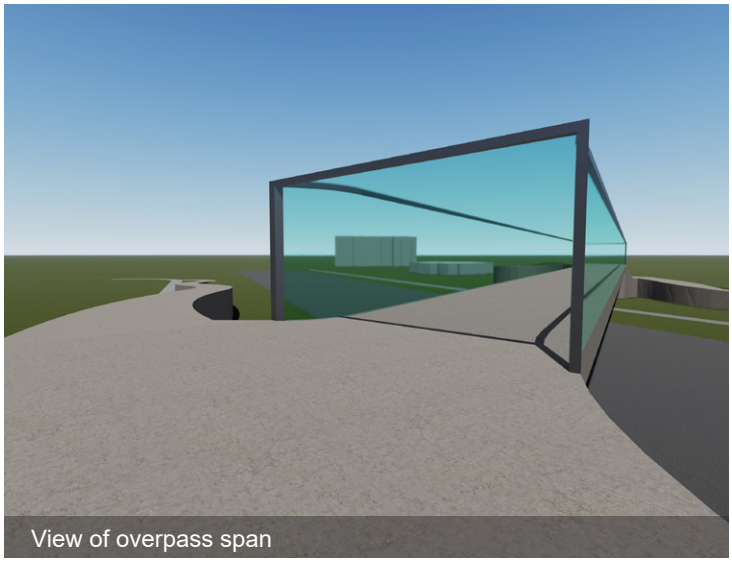
Possible overpass siting area

Possible underpass siting area

Utility zone

Westernmost location for overpass span

	Square Feet	Acres
Total Footprint Area	22,600	0.52
North Footprint	7,700	0.18
South Footprint	14,900	0.34



View of overpass span

Planter areas/public space integrated in overpass

Advantages

» Ramp on north side could utilize proposed berming to separate the highway from Molinari Park
» Switchbacks minimize view obstructions from Highway 44 to Eagle River development
» Diagonal crossing layout over the highway could be easily manipulated for signage or aesthetic benefit
» Connects existing and proposed pedestrian corridors effectively, conveying pedestrians directly between Eagle River and Molinari Park
» Wider platform (20 ft) can be used for a furnishing area, improving user experience
» Integrated stairs and ramp are convenient for users

Disadvantages

» Large footprint on the south side of the highway
» Long ramp to the north creates a visual and access barrier – this could be a benefit or detriment depending on goals of the proposed development
» A wider platform incurs a higher construction cost
» Diagonal crossing angle increases overall structure span

Concept A

	North Side	South Side
Pedestrian and Bike		
Number of stairs	▲	▲
Span length	⬢	
Ramp length	●	●
Maximum ramp grade	●	
Smallest turn radius on ramp (for bicycle traffic)	⬢	
North/south footprint areas	▲	⬢
Total footprint area	⬢	
Quality of user experience	●	
Required hours of artificial lighting	▲	
Vehicular Disturbance		
Distance from span to closest half CFI overhead signage	●	
Construction disruption duration/severity	▲	
Landscape and Buffering		
Potential for protected public space	●	
Total square footage of landscaped area within structure/public space	●	
Provision of a partial vertical buffer along Molinari development	▲	
Aesthetic		
Potential for public art	●	
Potential for designed city signage/branding	▲	
Visual obstruction to developments	⬢	▲
Feasibility		
Basic structure cost	▲	
Constructibility	●	
Maintenance requirements	▲	
Dewatering needs	●	
Effects on utility relocation	●	
Interference with planned half continuous flow intersection	●	

● Good Performance

▲ Moderate Performance

⬢ Poor Performance

Two or more concepts both performing at the same level (poor, moderate, or best) are shown with the same icon.

