Linder Road, Chinden Blvd (US 20/26) to SH-44
Concept Study

Alternatives Analysis Report
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BOISE, ID
ACHD PROJECT NO.: 518020

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1 INTRODUCTION AND BACKGROUND

The Linder Road Concept Study, from US 20/26 (Chinden Boulevard) to SH-44 (State Street) entails an alignment study for the future widening of this 2.2 mile segment of roadway. Currently Linder Road is mostly a two lane rural section within the project area. However, this roadway is designated as a Residential Mobility Arterial on the Ada County Master Street Map and a principal arterial on COMPASS’ Functional Class Map, which highlights the significance of this corridor as part of the regional transportation system. Linder Road has been designated as a Residential Mobility Arterial from Chinden Blvd to Homer Road, which is approximately a five mile long corridor that serves the developing cities of Eagle and Star as well as the foothills area. With a river crossing, a future I-84 overpass designation, and direct connections to Meridian and Kuna to the south as well as the foothills to the north, Linder Road is a regionally significant roadway that currently plays an important role, and will continue to play an ever increasing role, in the overall transportation system in the valley. As such, the preservation and future improvement of this roadway is critical to maintaining a quality transportation system in Ada County.

The project is located in Meridian, Idaho west of Eagle Road. The project begins at the intersection of Linder Road and Chinden Blvd (US 20/26) and terminates approximately 2 miles north at the intersection of Linder Road and SH-44. Refer to Figure 1 below for a map of the project location.

Figure 1 – Vicinity Map
2 CONCEPTUAL ALIGNMENT ALTERNATIVES EVALUATION

Conceptual alignment alternatives were evaluated to initiate the horizontal and vertical alignment alternatives discussion for the project area as well as the alternatives discussion for the roadway typical section. The analysis performed with this evaluation was largely qualitative, therefore an alternatives matrix was not prepared at this conceptual level of analysis. The alternatives matrix will be presented later in this document for the preferred alignment alternatives to potentially be carried forward to the public information meeting.

Conceptual alignment alternatives were evaluated for two horizontal and four vertical alignment alternatives. The alternatives evaluation assumed that a five-lane roadway section would be implemented initially within this 2.2-mile project area with preservation for an ultimate seven-lane roadway section to be built based on the operational needs of the Linder Road corridor. Horizontal and vertical alignment alternatives were evaluated for the project area assuming both a five lane and seven lane urban and rural roadway section with sidewalks, bike lanes, and/or a multi-use pathway. Alternatives were evaluated for impacts to right-of-way and property owners, water ways, potential wetland areas, structures, irrigation, drainage, pedestrians and bikes, construction staging, and relative construction cost.

Two horizontal alignment alternatives were evaluated for five different roadway sections with three of these alternatives widened from the existing centerline and two of these alternatives widened with a shift from the existing centerline between the Boise River Middle Channel and SH-44. A Linder Road Alternatives Summary, which provides an outline for the alternatives presented, is included in Appendix A.

- **Horizontal Alignment Option 1** - Maintain Existing Centerline (Shown in Alternatives 1, 1B, 2, 3)
- **Horizontal Alignment Option 2** - Shift Centerline 11' East between Boise River Middle Channel and SH-44 (Shown in Alternatives 1A, 4, 5)

Four vertical alignment alternatives were analyzed with varied vertical profiles at the Boise River crossings:

- **Vertical Alignment Option 1** - Increased elevation of all structures with vertical curve in center of Middle and North Channel Boise River Bridges. Provides approximately 2' of freeboard at the Boise River South Channel and North Channel structures with 6” of freeboard at the Middle Channel – 5’-6’ rise from existing grade at the Boise River Middle Channel (shown in Alternatives 1, 1A, 5).
- **Vertical Alignment Option 2** - Increased elevation of all structures with tangents on Middle and North Channel Boise River Bridges. Provides approximately 2' of freeboard at the Boise River South Channel and North Channel structures with 6” of freeboard at the Boise River Middle Channel structure – 4’-5’ rise from existing grade at the Boise River Middle Channel (shown in Alternatives 2, 4).
- **Vertical Alignment Option 3** - Increased elevation of North Channel and South Channel Boise River structures only, allowing the Boise River Middle Channel to overtop similar to the current condition. Option 3 provides approximately 2’ of freeboard at the Boise River South Channel and North Channel structures with no freeboard at the Boise River Middle Channel structure – 1’ rise from existing grade at the Boise River Middle Channel (shown in Alternative 3).
• **Vertical Alignment Option 4** - Increased elevation of all structures with vertical curve in center of the Middle Channel and North Channel Boise River bridges allowing for 2' freeboard at all river crossings to include the Middle Channel – 7'-8' rise from existing grade at the Boise River Middle Channel (shown in Alternative 1B).

There are a number of design factors that are the same for each alternative which are defined below (the elevations for the Boise River channel structures were determined by the most current hydraulic information available during the development of the conceptual alternatives):

• Each alternative evaluated will provide the same traffic operational benefits. The operational analysis for the five lane facility versus a seven lane facility and the year of transition is detailed in the Linder Road, from US 20/26 to SH-44 Traffic Memorandum dated October 12, 2018.

• Bike lanes are currently shown with all options, to include the separated pathway options. However, these bike lanes could be eliminated if the separated pathway is deemed adequate for the anticipated pedestrian and bicycle operations.

• The proposed vertical profile matches the existing vertical profile from Chinden Boulevard to Sandy Court for all alternatives. The existing urban roadway section recently constructed on the west side of the roadway for a portion of Chinden Blvd to Phyllis Canal would be utilized for each alternative for the “interim” five lane section with an urban section to match on the east side of the roadway as shown in Figure 2 below:

![Figure 2 – Chinden Blvd to Phyllis Canal Section View](image)

• The Phyllis Canal structure impacts will be similar for all alternatives. The rise in vertical alignment will make it difficult to salvage the Phyllis Canal main span. Due to the pier configuration this would likely require replacing the jump span over the access road as well. However, the raise in grade will make providing more clearance over the access road, as requested by Pioneer Irrigation District, much less of a challenge. Additionally, the structure will be able to match grade to the south due to the large amount of freeboard over Phyllis Canal itself.

• The impacts to the Boise River South Channel structure will be nearly identical for all alternatives. The sag vertical curve over the South Channel bridge will add just a bit of complexity to the structure vertical alignment. This is due to the camber typically seen in pre-stressed girder bridges. This can be accommodated with added wearing surface thickness or variable haunch thickness on CIP deck structures.
• The Boise River Middle Channel effects will be similar for all alternatives other than Alternative 1B. Purely from a structural standpoint; minimal freeboard to submergence will require consideration of stream pressure forces, debris rafts, and buoyancy. These additional forces can be accommodated by added diaphragms, stronger bearing connections, and increased substructure requirements. Submergence will completely rule out shallow foundations. With the added freeboard in Alternative 1B, stream forces are of no concern. Added vertical can be accommodated by vertical abutment walls.

• The increase in vertical profile at the Boise River North Channel will make it extremely costly if not impossible to salvage the existing structure for all alternatives. The cost of raising the existing bridge would likely be on the order of a full bridge replacement, if not more. For all alternatives, except Alternative 3, the vertical curve will likely add dead loads to the structure to accommodate the vertical alignment. The degree of added load will be determined by where the bents are ultimately located. However, the natural upward camber of pre-stressed girders should flow well with the crest vertical curves. These options lend better to providing pedestrian underpasses on each side of the bridge. However, the vertical clear required for these underpasses will be the driving factor in the final vertical profile of the road. Vertical Alignment Option 2 (Alternatives 2 and 4) will provide for better vertical clear for a pedestrian underpass. However, current vertical clear at the south end of the bridge would not be sufficient; requiring green belters to cross the structure in order to cross Linder Road. The vertical profile would have to be raised substantially for this alternative to provide a pedestrian underpasses at each end of the bridge.

