# **SH-44 Grade Separated Crossing**

Pre-Concept Report September 2022







BURGESS & NIPLE
Engineers - Architects - Planners

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# 1.0 Project Summary

The purpose of this study is to further investigate the feasibility of a grade separated pedestrian crossing of SH-44 between the Molinari Development and the Eagle River Business Park, in Eagle Idaho. The findings from a previous study of a crossing in the corridor were used to inform the selected alternatives for this study. The goal of this study is to determine if a crossing is feasible and desired and if so, what the recommended crossing type will be.

Two bridge alternatives and two undercrossing alternatives were evaluated. Alternatives were evaluated based on costs, right-of-way impacts, utility impacts, floodplain impacts, and view shed impacts. These alternatives were presented to the project stakeholder group which included area business owners, representatives for Molinari and Eagle River, and public agency representatives. The alternatives were then reduced to two alternatives: one bridge and one undercrossing, which were then presented to the public.

Based on alternative analysis, public comment and stakeholder feedback, it was determined that a grade separated crossing is desired by the public with an undercrossing being the preferred crossing style. However, based on feedback and site constraints, it was determined that the location of the crossing was not feasible. It is the recommendation of this study to no longer pursue a crossing at this location due to cost, floodplain impact, and right-of-way (R/W) impacts.

As an outcome of this study, it is recommended that the City investigate an undercrossing at the intersection of Edgewood Lane and SH-44 which will have no floodplain impacts and limited to no R/W impacts. It is also recommended that the City coordinate with the Idaho Transportation Department (ITD) to investigate at-grade crossing improvements at the intersection of SH-44 and Eagle Road to improve pedestrian safety and comfortability.

# 2.0 Project Description

#### 2.1 Purpose and Need Statement

The purpose of this study is to evaluate grade separated pedestrian crossing facilities across SH-44 in Eagle, ID to improve pedestrian safety and connectivity in Eagle and throughout the Treasure Valley. The study area is shown below in **Figure 1.** 



Figure 1: Study Area

# 2.1 Project Scope

Burgess and Niple (B&N) was selected to evaluate four grade-separate crossing alternatives of SH-44 at a previously identified crossing location in Eagle, Idaho. Additionally, B&N was tasked with developing a pre-concept report summarizing the study findings and recommendations. The intent of this study is to determine through conceptual engineering analysis, stakeholder coordination, and public outreach if a grade-separate crossing is desired and feasible at the location identified in the original study conducted by The Land Group. The original study is located in **Appendix A.** If the crossing is determined to be desired and feasible, a recommended alternative based on public and stakeholder comment will be detailed in the report.

### 2.2 Assumptions and Design Criteria

It is assumed that the information related to existing site conditions, the environmental scan, existing utilities, existing safety concerns, the floodplain, and existing bike and pedestrian infrastructure detailing in the Land Group study is still accurate and applicable to the study.

The design criteria used for this study and its source is detailed in **Table 1** below:

Table 1: Project Design Criteria

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CRITERIA	DIMENSION	REFERENCE					
Design / Posted Speed	55 mph (SH-44)	Posted speed limit signs in field					
Multi Use Path	Minimum 8', Maximum 10' On Bridge – 14' In Undercrossing – 14'	AASHTO Guide for the Development of Bicycle Facilities, Fourth Ed. Section 5.2					
Sidewalk Widths	5', minimum 4'	Public Rights-of-Way Accessibility Guidelines (PROWAG), Section R302.6.1, Advisory R302.6.1					
ADA Compliant Longitudinal Slopes	5% maximum longitudinal slope 8% slopes allowable for 35' lengths with 2% landings	Public Rights-of-Way Accessibility Guidelines (PROWAG), Section R302.6.1, Advisory R302.6.1					
Vertical Clearance Under Bridge	17'-0"	Idaho LRFD BDM Section 2.3.3.2					
Bridge Width	10'-0" minimum	AASHTO LRFD Bridge Design - Span Ratios					
Minimum Horizontal Clearance from Bridge to Roadway	32'-0" maximum	Idaho RDM Section 565.00 and Fig. 5-7					
Undercrossing Height	10'-0"	AASHTO Guide for the Development of Bicycle Facilities, Fourth Ed. Section 5.2					
Undercrossing Width	14'-0"	AASHTO Guide for the Development of Bicycle Facilities, Fourth Ed. Section 5.2					
Undercrossing Minimum Cover	3'-0"	Oregon Bicycle and Pedestrian Design Guide Section 7 Fig. 7-18					

### 2.3 Existing Conditions

A detailed summary of the site's existing conditions can be found in the Land Group Study in **Appendix A**. There are several existing conditions to highlight that are important to this secondary study including the floodplain, existing utilities, planned developments, and the status of SH-44 construction.