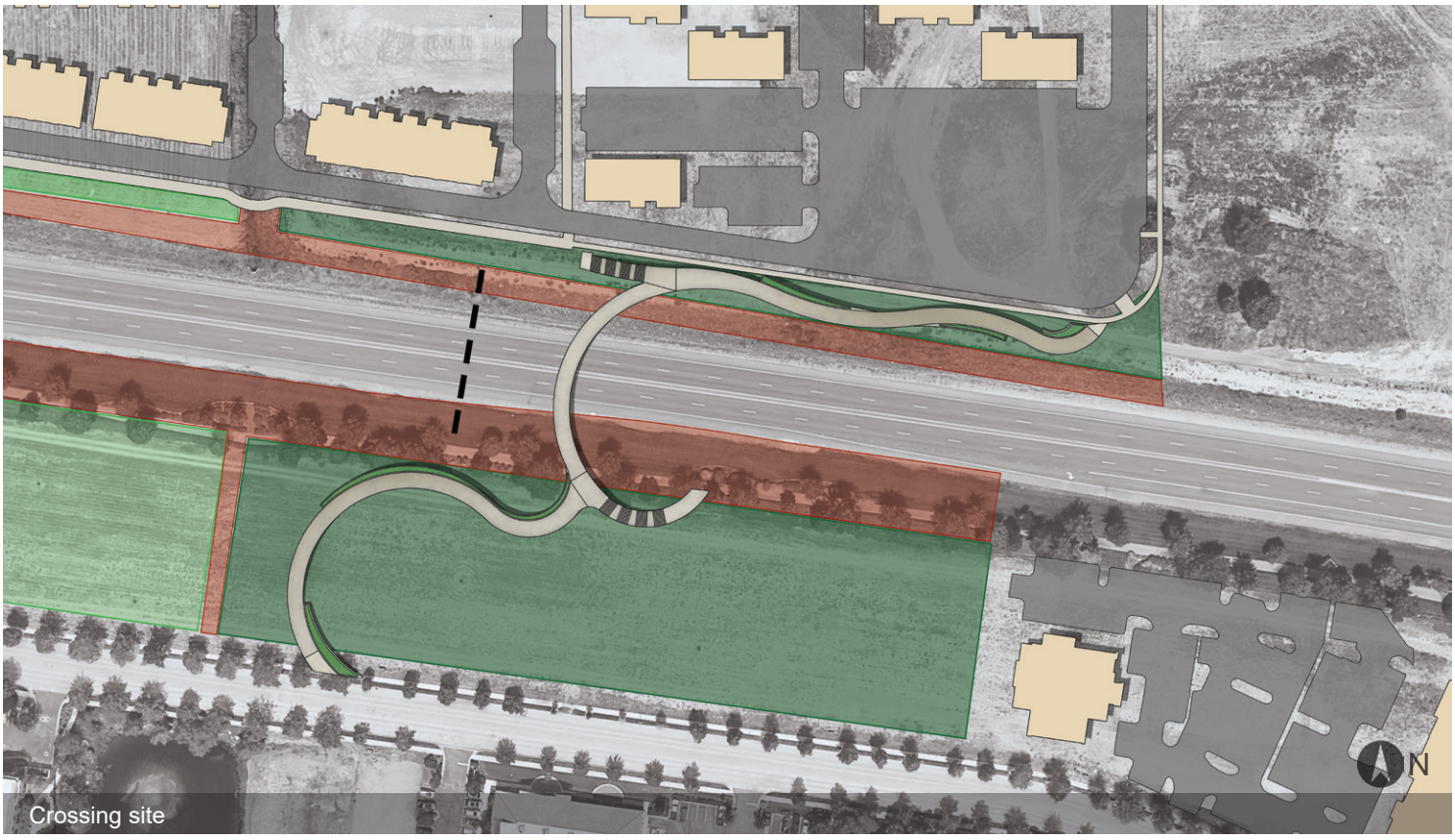
Concept B – Overpass

Concept B features a sculptural overpass that efficiently moves pedestrians through the use of stairs and ramps. Curving ramps north and south of Highway 44 evoke the river's form and provide visual interest both for users and vehicular traffic below. The ramp to the south skirts carefully across the vacant parcels, consuming minimal area while buffering highway noise. Limited additional public amenities are shown, making this concept both space-efficient and cost efficient, though it is recommended to include such amenities as benches, public space, and public artwork.

Concept B | Bird's Eye View Facing East

Proposed structures shown for Molinari Park and Eagle River are approximations only. These graphics are used to show the crossing in a more accurate future context.

View of overpass from Highway 44



Crossing site

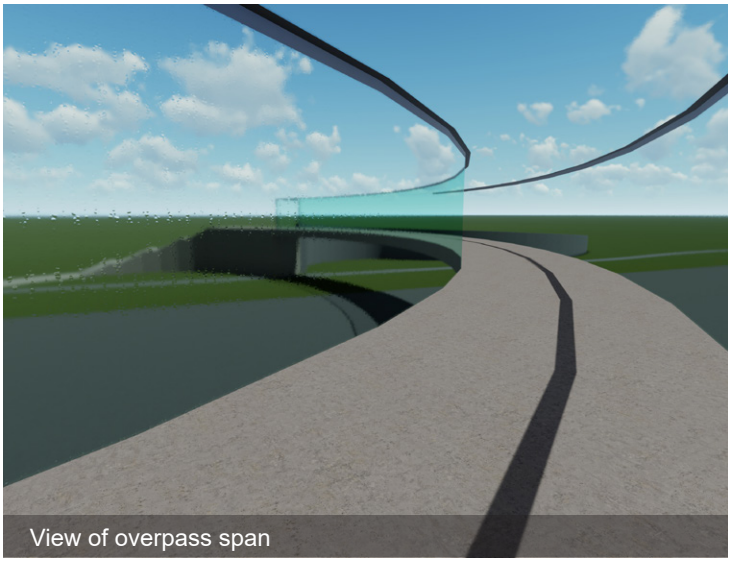
Possible overpass siting area

Possible underpass siting area

Utility zone

Westernmost location for overpass span

	Square Feet	Acres
Total Footprint Area	15,500	0.36
North Footprint	7,650	0.18
South Footprint	7,850	0.18



View of overpass span

Public seating and planter space

Advantages

» Unique layout makes the crossing an attraction in its own right
» Provides an experience for users, helping to draw more people toward the bridge
» Draws attention to Eagle River and Molinari developments
» Perpendicular orientation of the span over the road can be used for artistic signage
» Pedestrian connections in four different areas give users more choice for an efficient path
» Shallow ramps and gentle curves are safe and easy for pedestrians and bicyclists to navigate

Disadvantages

» Slightly less effective in creating buffered public space
» Artistic form requires additional design, engineering, and construction effort
» Results in significant visual obstruction from the highway to Eagle River

Concept B		
	North Side	South Side
Pedestrian and Bike		
Number of stairs	▲	▲
Span length	▲	
Ramp length	▲	▲
Maximum ramp grade	●	
Smallest turn radius on ramp (for bicycle traffic)	▲	
North/south footprint areas	▲	▲
Total footprint area	▲	
Quality of user experience	●	
Required hours of artificial lighting	●	
Vehicular Disturbance		
Distance from span to closest half CFI overhead signage	●	
Construction disruption duration/severity	▲	
Landscape and Buffering		
Potential for protected public space	●	
Total square footage of landscaped area within structure/public space	●	
Provision of a partial vertical buffer along Molinari development	●	
Aesthetic		
Potential for public art	●	
Potential for designed city signage/branding	●	
Visual obstruction to developments	⬢	▲
Feasibility		
Basic structure cost	●	
Constructibility	●	
Maintenance requirements	▲	
Dewatering needs	●	
Effects on utility relocation	●	
Interference with planned half CFI	●	

● Good Performance

▲ Moderate Performance

⬢ Poor Performance

Two or more concepts both performing at the same level (poor, moderate, or best) are shown with the same icon.