• From an environmental perspective, the alternatives show consistency of impacts to resources with only minimal differences between the alternatives. The minimal differences are unlikely to influence the consideration of further refinements of the vertical or horizontal alignment alternatives as other design parameters would take precedent. Specific environmental considerations are highlighted for each alternative in the following sub-sections.

• The impacts to existing building structures is similar between all alternatives. There are potential impacts to 8 building structures. Seven of these structures are within 25' of the new sidewalk and the other is at 32' from the back of walk. Three of these structures, which are all private residences, are all within the 22’ to 32’ range therefore impacts could be mitigated. The remaining structures which consist of 3 residences and 2 garage/shops would potentially be full buyouts.

• Utility impacts will be similar with all alternatives.

• Irrigation impacts will be similar with all alternatives. As stated previously, the Phyllis Canal structure is anticipated to be replaced as is the Eureka Canal structure. The following irrigation facilities will be impacted with the future roadway widening within the project area:
  - North Slough south of Almaden Drive,
  - Zinger Lateral north of Almaden Drive,
  - Phyllis Canal,
  - Eureka Canal,
seven Suckers Ditch north of Artesian Road,
Harton Davis Canal Crossing, and the
Middleton Mill Canal Crossing.

The conceptual alternatives evaluation was based on the most current hydraulic information for the Boise River channels as defined in the Preliminary Existing Bridge Hydraulic Clearance Summary dated July 17, 2018. TO Engineers has completed the bathymetric survey for the Boise River channels and structure elevations, and the preferred alternative presented later in this report utilizes the Final Hydraulic Report dated February 20, 2019.

2.1 ALTERNATIVE 1 – URBAN ROADWAY SECTION WITH SEPARATED SIDEWALKS (EAST AND WEST)

Alternative 1 reflects Horizontal Alignment Option 1 and Vertical Alignment Option 1 as presented previously. The roadway alignment south of the Phyllis Canal matches the existing horizontal alignment and existing vertical profile in Alternative 1. The sidewalk was separated where possible in this location for a five lane section. Two additional alignments were evaluated as a sub-set to this alternative with Alternative 1A evaluating a shift of the centerline between the Boise River Middle Channel and SH-44 (Horizontal Alignment Option 2) and Alternative 1B analyzing the impacting of raising the elevation of the Boise River Middle Channel structure to provide a 2’ freeboard (Vertical Alignment Option 4). A section view for Alternative 1 is shown below:

Impacts to Boise River Channels: Alternatives 1 and 1A provide approximately 2’ of freeboard at the Boise River South Channel and North Channel structures with 6” of freeboard at the Middle Channel – 5'-6’ raise from existing grade at the Boise River Middle Channel. Alternative 1B allows for 2’ freeboard at all river crossings to include the Middle Channel – 7'-8' raise from existing grade at the Boise River Middle Channel.

Environmental: Alternative 1A is likely one of the most impacting alternatives environmentally. This is due to the vertical profile increase at the Boise River Middle Channel. It is assumed that the vertical profile increase would be associated with a larger impacting footprint in some sensitive riparian habitats. At this level of analysis it is not possible to quantify the extent of potential secondary impacts in the riparian corridor due to the changes in the hydraulic regime and the amount of new right-of-way for Alternative 1B (from vertical profile increase) until the environmental evaluation is complete. However, no significant difference is noted at this time assuming away any unrelated perpetual and reoccurring impacts after construction in order to
maintain the structure. It is assumed that the level of impacts from this alternative are not to the level of significance to preclude it from being cleared environmentally or permitted. Key resources impacted by this alternative are: wetlands, riparian habitats, right-of-way, floodway/floodplain, greenbelt access, historic and cultural resources, construction impacts and visual.

**Drainage:** Alternative 1 setbacks provide areas for potential seepage beds; Vertical Alignment Option 1 - locations of low spots appear to be in spots where there may be room for larger subsurface storage or ponds; positive slopes for drainage.

Alt 1A: Setbacks provide areas for potential seepage beds; Vertical Alignment Option 1 - locations of low spots appear to be in spots where there may be room for larger subsurface storage or ponds; positive slopes for drainage.

Alt 1B: Setbacks provide areas for potential seepage beds; Vertical Alignment Option 4 - locations of low spots appear to be in spots where there may be room for larger subsurface storage or ponds; positive slopes for drainage; Middle Channel structure elevation may create drainage challenges.

**Construction Staging:** All existing structures will require partial removal of existing structure and shoring of embankment during construction phasing. The grade differential between the existing structure and the new structure at the Boise River Middle Channel for Alternatives 1, 1A and 1B may create the need for temporary Linder Road closures.

**Relative Cost Implications:** A 120’ right-of-way is required with this alternative to accommodate the separated sidewalks and 10.6 acres of right-of-way take is estimated. This alternative may require 6 to 8 walls to minimize impacts to existing waterways and property owners. Other specific site impacts are noted on the Alternative 1 Plan and Profile Exhibits shown in Appendix B.

**Impacts on Pedestrians and Bikes:** This alternative allows for 7’ separated sidewalks and 1’ buffered 5’ bike lanes on both the east and west side of the roadway to accommodate pedestrians and bicyclists. This alternative may allow pedestrian underpasses on each side of the Boise River North Channel structure. However, the vertical clear required for these underpasses will be the driving factor in the final vertical profile of the road.

### 2.2 Alternative 2 – Urban Roadway Section with Separated Pathways (East and West)

Alternative 2 reflects Horizontal Alignment Option 1 and Vertical Alignment Option 2 as presented previously. The roadway alignment south of the Phyllis Canal matches the existing horizontal alignment and existing vertical profile in Alternative 2 with a setback pathway for a seven lane section. A section view for Alternative 2 is shown below:
Impacts to Boise River Channels: Alternative 2 provides approximately 2’ of freeboard at the Boise River South Channel and North Channel structures with 6” of freeboard at the Boise River Middle Channel structure – 4-5’ raise from existing grade at the Boise River Middle Channel.

Environmental: At this stage of the analysis, it appears that Alternative 2 is one of the least environmentally damaging alternatives of the full 5-lane options in the 7-lane right-of-way. Key resources impacted by this alternative are wetlands, riparian habitats, right-of-way, floodway/floodplain, greenbelt access, historic and cultural resources, construction impacts and visual.

Drainage: Larger setbacks provide even larger areas for potential seepage beds; Vertical Alignment Option 2– locations of low spots appear to be in spots where there may be room for larger subsurface storage or ponds; there are a couple “flatter” spots, which are not ideal for positive drainage.

Construction Staging: All existing structures will require partial removal of existing structure and shoring of embankment during construction phasing. The grade differential between the existing structure and the new structure at the Boise River Middle Channel should allow for Linder Road to remain operational during construction.

Relative Cost Implications: A 140’ right-of-way is required with this alternative to accommodate the separated pathways and 13.8 acres of right-of-way take is estimated. This alternative may require 6 to 8 walls to minimize impacts to existing waterways and property owners. Other specific site impacts are noted on the Alternative 2 Plan and Profile Exhibits shown in Appendix B.

Impacts on Pedestrians and Bikes: This alternative allows for 10’ separated pathways and 1’ buffered 5’ bike lanes on both the east and west side of the roadway to accommodate pedestrians and bicyclists. Vertical Alignment Option 2 (Alternatives 2 and 4) will provide for better vertical clear for a pedestrian underpass at the Boise River North Channel.