In regard to the floodplain, the south side of the crossing is in the 100-year floodplain. The Molinari development (north of the crossing) has worked for the past several years with FEMA to get their development out of the 100-year floodplain through a Letter Of Map Revision, or LOMR. Additionally, ground water is high (7' below ground surface) at the project location, and fluctuates seasonally, sometimes within a few feet of the surface elevation.

There are numerous existing utilities in the SH-44 corridor that the project could impact. Water, sewer, irrigation, fiber optic, and storm drainage are all located in the corridor and will need to be relocated if impacted by the crossing.

When the original study was conducted Molinari was still a planned development. Since then, Molinari has broken ground and has begun construction. Because of this, the crossing location was limited to an area adjacent to a proposed parking lot to limit site impacts. The Eagle River development to the south has developed several other parcels since their original study resulting in one available parcel for the crossing to impact.

Lastly, in the original study, a half continuous flow intersection (CFI) was planned for the intersection of Eagle Road and SH-44. The CFI was not constructed and instead, SH-44 was widened to add additional turn lanes and through lanes to improve the intersection's capacity. The original concerns about impacting sight distance to the cross over signal is no longer a concern. The new intersection however has impacted pedestrian safety with longer crossings and no pedestrian refuge islands. The free-flow right turn movements have also been removed but driver conformance with this has been a challenge and has resulted in more frequent pedestrian and vehicle conflicts.

## 2.4 Regional Connections

Besides improving pedestrian safety, one of the goals for this pedestrian crossing is to connect pedestrians and cyclists on the north side of SH-44 to the Greenbelt along the Boise River. The Greenbelt is a regional bike route that runs throughout the Treasure Valley. This connection will provide users with a safe, but not direct connection to the regional route. Users will still need to navigate local roadways in the Molinari and Eagle River Developments to get from other major trails and pathways to the Greenbelt. A summary of existing bike and pedestrian infrastructure in the Eagle area can be found in **Appendix A**.

# 3.0 Project Constraints

The alternatives developed for this project were evaluated against several project constraints including: impacts to adjacent businesses, impacts to the Boise River floodplain, view shed impacts, utility impacts, and impacts to SH-44. The evaluation criteria for this project were developed with the project Stakeholders' input.

#### Impact to Adjacent Businesses

The SH-44 corridor is a highly developed corridor with many existing Class A office spaces and even more planned for the future. The stakeholders have concerns that a bridge structure could be seen as an eyesore and negatively impact the ability to lease these highly desirable office spaces.

#### Impacts to the Boise River Floodplain

As stated earlier in the Existing Conditions section, the south half of the project (Eagle River Development) is located in the 100-year floodplain. North of SH-44 the Molinari development has expended significant time and cost working with FEMA to get a LOMR to remove their development from the 100-year floodplain. The introduction of an undercrossing alternative could potentially reconnect their development to the 100-year floodplain. To ensure that the floodplain is not reconnected, a dike or floodwall would need to be constructed around either or both entrances to the undercrossing so that floodwater does not inundate the north side of SH-44. Significant coordination with FEMA during design would be required if an undercrossing alternative was selected to prove the Molinari parcels were not being reconnected to the 100-year floodplain.

### **View Shed Impacts**

A major concern of the project stakeholders was the potential impact to the view of the Boise Foothills from businesses in the corridor if a bridge were constructed. While the structure could be constructed to be aesthetically pleasing and branded with City signage, there was concern that the view of the foothills would be obstructed and that the structure could attract protesters, political or social signage clutter, and general graffiti.

### **Utility Impacts**

A detailed discussion of the existing utilities in the SH-44 corridor can be found in **Appendix A**. Figure 2 below (from the Land Group study) provides a snapshot of the utilities at the proposed crossing location. It is anticipated that a bridge alternative could be placed so the abutments do not impact the utilities. An undercrossing however will impact all utilities. The only way to reduce utility impacts is to place the undercrossing under all the utilities which impacts the right-of-way area needed for ramps down to the undercrossing. A deeper crossing would also result in more ground water pressure and penetration that would need to be continuously pumped out of the undercrossing.