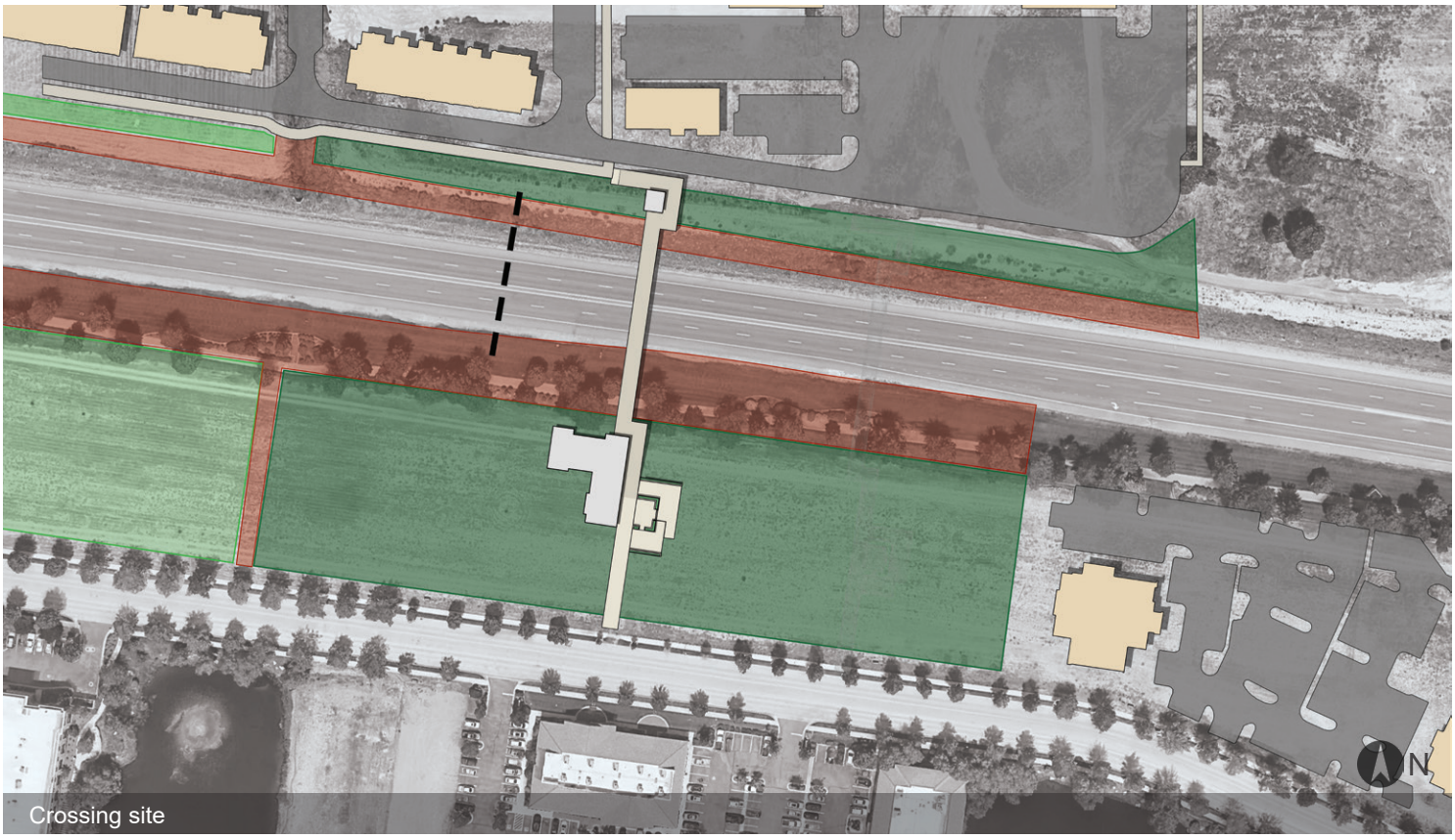
Concept C – Overpass with Elevators

This third concept shows a building-attached overpass which includes stairs and enclosed elevators to achieve the required clearance elevation. This space-efficient design eliminates the need for ramps and is highly effective when considering the high clearance required for the crossing. The concept could either include a building-attached elevator or two free-standing elevators, depending on a developer's preference. While locating the elevator within the building draws in pedestrians and keeps elevator mechanisms better weather-protected, this would likely incur higher design and engineering costs.

Concept C | Bird's Eye View Facing East

Proposed structures shown for Molinari Park and Eagle River are approximations only. These graphics are used to show the crossing in a more accurate future context.

View of overpass from Highway 44



Crossing site

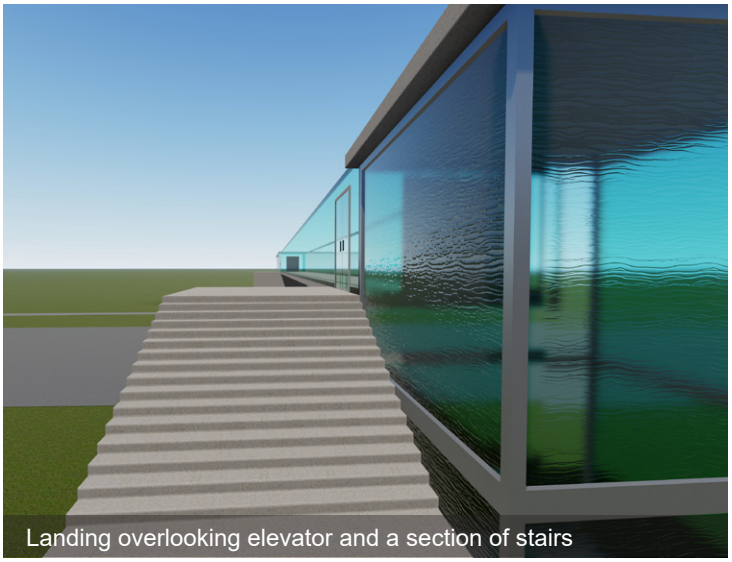
Possible overpass siting area

Possible underpass siting area

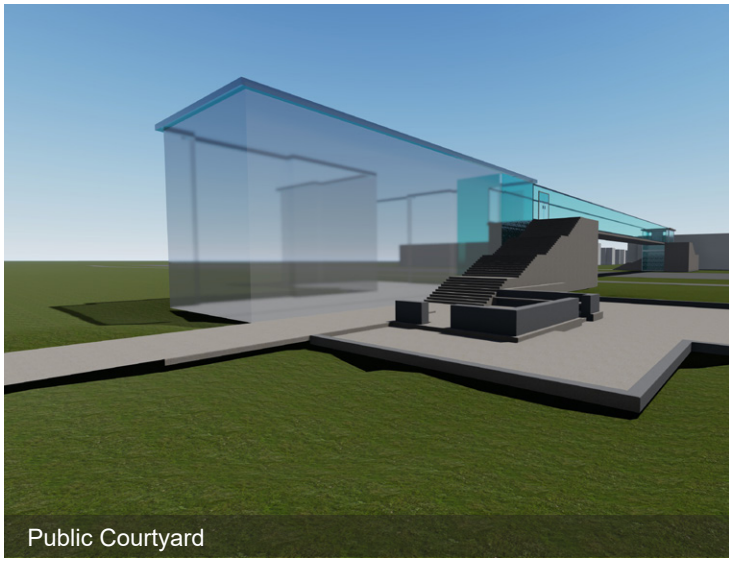
Utility zone

Westernmost location for overpass span

	Square Feet	Acres
Total Footprint Area	3,700	0.08
North Footprint	2,050	0.05
South Footprint	1,650	0.04