### 2.3 ALTERNATIVE 3 – RURAL ROADWAY SECTION WITH SEPARATED PATHWAY EAST

Alternative 3 reflects Horizontal Alignment Option 1 and Vertical Alignment Option 3 as presented previously. The roadway alignment south of the Phyllis Canal matches the existing horizontal alignment and existing vertical profile in Alternative 3 with a setback sidewalk where possible. A section view for Alternative 3 is shown below:
Impacts to Boise River Channels: Alternative 3 provides approximately 2' of freeboard at the Boise River South Channel and North Channel structures with no freeboard at the Boise River Middle Channel structure – -1' raise from existing grade at the Boise River Middle Channel.

Environmental: Based on the conceptual level analysis it appears that Alternative 3 is one of the least environmentally damaging alternatives of the full 5-lane options in the 7-lane right-of-way. With this alternative, assuming the submergence of the structure at the middle Boise River channel, the potential impacts from the change in the hydraulic regime are identical. When comparing the potential environmental impacts of submerging the structure versus raising it, it is not possible to parse out differences until the environmental evaluation is complete. However, no significant difference is noted at this time assuming away any unrelated perpetual and reoccurring impacts after construction in order to maintain the structure. It is assumed that the level of impacts from this alternative is not to the level of significance to preclude it from being cleared environmentally or permitted. Key resources impacted by this alternative are wetlands, riparian habitats, right-of-way, floodway/floodplain, greenbelt access, historic and cultural resources, construction impacts and visual.

Drainage: Ditches on both sides provide surface storage and there appears to be room for smaller ditches once the roadway section includes 7 lanes; Vertical Alignment Option 3 – Low spot at mid-channel is not ideal for drainage discharging purposes; positive slopes for drainage.

Construction Staging: All existing structures will require partial removal of existing structure and shoring of embankment during construction phasing. The grade differential between the existing structure and the new structure at the Boise River Middle Channel will allow for Linder Road to remain operational during construction.

Relative Cost Implications: A 125' right-of-way is required with this alternative to accommodate the separated pathways and 11.4 acres of right-of-way take is estimated. This alternative may require 4 to 5 walls to minimize impacts to existing waterways and property owners. Other specific site impacts are noted on the Alternative 3 Plan and Profile Exhibits shown in Appendix B.

Impacts on Pedestrians and Bikes: This alternative allows for 10' separated pathways and 1' buffered 5' bike lanes on both the east and west side of the roadway to accommodate pedestrians and bicyclists. As stated earlier a future green belt crossing at the Boise River North Channel will be difficult with this alternative.
2.4 ALTERNATIVE 4 – URBAN ROADWAY SECTION SEPARATED SIDEWALK WEST AND PATHWAY EAST

Alternative 4 reflects Horizontal Alignment Option 2 and Vertical Alignment Option 2 as presented previously. The roadway alignment south of the Phyllis Canal matches the existing horizontal alignment and existing vertical profile in Alternative 4 with a setback sidewalk for a seven lane section. A section view for Alternative 4 is shown below:

![Alternative 4 Section View](image)

**ALTERNATIVE 4**
**URBAN ROADWAY SECTION WITH SEPARATED SIDEWALK - LEFT SIDE SEPARATED PATHWAY - RIGHT SIDE (120' ROW)**

Impacts to Boise River Channels: Alternative 4 provides approximately 2’ of freeboard at the Boise River South Channel and North Channel structures with 6” of freeboard at the Boise River Middle Channel structure – 4'-5' raise from existing grade at the Boise River Middle Channel.

Environmental: Alternatives 4 is one of the most impacting environmentally. However, it is assumed that the level of impacts for this alternative is not to the level of significance to preclude it from being cleared environmentally or permitted. Key resources impacted by this alternative are wetlands, riparian habitats, right-of-way, floodway/floodplain, greenbelt access, historic and cultural resources, construction impacts and visual.

Drainage: Setbacks provide areas for potential seepage beds, smaller setback on west side will provide less area once section includes 7 lanes; Vertical Alignment Alternative 2– locations of low spots appear to be in spots where there may be room for larger subsurface storage or ponds; there are a couple “flatter” spots which are not ideal for positive drainage.

Construction Staging: All existing structures will require partial removal of existing structure and shoring of embankment during construction phasing. The grade differential between the existing structure and the new structure at the Boise River Middle Channel should allow for Linder Road to remain operational during construction.

Relative Cost Implications: A 120’ right-of-way is required with this alternative to accommodate the separated sidewalks and 10.6 acres of right-of-way take is estimated. This alternative may require 6 to 8 walls to minimize impacts to existing waterways and property owners. Other specific site impacts are noted on the Alternative 4 Plan and Profile Exhibits shown in Appendix B.

Impacts on Pedestrians and Bikes: This alternative allows for a 7’ separated sidewalk to the west, a 10’ separated pathway to the east and 1’ buffered 5’ bike lanes on both the east and west side of the roadway.
to accommodate pedestrians and bicyclists. The 7' sidewalk would be adjacent to the roadway in the seven lane section, however the separated pathway to the east would maintain some separation. Vertical Alignment Option 2 (Alternatives 2 and 4) will provide for better vertical clear for a pedestrian underpass at the Boise River North Channel.

2.5 **ALTERNATIVE 5 – RURAL ROADWAY SECTION WITH SEPARATED SIDEWALKS EAST AND WEST**

Alternative 5 reflects Horizontal Alignment Option 2 and Vertical Alignment Option 1 as presented previously. The roadway alignment south of the Phyllis Canal matches the existing horizontal alignment and existing vertical profile in Alternative 5 with a setback sidewalk where possible. A section view for Alternative 5 is shown below:

![Figure 7 – Alternative 5 Section View](image)

**ALTERNATIVE 5**

**RURAL ROADWAY SECTION WITH SEPARATED SIDEWALKS EAST AND WEST (120’ ROW)**

Impacts to Boise River Channels: Alternative 5 provides approximately 2’ of freeboard at the Boise River South Channel and North Channel structures with 6” of freeboard at the Middle Channel – 5’-6’ raise from existing grade at the Boise River Middle Channel.

Environmental: Alternative 5 is one of the most impacting environmentally. However, it is again assumed that the level of impacts from this alternative is not to the level of significance to preclude it from being cleared environmentally or permitted. Key resources impacted by this alternative are wetlands, riparian habitats, right-of-way, floodway/floodplain, greenbelt access, historic and cultural resources, construction impacts and visual.

Drainage: Ditches on both sides provide surface storage and there appears to be room for smaller ditches once section includes 7 lanes; Vertical Alignment Alternative 1 - locations of low spots appear to be in spots where there may be room for larger subsurface storage or ponds; positive slopes for drainage.

Construction Staging: All existing structures will require partial removal of existing structure and shoring of embankment during construction phasing. The grade differential between the existing structure and the new structure at the Boise River Middle Channel may create the need for temporary Linder Road closures.

Relative Cost Implications: A 120’ right-of-way is required with this alternative to accommodate the separated sidewalks and 10.6 acres of right-of-way take is estimated. This alternative may require 4 to 5 walls to minimize impacts to existing waterways and property owners. Other specific site impacts are noted on the Alternative 5 Plan and Profile Exhibits.

Impacts on Pedestrians and Bikes: This alternative allows for 7’ separated sidewalks and 1’ buffered 5’ bike lanes on both the east and west side of the roadway to accommodate pedestrians and bicyclists. This
alternative may allow pedestrian underpasses on each side of the North Channel structure. However, the vertical clearance required for these underpasses will be the driving factor in the final vertical profile of the road.

### 2.6 Recommendations

Based on the conceptual alternatives evaluation, the following alignment options and alternatives were recommended to be carried forward for further design analysis. Following are the recommendations from the conceptual alignment alternatives evaluation of Linder Road, from US 20/26 to SH-44:

- **Vertical Alignment Option 2** with 2’ of freeboard at the Middle Channel is preferred as this will provide 2’ of freeboard at all Boise River crossings, tangents across the structures as well as some additional clearance for a future pedestrian crossing at the Boise River North Channel. A clearance goal of 2’ above the low chord of the bridge is recommended in order to allow for 1’ of water elevation increase due to floodplain development as anticipated in FEMA’s floodway calculation, plus an additional 1’ for debris passage. A Value Engineering Study will be performed at the preliminary design level to evaluate the cost benefits of reducing the freeboard requirements to 1’.

