



CITY COUNCIL MEETING STAFF REPORT

Meeting Date: April 19, 2021	Subject: Resolution No. 2890 Authorizing City Staff to proceed with the recommended design of the Boeckman Dip project. Staff Member: Dominique Huffman, PE, Civil Engineer & Nancy Kraushaar, PE, Civil Engineer Department: Community Development	
Action Required	Advisory Board/Commission Recommendation	
<input checked="" type="checkbox"/> Motion <input type="checkbox"/> Public Hearing Date: <input type="checkbox"/> Ordinance 1 st Reading Date: <input type="checkbox"/> Ordinance 2 nd Reading Date: <input checked="" type="checkbox"/> Resolution <input type="checkbox"/> Information or Direction <input type="checkbox"/> Information Only <input type="checkbox"/> Council Direction <input type="checkbox"/> Consent Agenda	<input type="checkbox"/> Approval <input type="checkbox"/> Denial <input type="checkbox"/> None Forwarded <input checked="" type="checkbox"/> Not Applicable Comments: N/A	
Staff Recommendation: Staff recommends Council adopt Resolution No. 2890.		
Recommended Language for Motion: I move to approve Resolution No. 2890.		
Project / Issue Relates To:		
<input checked="" type="checkbox"/> Council Goals/Priorities: Expand and Maintain High Quality Infrastructure	<input checked="" type="checkbox"/> Adopted Master Plan(s): Transportation System Plan Project UU-01	<input type="checkbox"/> Not Applicable

ISSUE BEFORE COUNCIL:

Staff will update Council on the Boeckman Dip Bridge Project work, provide a design alternative recommendation, and request Council authorization to proceed with design of recommended alternative.

EXECUTIVE SUMMARY:

Background:

The City of Wilsonville has explored alternatives and established a range of costs associated with widening and improving the steep slopes of Boeckman Road between Canyon Creek Road and Stafford Road. The project is prioritized in the Wilsonville Transportation System Plan (TSP) as Project UU-01 and will provide safe bicycle and pedestrian facilities that connect residential neighborhoods, jobs, schools, and commercial land uses. The alignment will improve sight distances through the area, particularly at the Canyon Creek Road intersection, which will be signalized once the Boeckman Dip project is complete. The project will also provide space under Boeckman Road for wildlife passage and the Boeckman Creek Trail, another TSP project (Projects RT 01A, 01B, and 07).

The scope of the Boeckman Dip project has been refined over time and the City utilized professional engineering services to complete detailed studies for project alternatives and impacts. For additional information about the project background and work completed to date see **Attachment 1**.

Update:

Staff last came to council for the Boeckman Dip project in April 2020 to discuss alternative delivery methods, fish passage, environmental permitting assumptions and the hydraulic/hydrologic study.

Since the last council meeting, staff met with environmental permitting agencies and completed additional environmental assessment to further inform the bridge alternative analysis and to study a new embankment alternative. A summary of the work since completed and Staff's recommendation is detailed below.

The "**Boeckman Dip Alternative Analysis Memorandum – Embankment**" completed by DOWL in 2020/2021 explores an embankment alternative for two construction staging options, full road closure and on-site detour. The memo additionally evaluates environmental permitting fish passage requirements for both the bridge and embankment alternatives.

The analysis determined that all proposed project alternatives will trigger fish passage requirements and all project alternatives now result in replacement of the existing culvert and flow control structure with a fish passable culvert or removal of the culvert completely and re-establishment of the creek bed. With the removal of the flow control structure, staff has initiated the Hydraulic and Hydrologic Study to better understand the potential impacts and mitigation options for altering the flow of Boeckman Creek.

The "**December 2019 Boeckman Dip Bridge Alternative Analysis Memorandum – Addendum #1**" completed by DOWL in 2020/2021 updates the bridge alternative analysis to account for fish passage requirements and revises the environmental permitting assumptions consistent with the embankment alternative study.