Landing overlooking elevator and a section of stairs



Public Courtyard

Advantages

» Elevators, rather than ramps, result in the smallest footprint of any concept
» Elevators are easy for all users to operate, and convenient for pedestrians
» Stairs can be fitted with bike runnels (see appendices) for bicycle accessibility
» Direct pathway through the developments can be flanked with buildings or public space

Disadvantages

» Will require heavy involvement with Eagle River and future owners of the attached building
» Will require extensive engineering and maintenance
» Any elevator outages temporarily remove all ADA access
» Security issues and night access may diminish or eliminate ADA accessibility during some hours

Concept C Performance		
	North Side	South Side
Pedestrian and Bike		
Number of stairs	▲	▲
Span length	▲	
Ramp length	N/A	N/A
Maximum ramp grade	N/A	
Smallest turn radius on ramp (for bicycle traffic)	●	
North/south footprint areas	●	●
Total footprint area	●	
Quality of user experience	▲	
Required hours of artificial lighting	●	
Vehicular Disturbance		
Distance from span to closest half CFI overhead signage	●	
Construction disruption duration/severity	●	
Landscape and Buffering		
Potential for protected public space	▲	
Total square footage of landscaped area/public space	●	
Provision of a partial vertical buffer along Molinari development	⬢	
Aesthetic		
Potential for public art	▲	
Potential for designed city signage/branding	●	
Visual obstruction to developments	●	●
Feasibility		
Basic structure cost	▲	
Constructibility	●	
Maintenance requirements	⬢	
Dewatering Needs	●	
Effects on utility relocation	●	
Interference with planned half CFI	●	

● Good Performance

▲ Moderate Performance

⬢ Poor Performance

Two or more concepts both performing at the same level (poor, moderate, or best) are shown with the same icon.

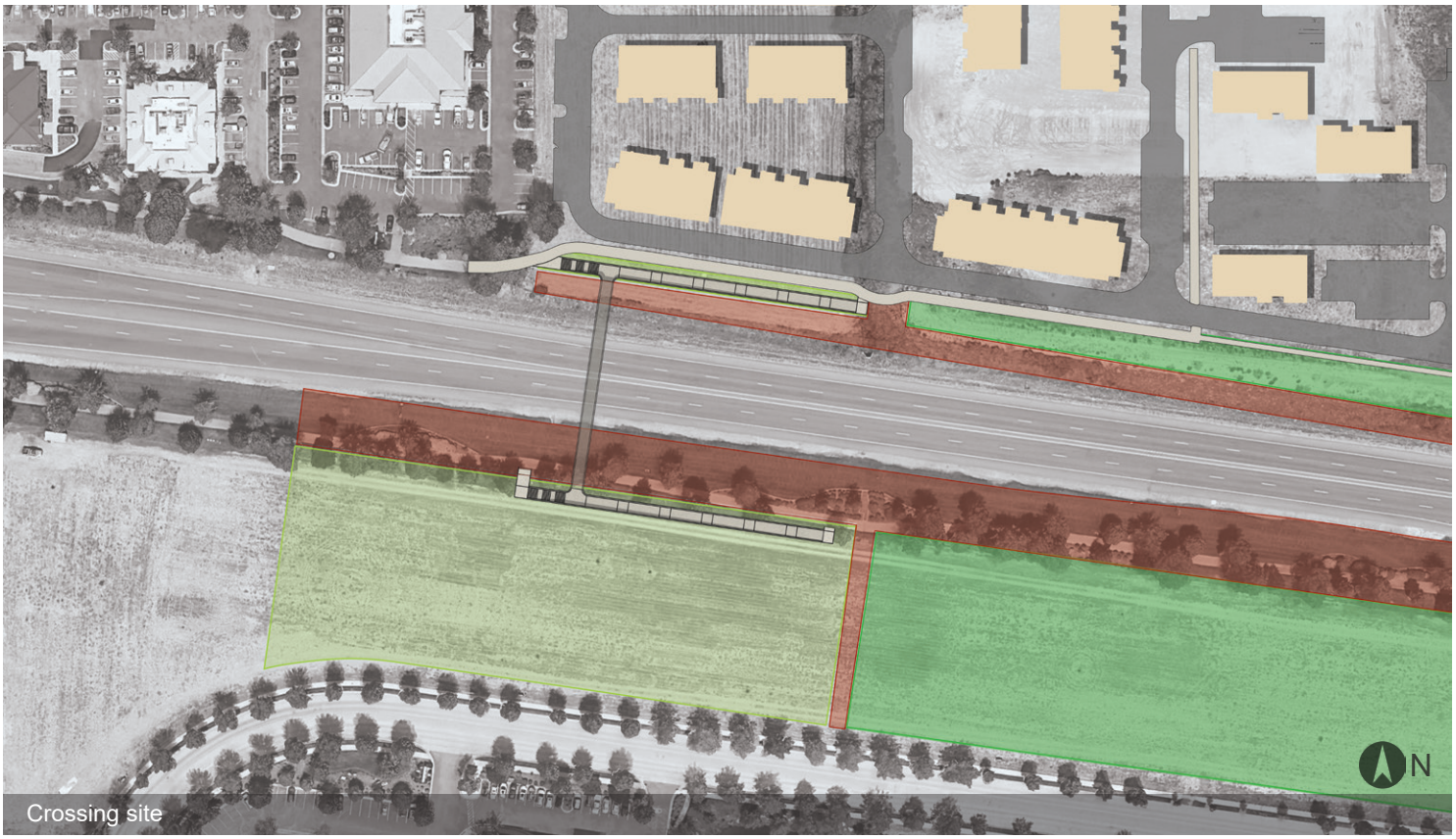
Concept D – Underpass

On this site, an underpass would encounter a number of challenges in order to be effective for users. While the unobtrusive visual form blends with existing features and would not cause visual obstructions, the underpass would require the relocation of a number of utilities. Additional engineering and dewatering would also be necessary to ensure the crossing's usefulness. This style of crossing would include ample space for public art, though that space would not be visible from outside the crossing, and also requires a lesser grade change, resulting in shorter ramps.