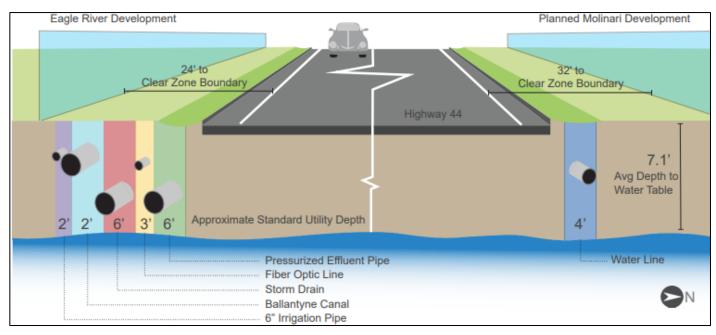


Figure 2: Utilities in SH-44 Corridor (Image Source: Appendix A - Land Group Highway 44 Study)

## Impacts to SH-44

The SH-44 corridor is one of the most heavily traveled roadways in the State. This corridor expereinces over 32,000 average vehicle trips per weekday as provided by COMPASS. The study alternatives were evaluated based on how they impacted the SH-44 corridor. This was primarily reflected in the cost for temporary traffic control since traffic would need to be maintained during construction and general construction costs. The undercrossing alternatives had the most significant impact to SH-44.

#### 4.0 Alternatives

The project team was scoped to evaluate four alternatives for the crossing locations. Two bridge alternatives and two undercrossing options were evaluated. Each alternative is detailed below.

#### Alternative 1 - Prefabricated Steel Truss Bridge

The first alternative evaluated was a prefabricated steel truss bridge. The structure would have a clear span over SH-44 and would be roughly 170' long. The abutments would be placed outside the SH-44 clearzone and outside the limits of all existing utilities and R/W in the SH-44 corridor. In order to limit impacts to SH-44, the structure would be fabricated off site and then would be assembled over limited nighttime closures. This alternative would not require the construction to be staged so that traffic could remain open on SH-44. ADA compliant ramps (approximately 500') in length will be used to access the crossing. In this alternative, the ADA ramp hugged the edges of the parcel line limiting impacts to the parcels and maximizing developable area.

Since this is a bridge option, there are no anticipated impacts to the floodplain, however this alternative is expected to negatively impact the corridor's view shed with the large bridge structure and the long pedestrian ramps. This alternative will have the fastest construction timeline of all alternatives and is expected to have a lower cost than the undercrossing options. This alternative is also expected to have much lower on-going maintenance costs compared to the undercrossing alternatives. **Figure 3 on page 8** depicts this alternative and its impacts.

#### Alternative 2 - Precast Concrete Box Undercrossing

The second alternative evaluated was a precast concrete box undercrossing. The structure would be constructed under SH-44 and would be roughly 200' long. The box would be approximately 14' wide and 10' high. Pumps would be required to continuously pump water out of the passageway due to high ground water at the crossing location. The passageway would also require pedestrian lighting. ADA compliant ramps (approximately 420') in length will be used to access the crossing. In this alternative, the ADA ramp hugged the edges of the parcel line limiting impacts to the parcels and maximizing developable area. A dike or floodwall will also be needed to prevent floodwaters from entering the passageway and flowing to the Molinari development. Staged construction will be required to construct this alternative. Lane closures and capacity reductions on SH-44 will be required to construct the passageway.

Since this is an undercrossing, there are no anticipated impacts to the view shed. However, this alternative is expected to have a much longer construction timeline than the bridge alternatives and is expected to have the highest construction cost. Depending on the depth the passageway is placed, utilities in the SH-44 corridor will need to be relocated which will further drive up the project cost. This alternative is also expected to have significant on-going maintenance costs with the dewatering pumps and constant lighting. **Figure 4 on page 9** depicts this alternative and its impacts.

#### Alternative 3 - Steel Girder Bridge

The third alternative evaluated was a steel girder bridge. Steel girder bridges are typically composed of rolled steel beams or welded plates with a concrete deck. The structure would have a clear span over SH-44 and would be roughly 170' long. The abutments would be placed outside the SH-44 clearzone and outside the limits of all existing utilities in the SH-44 corridor. In order to limit impacts to SH-44, the structure would be fabricated off site and then would be assembled over limited nighttime closures. This alternative would not require the construction to be staged so that traffic could

remain open on SH-44. ADA compliant ramps (approximately 500') in length will be used to access the crossing. In this alternative a different ramp alignment was considered for the southern parcel. This alignment placed the ramps in the middle of the Eagle River parcel. This allowed for an alignment that tied in faster to the existing pathway along SH-44 but limited the development potential for the parcel. In order to limit viewshed impacts and costly retaining walls on the north parcel, the northern ramp alignment assumes that the shared use path in the Molinari development will be constructed with a raised profile, allowing the north ramp to tie in faster.

Since this is a bridge option, there are no anticipated impacts to the floodplain, however this alternative is expected to negatively impact the corridor's view shed with the large bridge structure and the long pedestrian ramps. This alternative will have the second fastest construction timeline of all alternatives and is expected to have a lower cost than the undercrossing options. This alternative is also expected to have much lower on-going maintenance costs compared to the undercrossing alternatives. **Figure 5 on page 10** depicts this alternative and its impacts.