In February 2021, DOWL completed the “**Boeckman Dip Studies – Comprehensive Executive Summary**” document, found in **Attachment 2**, to provide one document that sums up the technical memoranda completed for the project over the past two years and applies the latest design assumptions. Two main alternatives to raise the roadway and cross Boeckman Creek are summarized in the comprehensive executive summary and include:

- 1) a bridge structure, and
- 2) an embankment.

For both alternatives, two options are considered for managing traffic on Boeckman Road during construction and include:

- a) fully closing Boeckman Road during construction and establishing a designated detour route, or
- b) establishing a temporary on-site detour (a temporary road), constructed adjacent to the existing roadway (a full road closure is required for certain construction activities).

The **Boeckman Dip Studies – Comprehensive Executive Summary** outlines each alternative based on key considerations including cost, construction duration, closure duration, right of way acquisition, tree removal, and the level of environmental risk.

Staff carefully evaluated all options presented in the technical memoranda based on the considerations listed above, as well as how each alternative could best achieve City/project goals. Below is a summary of the key considerations

Embankment Alternative – This alternative raises the roadway with fill and replaces the existing culvert with a new fish passable culvert. Additional culverts (tunnels) are included for the regional trail and wildlife passage.

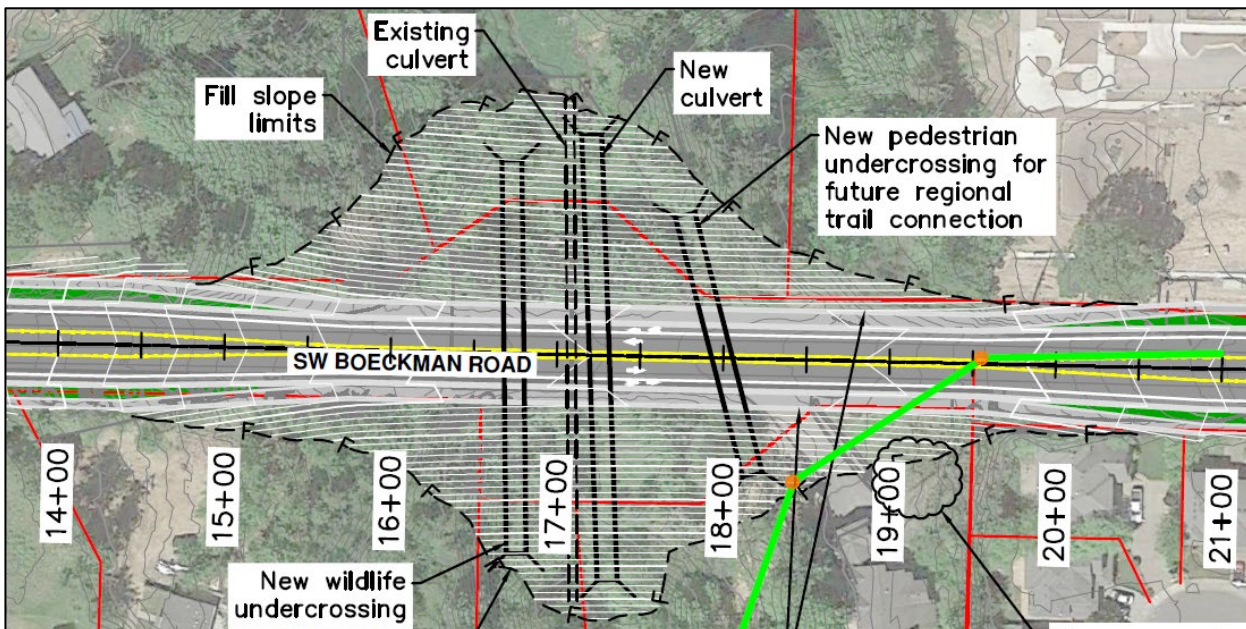


Figure 1: preliminary design of the embankment alternative, including culvert and tunnels