Concept D | Bird's Eye View Facing East

Proposed structures shown for Molinari Park and Eagle River are approximations only. These graphics are used to show the crossing in a more accurate future context.

View of underpass from Highway 44



Crossing site

Possible overpass siting area

Possible underpass siting area

Utility zone

	Square Feet	Acres
Total Footprint Area	6,900	0.16
North Footprint	3,450	0.08
South Footprint	3,450	0.08

Advantages

» Opportunities for public artwork
» Causes no visual disruption at grade
» May be shallower, resulting in shorter ramps

Disadvantages

» Limited potential for public space without extensive excavation
» Will require careful engineering and construction to avoid reintroducing flooding issues which were mitigated by burying the Ballantyne Canal
» Will require additional engineering to mitigate the high water table and reduce water infiltration into the structure
» Tunnel may feel uncomfortable or claustrophobic to users
» Integration of natural light, artificial light, and public artwork to make the space comfortable will be costly
» Will necessitate that all local utilities except the Ballantyne Canal be relocated
» Extensive traffic disruption during construction
» May introduce a fall hazard into the ramp/stair trench
» Strong potential for graffiti and vandalism

Potential for Public Art

Ramp and Stairwell toward Underpass Span

Concept D Performance		
	North Side	South Side
Pedestrian and Bike		
Number of stairs		
Span length		
Ramp length		
Maximum ramp grade		
Smallest turn radius on ramp (for bicycle traffic)		
North/south footprint areas		
Total footprint area		
Quality of user experience*		
Required hours of artificial lighting		
Vehicular Disturbance		
Distance from span to closest half CFI overhead signage		
Construction disruption duration/severity		
Landscape and Buffering		
Potential for protected public space		
Total square footage of landscaped area/public space		
Provision of a partial vertical buffer along Molinari development		
Aesthetic		
Potential for public art		
Potential for designed city signage/branding		
Visual obstruction to developments		
Feasibility		
Basic structure cost		
Constructibility		
Maintenance requirements		
Dewatering Needs		
Effects on utility relocation		
Interference with planned half CFI		

 Good Performance

 Moderate Performance

 Poor Performance

Two or more concepts both performing at the same level (poor, moderate, or best) are shown with the same icon.

Selection Process for Preferred Concept

Selection Process

Selecting a preferred concept from among all developed concepts considered three factors: concept performance, working group input, and user experience.

» Concept Performance. The performance as tabulated in the comparison chart at the right was considered as a metric of each concept's effectiveness in meeting the project goals to improve pedestrian access and safety.

» Working Group Input. The working group appointed by COMPASS and the City of Eagle provided reactions to each concept and helped identify local preferences.

» User Experience. The user experience for each concept was weighed, acknowledging this is a subjective measure. Well-lit, artistic solutions with higher user comfort were ranked more favorably than concepts lacking these features or those requiring greater maintenance.

Preferred Concept

The selection process determined that an overpass will encounter fewer challenges than an underpass. An underpass is not recommended due to construction challenges, higher costs for both construction and maintenance, fewer opportunities for public space or artwork amenities, and the user safety and discomfort issues that could stem from its steep ramps and sharp turn radii.

While all overpass options outperform the underpass, one concept performs particularly well in the comparison chart: Concept C, an overpass with elevators.

» This solution's small footprint allows the greatest flexibility within the identified siting area, though it would presumably perform best at the identified location connecting to Molinari Park's north-south pedestrian corridor.

» Because the concept does not use ramps, it doesn't create barriers between proposed developments and the highway.

» The concept's major drawback is the loss of ADA accessibility that would occur in the event of an elevator breakdown. Proper design, construction, and ongoing maintenance should minimize the occurrence of such an event.

Although Concept C is preferred overall, there are important considerations to be kept in mind:

» Higher maintenance costs should not be overlooked, as these costs will be a long-term investment for the city.

» Elevators are also somewhat less convenient for cyclists to use. If the majority of users are expected to be by cyclists, this concept may be less ideal.

This evaluation determined that Concept C is the preferred concept. This preliminary recommendation should continue to be evaluated as additional public input is gathered.




4.01 Concept Performance Comparison Chart

	Overpass			Underpass
	Concept A	Concept B	Concept C	Concept D
Pedestrian and Bike				
Number of stairs	40	40	40	28
Span length	257 ft	225 ft	212 ft	197 ft
Ramp length	400 ft	400 ft	N/A	225 ft
Maximum ramp grade	5%	5%	N/A	8%
Smallest turn radius on ramp (for bicycle traffic)	13 ft radius	40 ft radius	N/A	5 ft radius
North footprint areas	7,700 sq ft	7,650 sq ft	2,050 sq ft	3,450 sq ft
South footprint area	14,900 sq ft	7,850 sq ft	1,650 sq ft	3,450 sq ft
Total footprint area	22,600 sq ft	15,500 sq ft	3,700 sq ft	6,900 sq ft
Quality of user experience	High	High	Moderate	Moderate to Poor
Required hours of artificial lighting	Night hours only	Night hours only	Most hours; code required	All hours
Vehicular Disturbance				
Distance from span to closest half CFI overhead signage	Approx. 430 ft	Approx. 380 ft	Approx. 425 ft	N/A
Construction disruption duration/severity	Moderate: span layout and placement, road-adjacent ramp/public space construction	Moderate: span layout and placement, road-adjacent ramp/public space construction	Moderate: placement of pre-fab span, road-adjacent construction of building and elevator	Severe: Excavation, culvert placement, sealing, fill, ramp and stairwell construction
Landscape and Buffering				
Potential for protected public space	High	High	Moderate	Low
Total square footage of landscaped area/public space	6,850 sq ft	2,150 sq ft	2,700 sq ft	0 sq ft
Provision of a partial vertical buffer along Molinari development	Along commercial area	Along commercial area	Negligible	None
Aesthetic				
Potential for public art	High: ample vertical surfaces for public art	High: ample vertical surfaces for public art	Moderate: fewer publicly visible surface areas	Moderate: public art and artistic lighting; low visibility
Potential for designed city signage/branding (visibility from road)	Moderate: angled visibility	High: perpendicular visibility	High: perpendicular visibility	N/A: no visibility from road
Visual obstruction to developments on the north	High	High	Low	N/A
Visual obstruction to developments on the south	Moderate	Moderate	Low	N/A
Feasibility				
Constructibility	Good	Good	Good	Poor
Maintenance requirements	Moderate	Moderate	Extremely High	Extremely High
Dewatering Needs	N/A	N/A	N/A	Constant pumping
Effects on utility relocation	No relocation required	No relocation required	No relocation required	All but Ballantyne Canal
Interference with planned half CFI	Low	Low	Low	High; requires drainage structure relocation
Total Performance (sum of high performance marks)	11 Good	12 Good	17 Best	6 Poor