- **Horizontal Alignment Option 2** is preferred as this minimizes impacts to the existing pond sites on the west side of Linder Road north of the Middle Channel. Option 2 also improves the constructability of the North Channel structure by allowing for a more useable portion of the existing structure to remain in place during construction.

- Alternatives 1A and 4 with Vertical Option 2 were recommended to be carried forward for further evaluation. Alternative 3, with Horizontal Alignment Option 2 and Vertical Option 2, was also recommended as this will provide a rural roadway section analysis which will minimize initial construction costs as well as costs to transition from a five lane facility to a seven lane facility.

- Sidewalks and pathways will be located to accommodate the ultimate seven lane roadway section with setback sidewalks at 5’. Ultimate roadway section with sidewalks should include 2’ buffer area and 6’ bike lanes. The “interim” five lane roadway section from Chinden Blvd to Phyllis Canal should be an urban section to match the recently improved west side of the existing roadway as shown in Figure 8 below:

![Urban Roadway Section - Right Half Only: Chinden Blvd to Phyllis Canal](image-url)
3 ALTERNATIVES MATRIX

A Draft Alternatives Matrix was created for ACHD’s review and comment which presented a thorough comparison between the alternatives recommended at the conceptual level as defined in Section 2. Impacts were defined for right-of-way and property owners, environmental, structures, irrigation, utilities, drainage, pedestrians and bikes, construction staging, and relative construction cost for each alternative. The alternatives presented in the matrix corresponded to the recommended Alternative 1A (shown as Alternative 1), Alternative 3 (shown as Alternative 2A) and 4 (shown as Alternative 3) from the Conceptual Alignment Alternatives Evaluation with the addition of a modified Alternative 3 (shown as Alternative 2) to incorporate separated pathways on both sides of the roadway.

The project team discussed the advantages and disadvantages with each alternative and determined that the rural roadway section in the interim 5 lane condition provides significant advantages over the urban interim section. The rural roadway section will minimize initial construction costs as well as costs to transition from a five lane facility to a seven lane facility which is anticipated to occur well before the end of the design life of the interim roadway pavement section. All alternatives recommend an urban roadway section for the ultimate seven lane corridor due to the significant impacts of a rural seven lane section from a right-of-way and drainage perspective. Two alternatives were carried forward for inclusion in the Final Alternatives Matrix. ACHD requested that refined alternatives present similar facilities for pedestrians on both sides of the roadway for consistency and increased safety as is reflected in the alternatives presented as well as buffered bike lanes. Alternative A shows a rural roadway section for the interim five lane condition with separated pathways as shown in Figure 9:

Alternative B depicts a rural roadway section for the interim five lane condition with separated sidewalks:

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**Figure 9 – Alternative A Section View**

**Figure 10 – Alternative B Section View**
Alternatives A and B were recommended to be carried forward to the public meeting in order to evaluate the public’s preference of separated pathways versus separated sidewalks. The Draft and Final Alternatives Matrix can be found in Appendix C. See Appendix D for project team comments and meeting notes regarding conceptual alternatives discussions.

4 ALTERNATIVES FOR PUBLIC COMMENT

4.1 ALTERNATIVES PRESENTED AT PUBLIC MEETING
Alternatives A and B were carried forward for public comment at the public meeting held on December 3, 2018. Refinements were made to these alternatives based on ACHD’s review of the public meeting exhibits to provide an 8’ buffer area between the proposed back of curb to the edge of sidewalk/pathway. The revised section views for both alternatives are shown below:

**ALTERNATIVE A**
5 LANE RURAL - NO BIKE LANE/SEPARATED PATHWAYS (125' ROW)

Figure 11 – Alternative A Section View (revised)

**ALTERNATIVE B**
5 LANE RURAL - BIKE LANE/SEPARATED SIDEWALKS (126' ROW)

Figure 12 – Alternative B Section View (revised)

ACHD requested the incorporation of ultimate five lane roadway section alternatives for the public meeting exhibits to evaluate the public’s opinion for the preservation of a seven lane roadway section. Therefore, two additional alternatives were added to show an ultimate five lane urban roadway section with separated sidewalks as well as separated pathways. The final alternatives presented at the public meeting are shown on the following pages:
**ALTERNATIVE A:** Five Lanes to Seven Lanes with Shared Pathway

![Image of Alternative A](image1)

Figure 13 – Alternative A Section View from PIM

**ALTERNATIVE B:** Five Lanes Only with Shared Pathway

![Image of Alternative B](image2)

Figure 14 – Alternative B Section View from PIM

**ALTERNATIVE C:** Five Lanes to Seven Lanes with Buffered Bike Lanes and Sidewalk

![Image of Alternative C](image3)

Figure 15 – Alternative C Section View from PIM

**ALTERNATIVE D:** Five Lanes Only with Buffered Bike Lanes and Sidewalk

![Image of Alternative D](image4)

Figure 16 – Alternative D Section View from PIM

Exhibits displaying a plan view of the corridor for each alternative presented at the public meeting can be found in Appendix E.
5 PREFERRED ALTERNATIVE

The public involvement meeting was held on December 3, 2018. There were 119 people that signed in at this open house with 70 comment sheets received during the meeting. Comments were accepted until December 17th and 136 comments were received in total. Based on the comments that were received the public preferred Alternative A with 46% of the respondents selecting this alternative and 61% of the respondents preferring the preservation of an ultimate seven lane corridor. Figure 16, shown below, displays the comment response percentages for each of the alternatives presented at the public information meeting:

![Comment Response Percentages from PIM](image)

The publics preferred alternative, Alternative A, was presented at the February 6 ACHD commission meeting. Staff and commission discussed the findings from the December 3 public meeting and concurrence was received to proceed to the next study and design phases with the preferred Alternative A as shown in Figure 18 below:

**ALTERNATIVE A: Five Lanes to Seven Lanes with Shared Pathway**

![Preferred Alternative](image)
The preferred alternative above presents an interim five lane rural roadway section with 10’ separated multi-use pathways with the preservation for an ultimate seven lane urban roadway section. Plan and profile sheets were created for the preferred alternative which reflect a vertical profile that matches the existing vertical profile from Chinden Boulevard to Sandy Court for all alternatives. The preferred alternative reflects 2’ of freeboard at the Middle Channel, as discussed in Section 2, as this will provide 2’ of freeboard at all Boise River crossings as well as some additional clearance for a future pedestrian crossing on the north side of the Boise River North Channel. A clearance goal of 2’ above the low chord of the bridge is recommended at the concept level in order to allow for 1’ of water elevation increase due to floodplain development as anticipated in FEMA’s floodway calculation, plus an additional 1’ for debris passage. The pedestrian crossing is recommended to be placed on the north side of the Boise River North Channel as the existing high water mark is lower than the south side. A Value Engineering Study will be performed at the preliminary design level to evaluate the cost benefits of reducing the freeboard requirements to 1’. Appendix F includes plan and profile exhibits for the preferred alternative.
Appendices
Appendix A – Linder Road Alternative Summary
Linder Road Alternatives Summary

Linder Road South of the Phyllis Canal structure –
Retain and Protect Existing with Sidewalk LT Side from Island Green Dr. to Temple Ln. (Match Existing Profile)
  1. Match Existing Offsets for 5 Lane, Separate where possible (Shown in Alternatives 1,1A,1B,3,5)
  2. Set Back for Additional Lane - 60’ ROW (Shown in Alternatives 2,4)