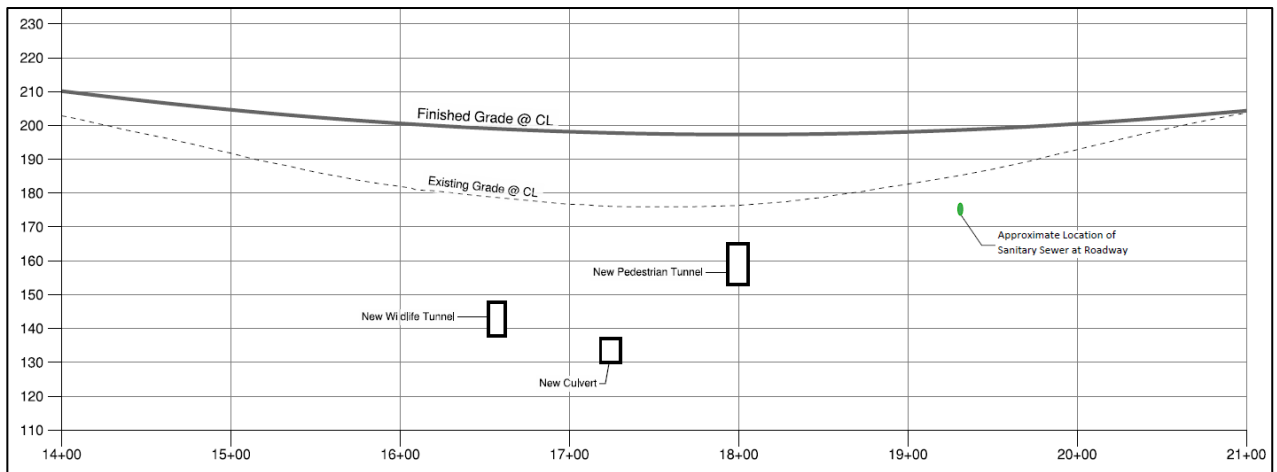


Figure 2: profile of the road and approximate locations of the culvert and tunnels

Key findings from the embankment analysis include:

- Larger footprint requiring more right of way and more tree removal
- 180 foot long trail tunnel (12 foot by 12 foot) that does not currently include safety features or other enhancements such as lighting or ventilation.
- 240 foot long wildlife tunnel that, other than minimally raising the height of, cannot be reasonably improved.
- Inadequate access path for Public Works and Parks who will be maintaining the trail, culvert, sanitary sewer line, storm sewer, and tunnels.
- High risk environmental permitting that may require a wider creek culvert or other modifications like daylighting to provide adequate fish passage. These alterations would increase the estimated cost.
- Longer construction duration, 20 months.
- Lower cost however any modifications to improve safety or user experience would increase the cost and construction duration of this alternative.

Bridge Alternative - This alternative removes the existing culvert and flow control structure and spans the re-established creek with a bridge that is approximately 340 feet long.