Good Performance Moderate Performance Poor Performance




4.02 Cost Estimate

	Overpass			Underpass
	Concept A	**Concept B**	**Concept C**	**Concept D**
Pedestrian and Bike				
Project scope	Extended ramp system and added public amenities	Standard overpass	Elevators and added building scope	High groundwater, dewatering, temporary shoring, roadway improvements, and utility relocations
Ramp system	3,000,000	2,000,000	-	2,000,000
Stair system	1,200,000	820,000	1,250,000	1,500,000
Bridge span or subterranean span	1,750,000	700,000	2,000,000	700,000
Public amenity/landscape features	1,000,000	1,500,000	1,000,000	4,500,000
Structure and elevator system	-	-	3,500,000	-
Design fee (8-10%)	800,000	600,000	1,056,000	1,000,000
Land acquisition cost	350,000	250,000	300,000	300,000
Subtotal	**8,100,000**	**5,870,000**	**9,106,000**	**10,000,000**
Contingency (30%)	2,430,000	1,761,000	2,881,800	3,000,000
Projected project cost	**10,530,000**	**7,631,000**	**11,837,800**	**13,000,000**

Summary of Cost Estimate

The above cost estimates are relevant for the architectural structure of an over- or undercrossing. Costs are based on comparable case study price modeling, and are broken down by basic structure component (i.e. ramp system, land acquisition cost, etc.).

4.03 Cost Precedents

	Name	Location	Overall Cost	Year Completed	Average Cost Per Linear Foot
Overpass	Vancouver Land Bridge	Vancouver, WA	$12,250,000.00	2008	$10,054.68
	University District Gateway Bridge	Spokane, WA	$13,200,000.00	2019	
	Atlanta Braves Bridge Project	Atlanta, GA	$21,000,000.00	2017	
	Papillion Pedestrian Bridge	Papillion, NE	$1,800,000.00	2018	
	Apogee Stadium Pedestrian Bridge	Denton, TX	$2,500,000.00	2018	
Overpass and Elevator	Lafayette Pedestrian Bridge	Portland OR	$3,900,000.00	2018	$24,736.08
	Amgen Helix Pedestrian Bridge	Seattle, WA	$10,000,000.00	2004	
	Gibbs Street Pedestrian Bridge	Portland, OR	$13,000,000.00	2012	
	Connecticut River Walk	Springfield, MA	$4,500,000.00	2002	
	Foley Pedestrian Bridge	Foley, FL	$6,300,000.00	2016	
	Mercer Drive Pedestrian Bridge	Atlanta, GA	$2,900,000.00	2017	
Underpass	Euclid to 18th Transportation Improvement	Boulder, CO	$7,400,000.00	2012	$27,595.51
	Basalt Avenue Pedestrian Underpass	Basalt, CO	$6,200,000.00	2017	
	4th Street Southwest Underpass	Calgary, Alberta, Canada	$6,700,000.00	2019	
	Woy Woy Pedestrian Underpass	New South Wales, Australia	$4,800,000.00	2015	
	The East Campbell Avenue Portals	Campbell, CA	$4,850,000.00	2016	
	Baseline Road Underpass	Boulder, CO	$5,400,000.00	2016	

05 Appendices

Enclosure Styles

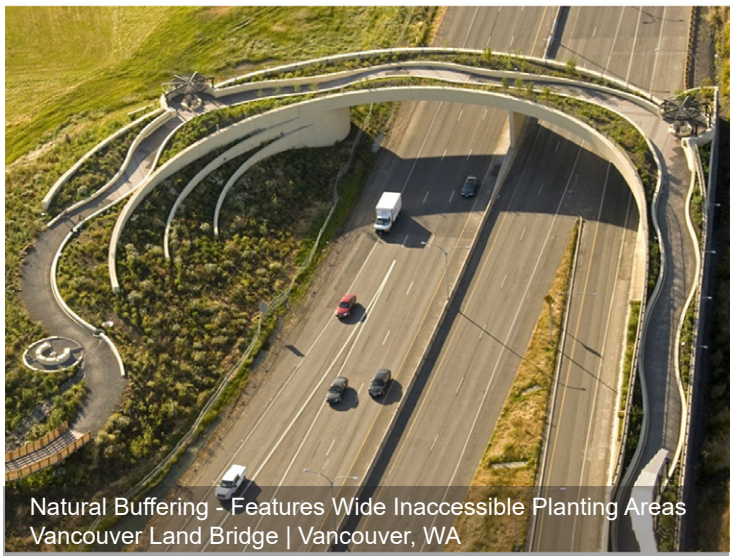
Full Enclosure

Rustic Traditional Style
Pedestrian Bridge | Winston-Salem, NC

Full Enclosure

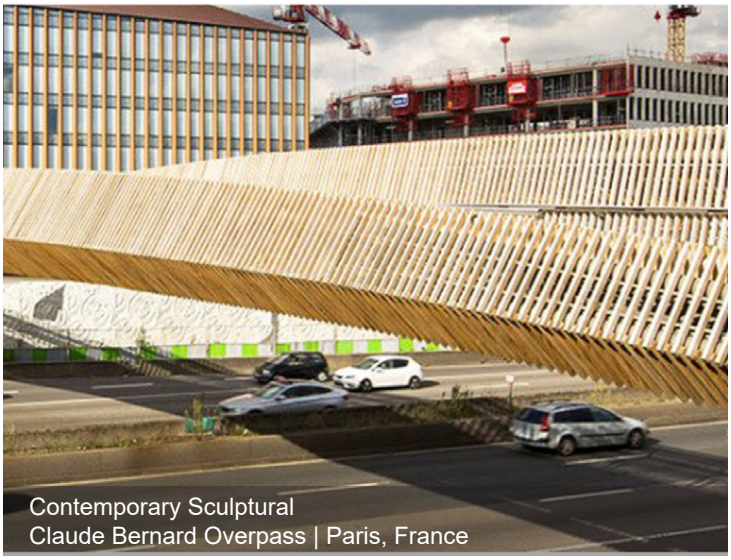
Contemporary Industrial
38th and Blake Pedestrian Bridge | Denver, CO