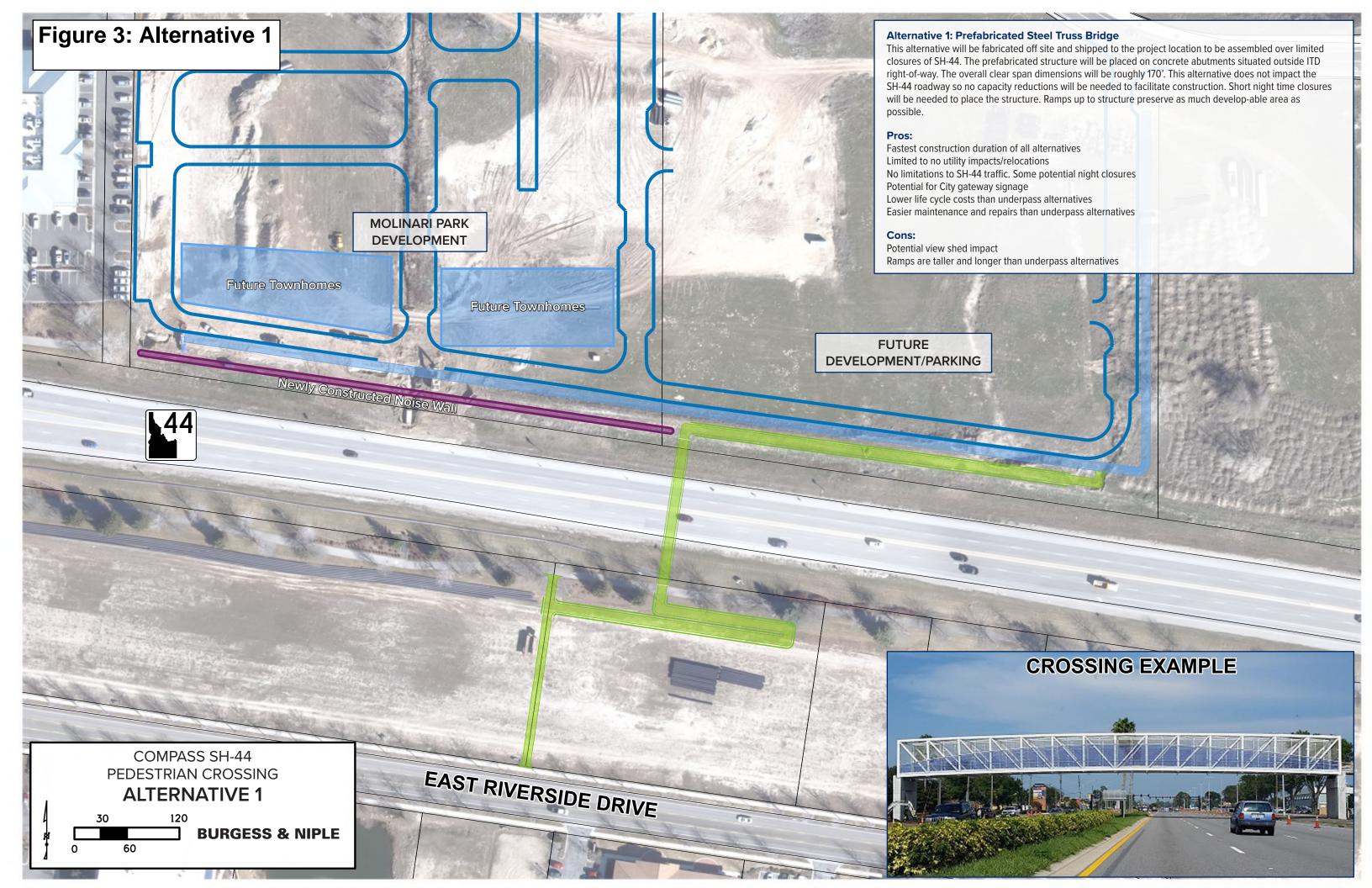
#### Alternative 4 - Corrugated Metal Undercrossing