Roadway RT Side from Fred Meyer to Phyllis Canal (Match Existing Profile)
  1. Widen to 5 Lanes with Separated Walk - 60’ ROW (Shown in Alternatives 1,1A,1B,3,4,5)

Linder Road North of the Phyllis Canal structure –
Sidewalk and/or Separated Pathway from Phyllis Canal to SH 44 Both Sides (New Profile)

Roadway Typical Section Alternatives -
Alternative 1 – Urban Roadway Section with Separated Sidewalk Both Sides (120’ ROW)
  Sidewalk could be Adjacent or Separated @ 7 Lanes
  Alternative 1A reflects Horizontal Alignment Option 2
  Alternative 1B reflects Vertical Alignment Option 4

Alternative 2 – Urban Roadway Section with Separated Pathway Both Sides (140’ ROW)
  Sidewalk could be Adjacent or Separated @ 7 Lanes

Alternative 3 – Rural Roadway Section with Separated Pathway Rt Side (125’ ROW)
  Pathway could be Adjacent or Separated @ 7 Lanes but likely need Curb/Gutter

Alternative 4 – Urban Roadway Section with Separated Sidewalk Lt Separated Pathway Rt (120’ ROW)
  Lt Sidewalk is Adjacent in 7 Lane, Rt Pathway still Separated

Alternative 5 – Rural Roadway Section with Separated Sidewalk Both Sides (120’ ROW)
  Sidewalk could be Adjacent or Separated @ 7 Lanes but would need Curb/Gutter

Horizontal Alignment Options -
Option 1 – Maintain Existing Centerline (Shown in Alternatives 1,1B,2,3)
Option 2 – Shift Centerline between Middle Channel and SH-44 (Shown in Alternatives 1A, 4, 5)

Vertical Alignment Options -
Option 1 – Raise Grade at all structures with Vertical Curve in center of Middle & North Bridges
  6” Freeboard at middle channel – 5-6’ raise from existing (shown in Alternatives 1,1A,5)
Option 2 – Raise Grade at all structures with tangents on Middle & North Bridges
  6” Freeboard at middle channel – 4-5’ raise from existing (shown in Alternatives 2,4)
Option 3 – Raise Grade at North & South structures only, allow Middle to overtop
  -current condition (shown in Alternatives 3)
Option 4 – Raise Grade at all structures with Vertical Curve in center of Middle & North Bridges
  achieves 2’ Freeboard at middle channel – 7-8’ raise from existing (shown in Alternative 1B)
Appendix B – Conceptual Alignment Alternatives Evaluation Plans and Profile Exhibits
Appendix C – Draft and Final Alternatives Matrix
# Linder Road Concept Study Alternatives Matrix

**Item for Comparison**

<table>
<thead>
<tr>
<th></th>
<th>Alt 1: Urban section with separated sidewalks both sides</th>
<th>Alt 2: Rural section with separated pathway both sides</th>
<th>Alt 2A: Rural section with separated pathway r t side only</th>
<th>Alt 3: Urban section with adjacent sidewalk lt and separated pathway rt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RiGHT-O-F-WAY &amp; LAND USE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right-of-Way Width Required</td>
<td>127'</td>
<td>137'</td>
<td>125'</td>
<td>120'</td>
</tr>
<tr>
<td>Approximate Additional Right-of-Way Required (acres)</td>
<td>11.20</td>
<td>14.60</td>
<td>12.00</td>
<td>11.20</td>
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<tr>
<td>Number of Residential Parcels Impacted</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Number Business Parcels Impacted But Not Displaced</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Number of Potential Full Takes</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Number Homes Impacted But Not Displaced</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Impacts on Existing Irrigation Facilities</strong></td>
<td>Relocation and/or replacement of facilities on both sides of roadway.</td>
<td>Relocation and/or replacement of facilities on both sides of roadway.</td>
<td>Relocation and/or replacement of facilities on both sides of roadway.</td>
<td>Relocation and/or replacement of facilities on both sides of roadway.</td>
</tr>
<tr>
<td><strong>Right-Of-Way &amp; Land Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Existing Ponds</td>
<td>Impacts to 4 pond sites.</td>
<td>Impacts to 4 pond sites.</td>
<td>Impacts to 3 pond sites.</td>
<td>Impacts to 3 pond sites.</td>
</tr>
<tr>
<td>Freeboard Provided</td>
<td># of freeboard is provided on the North Channel and the South Channel with 1' of freeboard on the Middle Channel. Same for all alternatives.</td>
<td># of freeboard is provided on the North Channel and the South Channel with 1' of freeboard on the Middle Channel. Same for all alternatives.</td>
<td># of freeboard is provided on the North Channel and the South Channel with 1' of freeboard on the Middle Channel. Same for all alternatives.</td>
<td># of freeboard is provided on the North Channel and the South Channel with 1' of freeboard on the Middle Channel. Same for all alternatives.</td>
</tr>
<tr>
<td><strong>Structures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>River and Canal Crossings</td>
<td>2 canal and 3 river crossings required for all alternatives. Same structure geometrics for all alternatives.</td>
<td>2 canal and 3 river crossings required for all alternatives. Same structure geometrics for all alternatives.</td>
<td>2 canal and 3 river crossings required for all alternatives. Same structure geometrics for all alternatives.</td>
<td>2 canal and 3 river crossings required for all alternatives. Same structure geometrics for all alternatives.</td>
</tr>
<tr>
<td>Pedestrian Crossings</td>
<td>Pedestrian undercrossings recommended at north &amp; south river crossings as bike lanes are provided or at grade crossings could be provided.</td>
<td>Pathway undercrossings recommended at north &amp; south river crossings as bike lanes are not provided or at grade crossing will be necessary.</td>
<td>Pathway undercrossings recommended at north &amp; south river crossings as bike lanes are not provided or at grade crossing will be necessary.</td>
<td>Pathway undercrossings recommended at north &amp; south river crossings as bike lanes are not provided or at grade crossing will be necessary.</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Resources Impacted</td>
<td>Wetlands, riparian habitats, right-of-way, roadway/footprint, greenbelt access, historic and cultural resources, construction impacts and visual. Same for all alternatives.</td>
<td>Wetlands, riparian habitats, right-of-way, roadway/footprint, greenbelt access, historic and cultural resources, construction impacts and visual. Same for all alternatives.</td>
<td>Wetlands, riparian habitats, right-of-way, roadway/footprint, greenbelt access, historic and cultural resources, construction impacts and visual. Same for all alternatives.</td>
<td>Wetlands, riparian habitats, right-of-way, roadway/footprint, greenbelt access, historic and cultural resources, construction impacts and visual. Same for all alternatives.</td>
</tr>
<tr>
<td><strong>Impacts to Waterways</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Existing Ponds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freeboard Provided</td>
<td># of freeboard is provided on the North Channel and the South Channel with 1' of freeboard on the Middle Channel. Same for all alternatives.</td>
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</tr>
<tr>
<td><strong>Roadway Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Impacts on Drainage</td>
<td>Small area for infiltration beds on both sides between roadway &amp; sidewalks. Drainage system could be partially under sidewalk when roadway is expanded to 7 lanes.</td>
<td>Moderate areas for swales/infiltration beds on both sides between roadway &amp; pathway.</td>
<td>Less impact but also less opportunity for drainage swales on east side of roadway; however west side could provide room for a small ditch. Moderate area for swales/infiltration beds on east side between roadway &amp; pathway. Drainage system could potentially be accommodated on one side.</td>
<td>Limited area for infiltration swales/infiltration beds on east side of roadway. Large area for swales on infiltration beds on east side between roadway &amp; pathway.</td>
</tr>
<tr>
<td>Construction Staging</td>
<td>Roadway will be built to allow two lanes of travel to remain on existing lanes during first phase and then two lanes of traffic would shift to new roadway while remaining improvements are constructed.</td>
<td>Roadway should allow for vehicle travel during construction, creating better workzone separation. The staging of drainage infrastructure is less critical.</td>
<td>Roadway should allow for vehicle travel during construction, creating better workzone separation. The staging of drainage infrastructure is less critical.</td>
<td>Roadway will be built to allow two lanes of travel to remain on existing lanes during first phase and then two lanes of traffic would shift to new roadway while remaining improvements are constructed.</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>Same for all alternatives.</td>
<td>Same for all alternatives.</td>
<td>Same for all alternatives.</td>
<td>Same for all alternatives.</td>
</tr>
<tr>
<td><strong>Relative Cost Implications</strong></td>
<td>$4.05M</td>
<td>$3.94M</td>
<td>$3.58M</td>
<td>$3.92M</td>
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<tr>
<td><strong>Impacts on Pedestrians and Bikes</strong></td>
<td>Bike lanes and sidewalks transition to shared use path between south and north channels with pathways on both sides of roadway.</td>
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<td>Bike lanes and sidewalks transition to shared use path between south and north channels with pathways on both sides of roadway.</td>
<td>Bike lanes transition to shared use path between south and north channels with pathway on east side of roadway. Sidewalks on east side for walking/riding for entire route. Would require undercrossings of Linder Road for bikeways to use pathway at both north and south channels or at grade crossings.</td>
</tr>
</tbody>
</table>