Horizontal Pedestrian Buffer



Natural Buffering - Features Wide Inaccessible Planting Areas
Vancouver Land Bridge | Vancouver, WA

Partial Enclosure



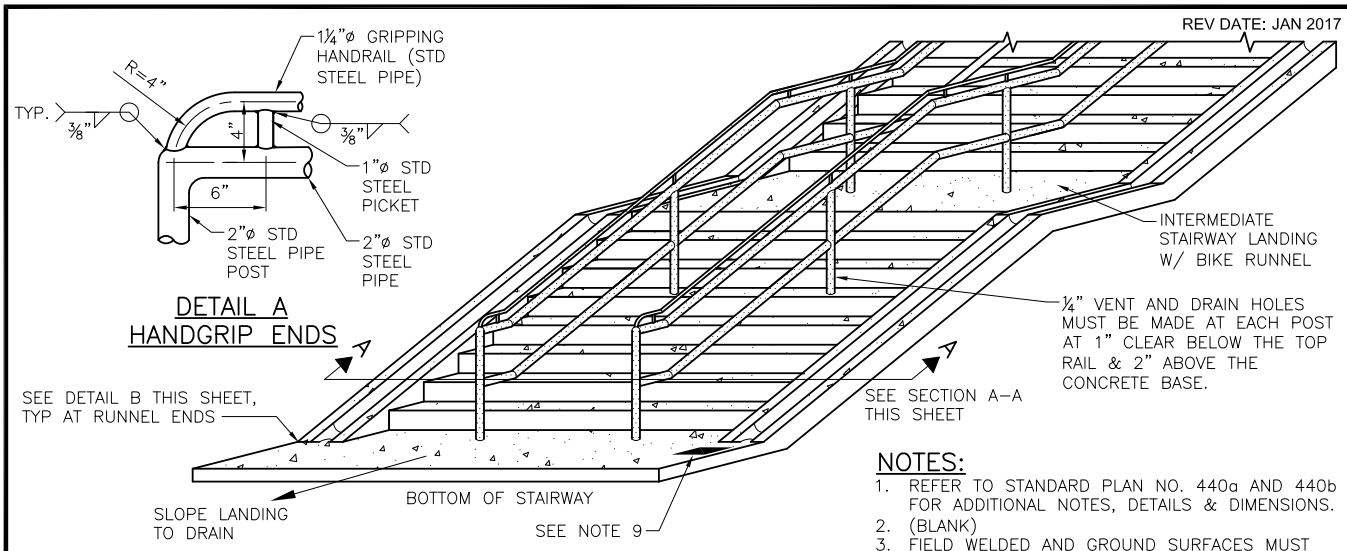
Contemporary Sculptural
Claude Bernard Overpass | Paris, France

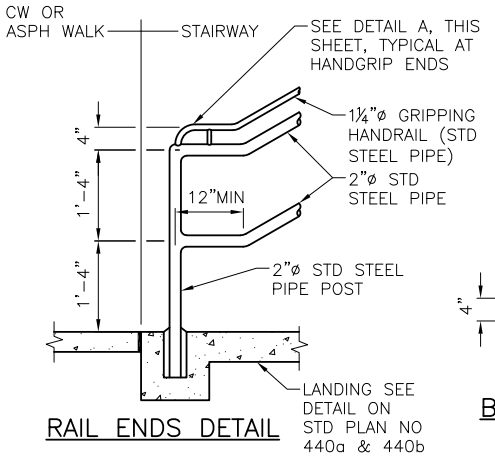
While only basic crossing structures are provided in the preceeding pages, a variety of design styles could be applied based on public preference or determination by cost.

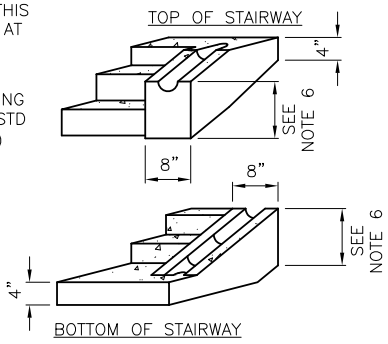
Bike Runnel Detail

400 STREET PAVING & APPURTENANCES — STANDARD PLAN NO **440c**

REV DATE: JAN 2017

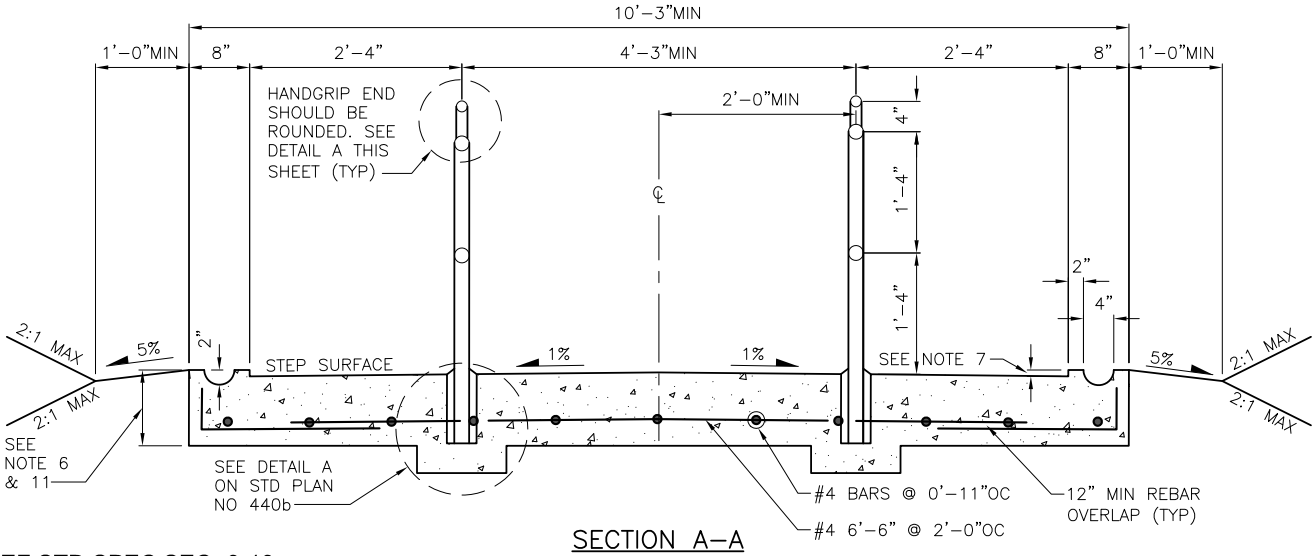






NOTES:

1. REFER TO STANDARD PLAN NO. 440a AND 440b FOR ADDITIONAL NOTES, DETAILS & DIMENSIONS.
2. (BLANK)
3. FIELD WELDED AND GROUND SURFACES MUST BE CLEANED AND COATED WITH ZINC SPRAY TO A MIN. OF 3 MILS, DRY PAINT THICKNESS.
4. DIMENSIONS SHOWN ON ONE SIDE OF THE SECTION VIEW ARE TYPICAL TO THE OTHER SIDE, UNLESS NOTED OTHERWISE.
5. DISTANCE BETWEEN HANDGRIP SUPPORTS MUST NOT EXCEED 6'–0".
6. BIKE RUNNEL SLAB THICKNESS VARIES WITH STEP RISER HEIGHT. MIN. 10.5", MAX. 12.5"
7. RUNNEL LIP HEIGHT 1.5" ABOVE STEP NOSING AND LANDING.
8. INTERMEDIATE STAIR LANDINGS THAT INTERSECT OTHER STAIRS OR WALKS MUST BE AT LEAST 6' LONG TO ALLOW FOR A MIN. 4' OF CLEAR AREA WITHOUT RUNNEL & RAIL.
9. STAMP CONCRETE AT TOP AND BOTTOM OF RUNNEL. SEE CONCRETE STAMP DETAIL STD PLAN NO 440d.
10. LONG STAIRWAYS OR STAIRWAYS WITH SIGHT OBSTRUCTIONS TO CYCLISTS MUST HAVE SIDEWALK BREAKS TO ALLOW ONCOMING CYCLISTS PASSAGE. LOCATIONS OF SIDEWALK BREAKS TO BE DETERMINED BY ENGINEER.
11. ANY CONSTRUCTION OUTSIDE OF RUNNEL MUST ALLOW ENOUGH CLEARANCE FOR BIKE PEDALS AND HANDLEBARS FROM INTERFERING WITH MOVEMENT.



REF STD SPEC SEC 8-18

City of Seattle	NOT TO SCALE	CEMENT CONCRETE STAIRWAY & BIKE RUNNEL

2017 Edition City of Seattle Standard Plans for Municipal Construction

ITD Confirmation for Minimum Distance from Half CFI

Reply Reply All Forward

RH

Regan Hansen <Regan.Hansen@itd.idaho.gov> | Elaine Zabriskie; Doug Russell; Chad Lorentzen | 1 | Wed 7/24

RE: [EXTERNAL] SH 44 Pedestrian Crossing and Half CFI

You replied to this message on 7/24/2019 3:39 PM.

Minimum Sign Distance.xlsx
13 KB

From: Regan Hansen <Regan.Hansen@itd.idaho.gov>
Sent: Wednesday, July 24, 2019 11:52 AM
To: Elaine Zabriskie <elaine@thelandgroupinc.com>
Cc: Doug Russell <doug@thelandgroupinc.com>; Chad Lorentzen <clorentzen@thelandgroupinc.com>
Subject: RE: [EXTERNAL] SH 44 Pedestrian Crossing and Half CFI

Hi Elaine,

Per our phone conversation, here is written confirmation of the following:

- The minimum vertical clearance for structures over Idaho state highways is 17 feet per the ITD Design Manual section 1020.07. We prefer to use a minimum height of 17'6" to allow for future overlays (17'6" is the clearance of the overhead sign structures that will be installed with the CFI). Please let us know if you found conflicting guidance in an ITD publication.
- The proposed locations of the pedestrian bridge, which are at a minimum distance of > 300' upstream of the overhead sign structure, are acceptable. ITD does not have any published guidance for this spacing. A spacing of > 300' would result in a visible distance of > 650' (based on design sign height of 25.5', pedestrian bridge clearance of 17.5', and eye height of 7.5'). At the posted speed of 55mph, this would provide > 8 seconds for drivers to perceive and react to the guide signs; this includes > 3 seconds of full sign visibility before the sign would be legible (based on MUTCD assumption of 30' of legibility distance per 1" of letter height).
- If an underground crossing structure is installed west of the overhead sign structure then it will reduce the area of the infiltration bed for the drainage system that will be installed on the SE quadrant of the intersection. This decrease in infiltration capacity would need to be mitigated. There is additional room on ITD R-O-W to widen the infiltration beds so that the overall area is unchanged. The intent of the infiltration bed design was to minimize impacts to the adjacent landowner and to the existing landscaping, but it does leave some room for widening to preserve the lost capacity that would result from reducing the length of the infiltration bed.

Please let me know if you have any additional questions.

Thank you!

Regan Hansen
Design/Construction EIT, District 3
Idaho Transportation Department
Desk: 208-332-7170 | Mobile: 208-801-3511

YOUR *Safety* • • • ▶ YOUR *Mobility* • • • ▶ YOUR *Economic Opportunity*

Reply Reply All Forward

RH

Regan Hansen <Regan.Hansen@itd.idaho.gov> | Elaine Zabriskie; Doug Russell; Chad Lorentzen | 1 | Wed 7/24

RE: [EXTERNAL] SH 44 Pedestrian Crossing and Half CFI

You replied to this message on 7/24/2019 3:39 PM.

Minimum Sign Distance.xlsx
13 KB

Please see attached for a simple worksheet to calculate minimum distance if any conditions change, but 17' of clearance still gives > 3 seconds of perception reaction time so it is not an issue with respect to the minimum 300' distance (as mentioned, we do *prefer* a minimum height of 17'6" if feasible to provide for the desired clearance even with future changes such as overlays).

Thank you,

Regan Hansen
Design/Construction EIT, District 3
Idaho Transportation Department
Desk: 208-332-7170 | Mobile: 208-801-3511

YOUR *Safety* • • • ▶ YOUR *Mobility* • • • ▶ YOUR *Economic Opportunity*

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