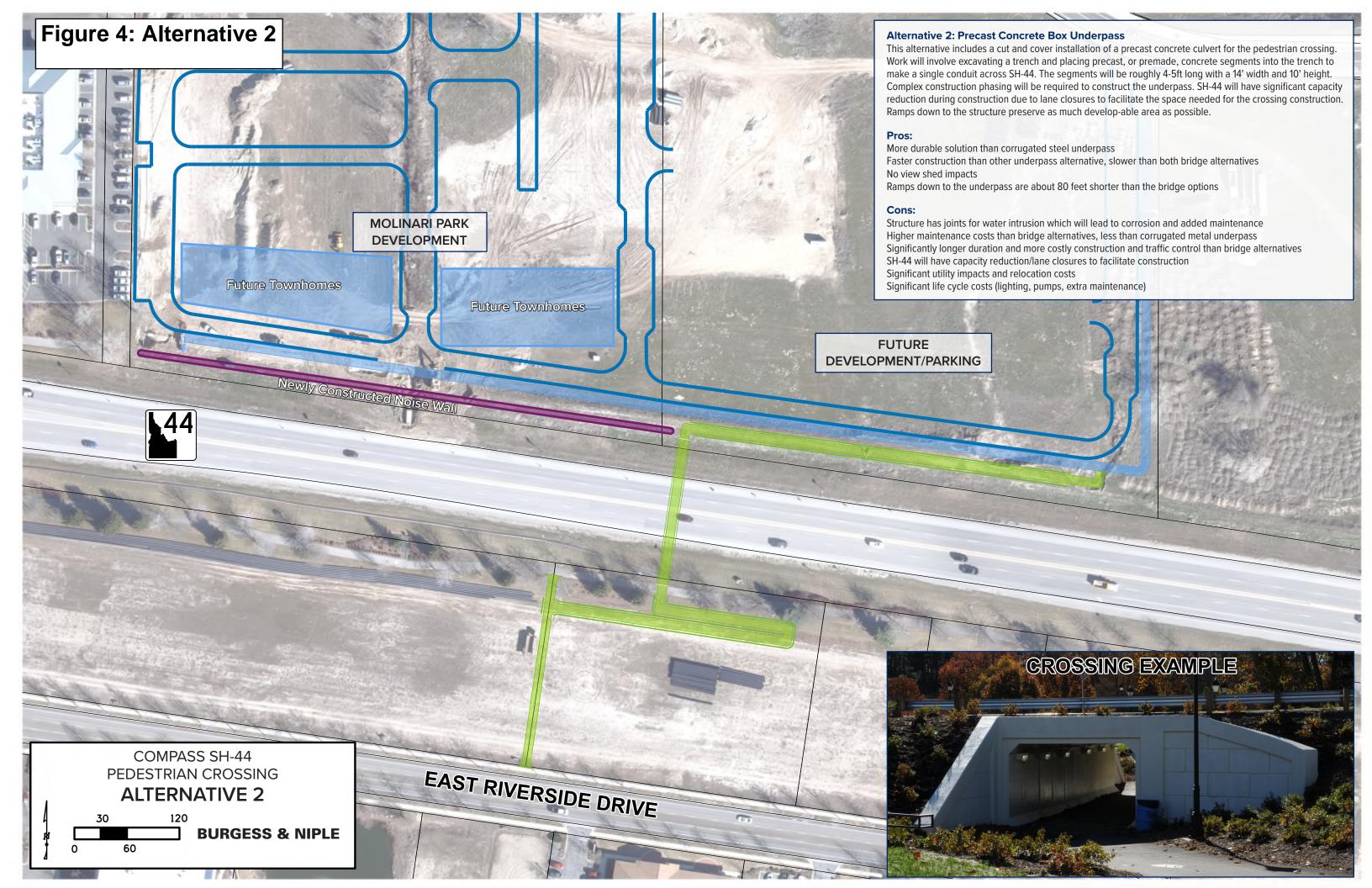
The fourth alternative evaluated was a corrugated metal undercrossing. The structure would be constructed under SH-44 and would be roughly 200' long. The passageway would be constructed onsite by bolting together pieces of preformed metal sheets. This alternative costs less than the precast concrete box but has significant chance for water intrusion and corrosion issues and a need for ongoing maintenance due to all the joints. Pumps would be required to continuously pump water out of the passageway due to high ground water at the crossing location. The passageway would also require pedestrian lighting.