*Reflects costs based on roadway quantities for the "interim 5 lane" roadway section only.
<table>
<thead>
<tr>
<th><strong>ITEM FOR COMPARISON</strong></th>
<th><strong>Alt A: Rural section with separated pathway both sides</strong></th>
<th><strong>Alt B: Rural section with separated sidewalks both sides</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RIGHT-OF-WAY &amp; LAND USE</strong></td>
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<td>Right-of-Way Width Required</td>
<td>120'</td>
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<td>Approximate Additional Right-of-Way Required (acres)</td>
<td>11.20</td>
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<td>Number of Residential Parcels Impacted</td>
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<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Number of Potential Full Takes</td>
<td>5</td>
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</tr>
<tr>
<td>Number Homes Impacted But Not Displaced</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Number of Business Parcels Impacted</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Impacts on Existing Irrigation Facilities</td>
<td>Relocation and/or replacement of facilities on both sides of roadway. Same for all alternatives.</td>
<td>Relocation and/or replacement of facilities on both sides of roadway. Same for all alternatives.</td>
</tr>
<tr>
<td>Impacts on Utility Facilities</td>
<td>Same for all alternatives</td>
<td>Same for all alternatives</td>
</tr>
<tr>
<td><strong>STRUCTURES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>5 (Potential extra retaining wall for fill/drainage along adjacent driveway STA 142-145)</td>
<td>5 (Potential extra retaining wall for fill/drainage along adjacent driveway STA 142-145)</td>
</tr>
<tr>
<td>River and Canal Crossings</td>
<td>2 canal and 3 river crossings required for all alternatives. Same structure geometrics for all alternatives.</td>
<td>2 canal and 3 river crossings required for all alternatives. Same structure geometrics for all alternatives.</td>
</tr>
<tr>
<td>Pedestrian Crossings</td>
<td>Pathway undercrossings or at grade crossing recommended at north &amp; south river crossings as bike lanes are not provided in order to allow bicyclists and pedestrians access to both sides of the roadway.</td>
<td>Pedestrian at grade crossings or undercrossings potential at north &amp; south river crossings as bike lanes are provided which will allow bicyclists and pedestrians access to both sides of the roadway.</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key Resources Impacted</td>
<td>Wetlands, riparian habitats, right-of-way, floodway/floodplain, greenbelt access, historic and cultural resources, construction impacts and visual.</td>
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</tr>
<tr>
<td><strong>IMPACTS TO WATERWAYS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact to Existing Ponds</td>
<td>Impacts to 4 pond sites.</td>
<td>Impacts to 4 pond sites.</td>
</tr>
<tr>
<td>Freeboard Provided</td>
<td>2’ of freeboard is provided at all river crossings.</td>
<td>2’ of freeboard is provided at all river crossings.</td>
</tr>
<tr>
<td><strong>ROADWAY DESIGN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Impacts on Drainage</td>
<td>Moderate areas for swales/infiltration beds on both sides between roadway &amp; pathway.</td>
<td>Small area for infiltration beds on both sides between roadway &amp; sidewalks. Drainage system would be partially under sidewalk when roadway is expanded to 7 lanes.</td>
</tr>
<tr>
<td>Construction Staging</td>
<td>Roadway shoulder allows for vehicle travel during construction, creating better workzone separation. The staging of drainage infrastructure is less critical with the rural section.</td>
<td>Roadway shoulder allows for vehicle travel during construction, creating better workzone separation. The staging of drainage infrastructure is less critical with the rural section.</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>Same for all alternatives</td>
<td>Same for all alternatives</td>
</tr>
<tr>
<td>Relative Cost Implications*</td>
<td>$3.94M</td>
<td>$3.89M</td>
</tr>
<tr>
<td>Impacts on Pedestrians and Bikes</td>
<td>Bike lanes and sidewalks transition to shared use path between south and north channels with pathways on both sides of roadway.</td>
<td>Bike lanes and sidewalks both sides entire route</td>
</tr>
</tbody>
</table>

*Reflects costs based on roadway quantities for the "interim 5 lane" roadway section only.
Appendix D – Alternatives Comment Summary and Notes
# Meeting Minutes

**Project No.:** 518020 (Horrocks #ID-1101-1803)  
**Date(s):** August 9, 2018  
**Location:** ACHD Auditorium  
**Purpose:** Linder Road Concept Study Project Team Meeting  
**Prepared By:** Jeremy Hunting  
**Issue Date:** August 14, 2018

## Attendees:

<table>
<thead>
<tr>
<th>Client:</th>
<th>Consultant:</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Corcoran, ACHD</td>
<td>Heidi Carter, Horrocks</td>
</tr>
<tr>
<td>Dale Kuperus, ACHD</td>
<td></td>
</tr>
<tr>
<td>Pierson Dewit, ACHD</td>
<td>Jeremy Hunting, Horrocks</td>
</tr>
<tr>
<td>Cody Homan, ACHD</td>
<td></td>
</tr>
<tr>
<td>Josh Saak, ACHD</td>
<td></td>
</tr>
<tr>
<td>Christy Foltz-Ahrichs, ACHD</td>
<td></td>
</tr>
<tr>
<td>Gary Inselman, ACHD</td>
<td></td>
</tr>
<tr>
<td>Erica Anderson-Maquire, ACHD</td>
<td></td>
</tr>
<tr>
<td>Carson Shaw, ACHD</td>
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## Discussion Topics:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Discussion Items</th>
<th>Action Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Background information on meetings purpose and intent was described.</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| 2        | The traffic memorandum was discussed to present Horrocks’ approach to addressing ACHD’s additional comments. ACHD stated that they would like the memorandum edited to minimize the discussion on the various analysis methods and growth rates, and focus on how the data was used to reach the final conclusions. The report will be revised to:  
  - minimize discussion on the various alternatives and better define the methodology so it speaks to designing to the ACHD policies and thresholds in place,  
  - add an executive summary summarizing critical points of the analysis and the recommendations,  
  - define the 7-Lane “Ultimate” and 5-Lane “Interim” conditions and match these with all alternatives moving forward,  
  - include discussion on additional information provided by COMPASS on foothills growth and model assumptions for surrounding state highway system, and  
  - include discussion on ITD programmed funding for SH-44 and US 20/26 improvements in the project area. | Horrocks will revise the traffic memorandum as noted and resubmit.                               |
| 3        | The project status was discussed and key submittal deadlines were presented. The next public meeting date was also discussed and it was agreed to delay the public involvement meeting and the ACHD commission presentation to allow the project team more time to understand and evaluate the project alternatives more completely, revise the final traffic report, and gather more data on hydraulics, bridge and drainage. A late October or early November timeline for the PIM was suggested. | Horrocks will finalize the traffic report and prepare an alternatives matrix for the evaluation of the three alternatives agreed upon by the project team. |
| 4        | The typical sections were discussed and it was requested these be modified so that the bike lanes are removed adjacent to the travel lanes for alternatives where a shared use pathway is shown. A 14’ travel lane (to face of curb) should be provided adjacent to the curb when no bike lane is present. Buffer areas for the bike lanes adjacent to the roadway shall be 2’. | Horrocks will revise typical sections as noted.                                                  |
The five typical section alternatives were discussed and it was agreed that the typicals to move forward with will be:

- Alternative 1 – Urban Roadway Section with Separated Sidewalk Both Sides (Alt 1A in Alternatives Evaluation)
- Alternative 2 – Rural Roadway Section with Separated Pathway Rt Side (Alt 3 in Alternatives Evaluation)
- Alternative 2A – Rural Roadway Section with Separated Pathway Both Sides (Alt 3 in Alternatives Evaluation)
- Alternative 3 – Urban Roadway Section with Separated Sidewalk Lt Separated Pathway Rt (Alt 4 in Alternatives Evaluation)

Horrocks will revise plan and profiles and prepare an alternatives matrix for these alternatives.

The horizontal and vertical alignment alternatives were discussed. Horrocks stated that Vertical and Horizontal Options 2 are recommended as these minimize project impacts. ACHD requested that the vertical alignment reflect 1’ of freeboard at the Middle Channel. The project team agreed to carry forward these horizontal and vertical alignment options for all alternatives.

Horrocks will revise plan and profiles and prepare an alternatives matrix for these alternatives.

The typical sections for the bridges was discussed. The project team agreed that all bridge sections should include 7 lanes with the bike lanes removed for alternatives with shared pathways.

Horrocks will proceed with concept analysis for 7 lanes on all structures.

A pedestrian crossing for the greenbelt was discussed and the project team agreed that based on available data and the most recent development planning along the Boise River greenbelt system, a pedestrian crossing on the south side of the North Channel is the preferred location. At grade crossing locations were discussed and these locations will be evaluated further as the concept design progresses.

Horrocks will proceed with the concept design reflecting a pedestrian crossing for the Boise River green belt at the North Channel structure.

Cc: David Corcoran, Heidi Carter, File ID-1101-1803
Meeting Minutes

Project No.: 518020 (Horrocks #ID-1101-1803) | Date(s): October 2, 2018
Location: ACHD SiteR
Purpose: Linder Road Concept Study Project Team Meeting
Prepared By: Jeremy Hunting | Issue Date: October 10, 2018

Attendees:
Client: David Corcoran, ACHD  Caitlin Allawatt, ACHD
       Dale Kuperus, ACHD
       Pierson Dewit, ACHD  Consultant: Heidi Carter, Horrocks
       Cody Homan, ACHD
       Josh Saak, ACHD
       Christy Foltz-Ahlrichs, ACHD  Steve Holt, TO Engineers
       Gary Inselman, ACHD  William Rice, TO Engineers

Discussion Topics:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Discussion Items</th>
<th>Action Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Background information on meetings purpose and intent was described.</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>The traffic memorandum was discussed to present Horrocks' changes to address ACHD's additional comments for the final report. In the report there are two methodologies (HCS &amp; Max Threshold tables) outlined for basis of comparison. The project team agreed that the final conclusions and recommendations should be based on the maximum threshold tables in the final memorandum. The HCS information will still be shown as a secondary discussion.</td>
<td>Horrocks will revise the traffic memorandum as noted and submit a final signed and stamped document.</td>
</tr>
<tr>
<td>3</td>
<td>The project status and timing of some of the submittals, more specifically the public meeting, were briefly discussed. Everything appears to be on track with what was previously submitted.</td>
<td>Heidi, David and Christy will coordinate separately to solidify dates.</td>
</tr>
<tr>
<td>4</td>
<td>The typical sections to take forward to the public were discussed. The consensus was to take two typicals forward, both showing a 5 lane interim rural section with a 7 lane urban final buildout. One typical will have bike lanes on the roadway with setback sidewalks, the other will have separated joint-use pathways and no bike lanes. The proposed ROW, bridge structures, and drainage will be shown in their final 7 lane configuration. There was discussion of only doing a singular pathway to one side of the roadway, but the team recommended against only having pedestrian facilities on one side as well as having different types of pedestrian facilities on one side of the roadway (i.e. sidewalk on one side and pathway on the other).</td>
<td>Horrocks will revise typical sections and roll plots as noted.</td>
</tr>
<tr>
<td>5</td>
<td>The horizontal and vertical alignment alternatives were discussed briefly. Vertical and Horizontal Options 2 are still the preferred alternatives and will carry forward with the two typical options. Horrocks has made some minor revisions to the vertical based on TO's hydraulic analysis and modeling, and all of the structures now meet or exceed the required 2' of freeboard. There will be some very minor adjustments to the vertical to change the running grade across the bridges to meet the minimum ACHD standards (.25% to .30%).</td>
<td>Horrocks will revise alignments as noted.</td>
</tr>
<tr>
<td></td>
<td>The typical sections for the bridges was discussed. The project team agreed that all bridge sections should include 7 lanes.</td>
<td>Horrocks will proceed with concept analysis for 7 lanes on all structures.</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>7</td>
<td>Pedestrian crossings were briefly discussed and the project team decided to move forward with including crossings at both the North and South channels. The crossings would be recommended with the pathways typical alternative, as the roadway would need to transition from bike lanes to pathways between the two channels.</td>
<td>Horrocks will proceed with the concept design reflecting both pedestrian crossings.</td>
</tr>
<tr>
<td>8</td>
<td>TO discussed the findings and results of the hydraulics analysis and modeling. With the current proposed improvements, it appears the project may be able to meet the floodway No-Rise requirements. However, the grade raise of the roadway and new bridge/retaining wall structures present enough of an impact to the floodplain that a CLOMR will likely be warranted. The project team agreed to take this information to the Ada County floodplain administrator and get their input on the matter. TO also presented a couple of preliminary ideas for potential floodplain mitigation with culvert crossings.</td>
<td>Heidi and Steve will set up a meeting with the Ada County and forward invitation to ACHD.</td>
</tr>
</tbody>
</table>

Cc: David Corcoran, Heidi Carter, File ID-1101-1803
<table>
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<tr>
<th>Document</th>
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<tbody>
<tr>
<td>Gary Inselman - ACHD Development Services</td>
<td></td>
<td></td>
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<tr>
<td>The alignments should not assume bike lanes on the road with multi-use pathways.</td>
<td></td>
<td>Agree. Bike lanes have been removed in the pathway alternatives with the alternatives submitted with the alternatives matrix.</td>
<td></td>
</tr>
<tr>
<td>We requested a vertical option of 1 foot of freeboard at the middle channel at the last meeting, this option should be carried forward.</td>
<td></td>
<td>The vertical profile for the Middle Channel was adjusted to show 2' of freeboard with the additional hydraulic analysis considering flood relief structures at the Middle Channel.</td>
<td></td>
</tr>
<tr>
<td>Alternative 4 should be dropped. I can’t see ACHD building a pathway on one side and a bike lane and sidewalk on the other side.</td>
<td></td>
<td>Agree. This alternative was eliminated from the alternatives presented with the Alternatives Matrix.</td>
<td></td>
</tr>
<tr>
<td>Sidewalks and pathways should be built to not need to be removed and replaced when the road widens to 7 lanes.</td>
<td></td>
<td>Agree. All alternatives presented show sidewalks and pathways in the &quot;ultimate 7 lane&quot; section location.</td>
<td></td>
</tr>
<tr>
<td>Alternative numbers don’t match between the memo and the matrix.</td>
<td></td>
<td>Agree. Alternative numbers were adjusted with the alternatives matrix submittal eliminating the alternatives that were not carried forward from the alternatives evaluation as stated with the submittal.</td>
<td></td>
</tr>
<tr>
<td>Recommendation in the memo includes a vertical option for 6” freeboard at middle channel; the matrix has 1 foot of freeboard at the middle channel for all alternatives. The memo does not even evaluate a 1 foot freeboard option at the middle channel.</td>
<td></td>
<td>The additional freeboard was provided with the alternatives presented with the alternatives matrix as requested by ACHD.</td>
<td></td>
</tr>
<tr>
<td>Do we have old memo or did it not get updated?</td>
<td></td>
<td>The memo was not revised as the alternatives matrix was presented to differentiate between the revised alternatives. The Alignment Alternatives Evaluation will be revised to include the alternatives matrix and the final alternatives to be carried forward to the public meeting to document the discussions and decisions that led to the final alternatives.</td>
<td></td>
</tr>
<tr>
<td>Pierson Dewitt - ACHD Design</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vertical Alignment Option 1 indicates a freeboard of 6” at the Middle Channel – The minimum freeboard we would accept is 1’ at this crossing.</td>
<td>Agree. The alternatives presented with the Alternatives Matrix have all been revised to show additional freeboard as requested.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vertical Alignment Option 2 indicates a freeboard of 6” at the Middle Channel – The minimum freeboard we would accept is 1’ at this crossing.</td>
<td>Agree. The alternatives presented with the Alternatives Matrix have all been revised to show additional freeboard as requested.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vertical Alignment Option 3 indicates a freeboard of 0” at the Middle Channel – The minimum freeboard we would accept is 1’ at this crossing.</td>
<td>Agree. The alternatives presented with the Alternatives Matrix have all been revised to show additional freeboard as requested.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>This might be answered later in the document but was an option analyzed with a separated pathway that can be preserved once the 7-lane facility is built?</td>
<td>All alternatives presented show sidewalks and pathways in the “ultimate 7 lane” section location.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Alternatives 2 and 4 - Can a surface cut accommodate the additional height needed to allow for a south end crossing under the bridge?</td>
<td>No it cannot. This approach has been discussed with the consultant team and there are significant hydraulic and environmental implications with this approach.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>What differences between Alt 2 and 3 reduce the proposed Middle Channel freeboard from 6” to 0’?</td>
<td>Alternative 2 introduces a crest vertical curve to raise the grade over the middle channel while Alternative 3 leaves the middle channel close to its existing condition with a sag vertical curve.</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>In the body of the text it would be beneficial to incorporate the proposed typical section when discussing the Alternatives. Both the 5 and 7 lane sections for each alternative would really help streamline the text presented.</td>
<td>Agree. Will add the typicals to the text in the revised document.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>You are discussing Alternative 4 but under the environmental section you identify alternative 4 and 5 as the most environmentally impacting, what is the intent here? Comparison purposes for both alt’s while indicating the impacts to Alt 4 alone?</td>
<td>Alt 4 and Alt 5 were discussed together as the impacts are similar. Will modify text to discuss alternatives independently.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>When will we know if there is a need for temporary Linder Road closures as indicated in the text? This would be good to use as a part of the vetting process to rule out / in alternatives proposed.</td>
<td>The Middle Channel presents a concern with the elevation difference between the existing structure and the proposed structure. The implications to the construction staging will be evaluated with the Bridge Alternate Study.</td>
<td></td>
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<tr>
<td>10</td>
<td></td>
<td>Show the typical sections for all proposed alternatives to be carried forward and correlate it to the text from page 1 to 10.</td>
<td>Agree. Will add the typicals to the text in the revised document.</td>
</tr>
<tr>
<td>Appendix – Page 18</td>
<td>In reviewing the typical sections I don’t see an alternative where we develop an interim rural section and ultimately build out an urban section. Granted, I could be missing it in the contents of the document. If this wasn’t identified as an alternative I think it would be good to consider that as an option. I know this was discussed in prior meetings. I also understand this could make drainage a challenge, but feel its important to push through the analysis process as it’s coincident to the recommendations outlined in the TIS (5 interim / 7 ultimate)</td>
<td>Agree. All alternatives presented transition to an “ultimate 7 lane” urban section. An urban section will be required to accommodate the drainage for a seven lane roadway section.</td>
<td></td>
</tr>
<tr>
<td>Roll plots</td>
<td>Use ACHD standards for line types, line styles, alignment, profile, etc. This appears to be done to ITD standards. The standards are available here, Ada County Highway District. They are close to our CADD standards.</td>
<td>Agree will revise.</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>I take a closer look at the horizontal and vertical once the 3 highest ranked alternatives are brought forward. One thing that caught my eye is that running slope can’t be less than 0.4 %, make sure that is addressed with the final 3 alternatives.</td>
<td>The only locations with a grade of less than 0.4% exist at the structure locations. As discussed in the 10/2 meeting these structures will be modified to show a 0.3 % grade.</td>
<td></td>
</tr>
<tr>
<td>Traffic Memorandum</td>
<td>Are you positive you can’t change the Saturation Flow Rate?</td>
<td>Yes.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E – December 3 PIM Plan View Exhibits
Linder Road, Chinden Blvd (US 20/26) to SH-44

SHARED PATHWAY

Alternative A Proposed Right-of-Way
Alternative B Proposed Right-of-Way

Legend:
- Proposed Pavement/Sidewalk
- Proposed Bridge
- Existing Property Line/Right-of-Way
- Proposed Right-of-Way (Alternative A: Five Lanes to Seven Lanes with Shared Pathway)
- Proposed Right-of-Way (Alternative B: Five Lanes Only with Shared Pathway)
Linder Road, Chinden Blvd (US 20/26) to SH-44

SHARED PATHWAY

December 3, 2018

Match Line

LEGEND
- Proposed Pavement/Sidewalk
- Proposed Bridge
- Existing Property Line/Right-of-Way
- Proposed Right-of-Way (Alternative A: Five Lanes to Seven Lanes with Shared Pathway)
- Proposed Right-of-Way (Alternative B: Five Lanes Only with Shared Pathway)
Appendix F – Plan and Profile Sheets for Preferred Alternative
CONCEPTUAL DESIGN
PREFERRED ALTERNATIVE

LINDER ROAD
CHIDEN BLVD (US 20/26) TO SH 44
CONCEPT STUDY

NOTES

LEGEND

PROPOSED BRIDGE
EXISTING PERMANENT EASEMENT
CONSIDERATIONS
IMPACTS AND DESIGN

PROPOSED EOP
PROPOSED SIDEWALK
PROPOSED CUT SLOPE
PROPOSED FILL SLOPE
PROPOSED RIGHT OF WAY
PROPOSED EDGE OF SHOULDER
PROPOSED CURB AND GUTTER

PREFERRED ALTERNATIVE
CONCEPTUAL DESIGN

157+00 158+00 159+00 160+00 161+00 162+00 163+00 164+00 165+00 166+00 167+00 168+00 169+00 170+00 171+00 172+00 173+00 174+00 175+00 176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00 184+00 185+00 186+00 187+00

Ada County Highway District
375 Adams Street, Boise, Idaho 83714
www.achdidaho.org

Design By:
J HUNTING / H CARTER

Date: Mar. 2019

Drawn By:

Project Name: LINDER ROAD, CHIDEN BLVD (US 20/26) TO SH 44
Project Number: 518020

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