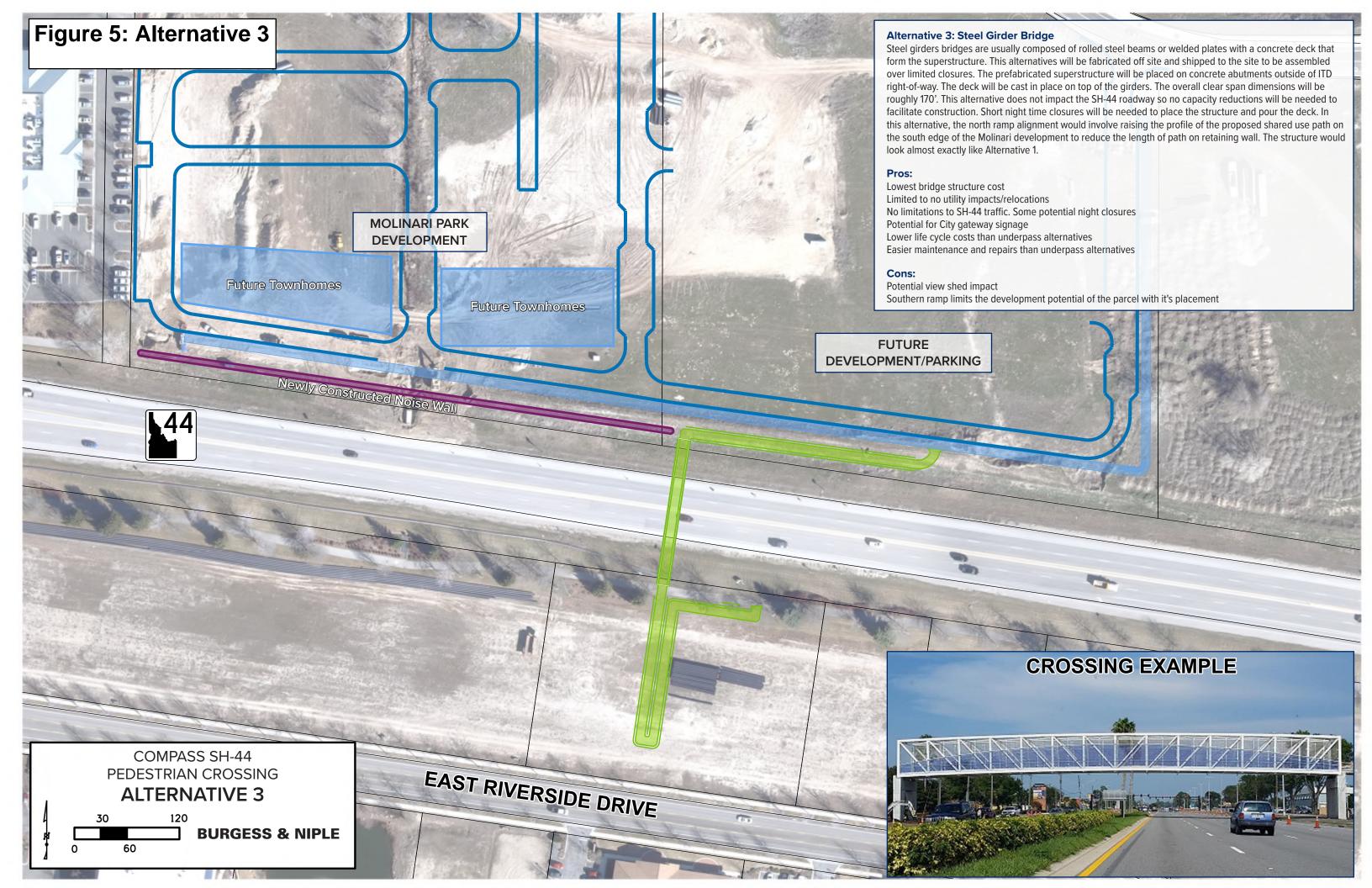
ADA compliant ramps (approximately 420') in length will be used to access the crossing. In this alternative a different ramp alignment was considered for the southern parcel. This alignment placed the ramps in the middle of the Eagle River parcel. This allowed for an alignment that tied in faster to the existing pathway along SH-44 but limited the development potential for the parcel. In order to limit viewshed impacts and costly retaining walls on the north parcel, the northern ramp alignment assumes that the shared use path in the Molinari development will be constructed with a raised profile, allowing the north ramp to tie in faster.

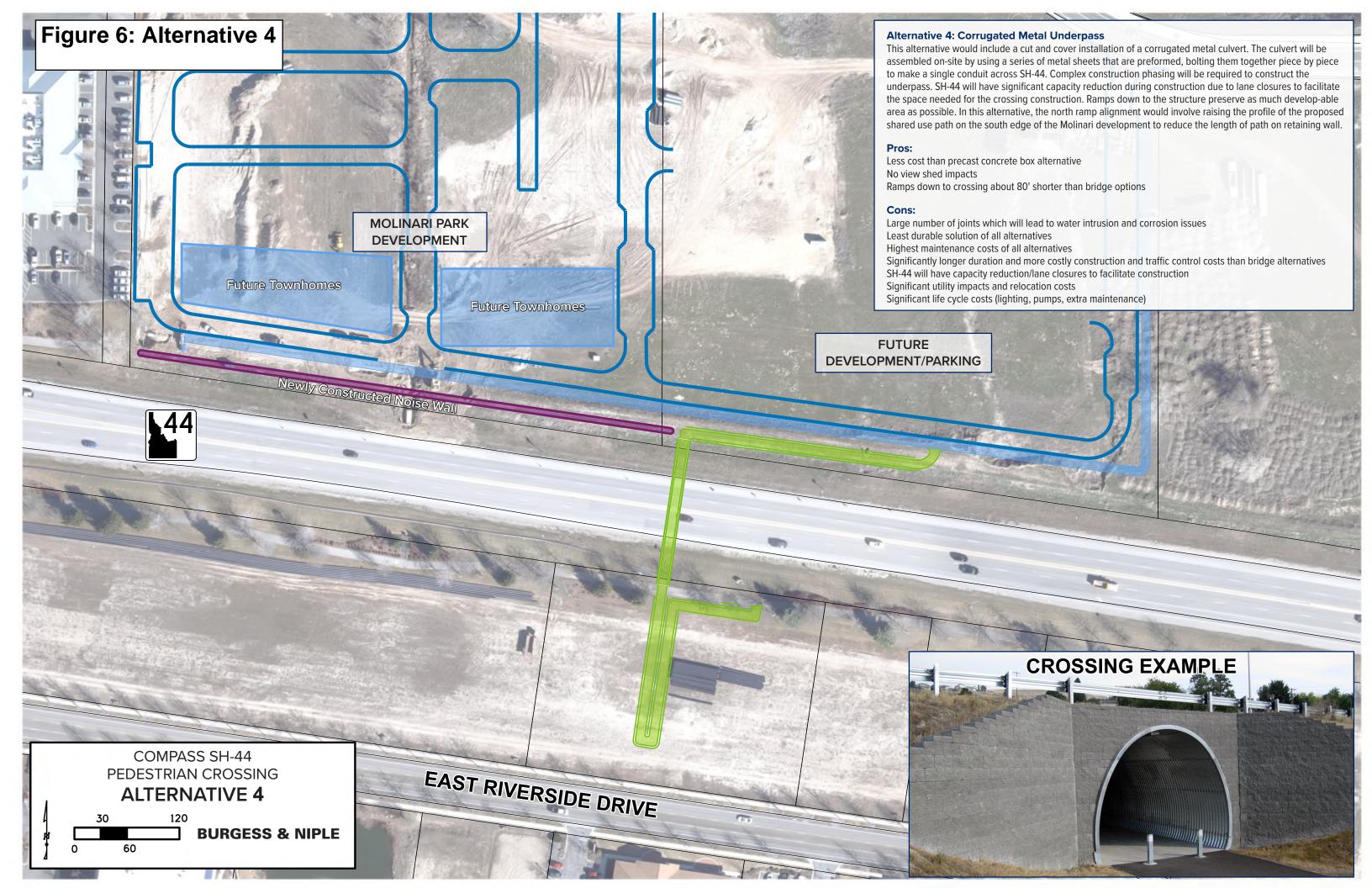
A dike or floodwall will also be needed to prevent floodwaters from entering the passageway and flowing to the Molinari development. Staged construction will be required to construct this alternative. Lane closures and capacity reductions on SH-44 will be required to construct the passageway.

Since this is an undercrossing, there are no anticipated impacts to the view shed. However, this alternative is expected to have a much longer construction timeline than the bridge alternatives and is expected to have the second highest construction cost. Depending on the depth the passageway is placed, utilities in the SH-44 corridor will need to be relocated which will further drive the project cost. This alternative is also expected to have significant on-going maintenance costs with the dewatering pumps and constant lighting. **Figure 6 on page 11** depicts this alternative and its impacts.









#### **Final Alternatives**

The first four alternatives were presented to the Stakeholder group for feedback in order to determine what was presented to the public. After stakeholder review it was determined that prefabricated bridge alternative and the concrete box undercrossing alternative would be presented to the public. Stakeholders had concerns about the right-of-way impacts from the ADA ramps and asked that elevators and stairs also be considered. **Appendix B** shows the final alternatives that were shown to the public for comment.

# 5.0 Right-of-Way Needs

Right-of-way impacts varied based on the access strategy to the crossing facility. ADA compliant access ramps impacted approximately 0.4 acres on the Molinari parcel and 0.46 acres on the Eagle River parcel. Elevator and stair access impacted approximately 0.1 acres on both parcels (0.2 acres total). This included the additional pathways needed to connect the crossing to the existing pedestrian infrastructure. Right-of-way costs were not determined.

# 6.0 Environmental Scan Summary

A detailed summary of the environmental concerns and challenges of this project location can be found in **Appendix A.** The key environmental concern that has been discussed throughout this report is the potential impact to the 100-year floodplain and reconnecting the Molinari development to the 100-year flood plain. Otherwise, there are no wetlands or critical habitats are anticipated to be impacted by the proposed project.

### 7.0 Cost Estimates

Preliminary cost estimates were developed for the two alternatives shown to the public. For the bridge alternative a cost estimate assuming elevator access and an estimate assuming ramp access was developed. Only elevator access was estimated for the undercrossing. A summary of the costs is shown below in **Table 2**. Full cost estimates can be found in **Appendix C**. It should be noted that none of the costs include on-going maintenance costs. The costs shown are just to design and construct each alternative. It should be noted that wile the cost to use ramps to access the bridge is more upfront than elevator access, the elevator access will be significantly more over time due to costly ongoing maintenance and electricity needs.

**Table 2: Summary of Project Costs** 

Alternative	Cost with ADA Ramp Access	Cost with Elevator Access
Bridge	\$6,000,000	\$5,000,000
Undercrossing	N/A	\$10,000,000

# 8.0 Project Stakeholders

The stakeholder group was comprised of area business owners, developers, City staff and local agency partners and are listed in **Table 3**. The stakeholder group vetted all alternatives prior to presenting any alternatives to the public and helped guide the final recommendation for the project. Three stakeholder meetings were held throughout the project and are summarized below.

**Table 3: Project Stakeholders** 

Stakeholder Name	Affiliation		
Nichoel Baird Spencer	City of Eagle		
Mayor Pierce	City of Eagle		
Ryan Head	Ada County Highway District		
Greg McVay	Molenari		
Brook Cole	Molenari		
Tom Ferch	Ada County Highway District		
Tom Bobo	Eagle River		
Chad Hamel	Eagle River		
Mark Wasdahl	Idaho Transportation Department		
Jon Newland	Pet IQ		
Steve Noyes	City of Eagle		
Eric Ziegenfuss	City of Eagle		
Toni Tisdale	COMPASS		
Joey Scheuler	COMPASS		

## **Meeting Number One**

The first stakeholder meeting was held on March 10, 2022. At this meeting the 4 alternatives detailed in section 4 of this report were presented to the stakeholders. Stakeholders provided comments which included adding elevators as an alternative to the ADA compliant pedestrian ramps to access the crossing facilities. The number of alternatives that would be presented at the public involvement meeting were also determined. Only alternatives X and Y would be presented to the public.

# **Meeting Number Two**

Meeting number two was held on May 4<sup>th</sup>, 2022. The alternatives and materials drafted for the public involvement meeting were reviewed.

#### **Meeting Number Three**

The final stakeholder meeting was on August 11, 2022. At this meeting, the group discussed the public comments and made a final recommendation for the project. At this meeting it was determined that the crossing was desired by the public but it was decided that the location studied was not feasible for a crossing due to flood plain impacts, right-of-way impacts, and cost.

#### 9.0 Public Involvement

One in-person public involvement meeting was hosted for this project on June 22, 2022 in conjunction with a month long online public comment period. For both the in-person and online public involvement meetings, the public was asked to provide feedback on if they desired a grade separated crossing or not, and if they did, did they prefer an undercrossing or a bridge. They were also asked to provide feedback on what influenced their decision the most (aesthetics, safety, view shed, or floodplain impact). 444 people participated in the public outreach process. Approximately 64% of respondents were in favor of the City moving forward with the project with the undercrossing being the preferred solution. **Table 4** below summarizes the public feedback. **Appendix D** includes a full report of all public comments.

Table 4: Public Feedback Summary

Altornotivo	Preferred	Factors That Impacted Decision			
Alternative	Alternative	Aesthetics	Safety	View Shed	Floodplain Impacts
No Build	28%	89%	58%	53%	4%
Under Pass	46%	45%	62%	14%	100%
Bridge	26%	73%	52%	52%	37%

# 10.0 Next Steps

Through coordination with the City and the project stakeholders, it was determined that the No-Build alternative is the recommendation for this crossing location. The undercrossing is the preferred crossing alternative but the impacts to the floodplain, costs, and right-of-way impacts have made the alternative unfeasible at the study location. The study team and stakeholders recommend that the City continues to move forward with a crossing, but at a different location. The recommended future crossing location is on the west side of the intersection of Edgewood Lane and SH-44. This location is completely outside of the floodplain and has ample right-of-way to facilitate the crossing. This location also directly ties into Eagle's existing pedestrian and bike path network. It also will provide direct access to a VRT bus stop and a senior citizen community.

In addition to continuing to move the crossing study forward, the study team also recommends that the City continues to work with ITD to implement at-grade crossing improvements at SH-44 and Eagle Road in order to improve pedestrian safety today.