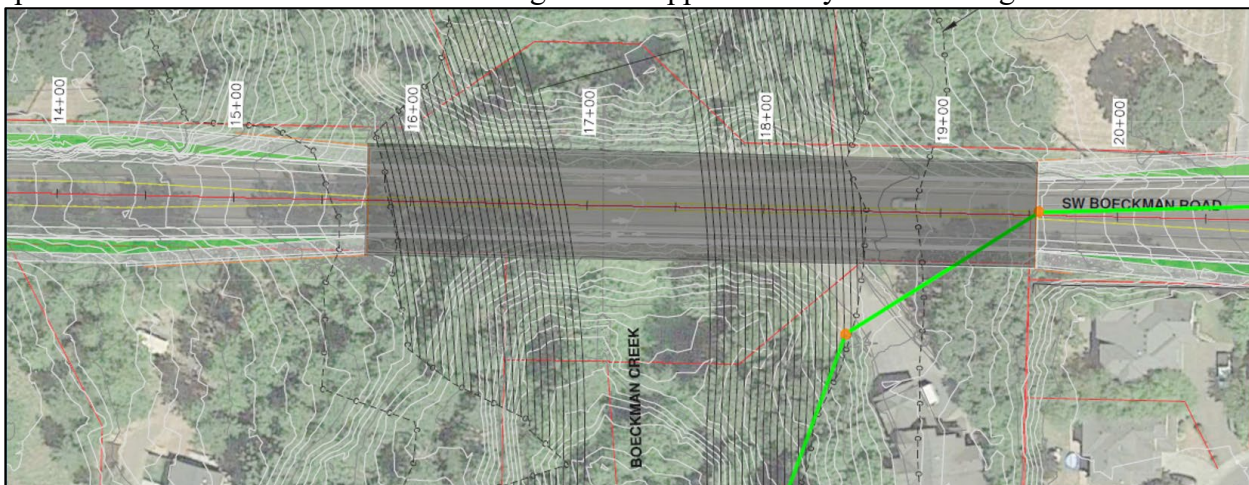


Figure 3: preliminary design of the bridge alternative

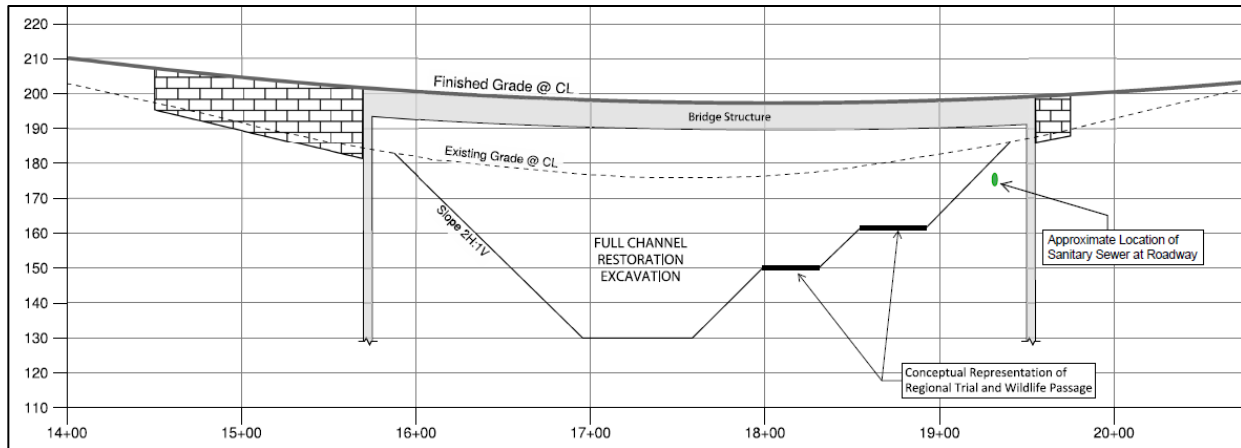


Figure 4: profile of the road and conceptual representation of the creek, regional trail and wildlife path

Key findings from bridge analysis include:

- Smallest footprint and the least impact to neighboring properties. Additionally, the fewest number of trees will need to be removed to construct this alternative.
- Provides the safest and most user friendly options for pedestrian and wildlife passage by opening up the space between the road and the creek.
- Provides access for Public Works and Parks departments to sufficiently maintain the trail, sanitary sewer line, storm sewer and creek.
- Allows the creek bed to be re-established.
- Preferred design by environmental permitting agencies and has the lowest risk for obtaining the permits necessary to construct needed improvements over the creek.
- Shortest construction duration, 15 months.

On-Site Detour - Regardless of the design alternative, Boeckman Road must be closed for some duration of time to construct transitions between the existing roadway and the new roadway. Alternatives for managing traffic during construction were assessed to determine how long the road would need to be closed if an on-site detour was constructed 60 feet to the north of the existing road for both the bridge and embankment alternatives (a previous evaluation determined a southern detour was not viable and staged construction was not recommended due to increased cost). Based on the preliminary construction staging design, both the bridge and embankment alternatives on-site detour have a similar footprint and associated impacts. The temporary road includes a narrow road with one lane of traffic in each direction and one pedestrian path. The temporary road would require the existing culvert to be extended and a temporary retaining wall and with fill material placed to build the temporary detour.

A preliminary design of a northern on-site detour is shown below. Also shown is “North On-site Detour Section A-A” and photo of temporary road detour impact area.

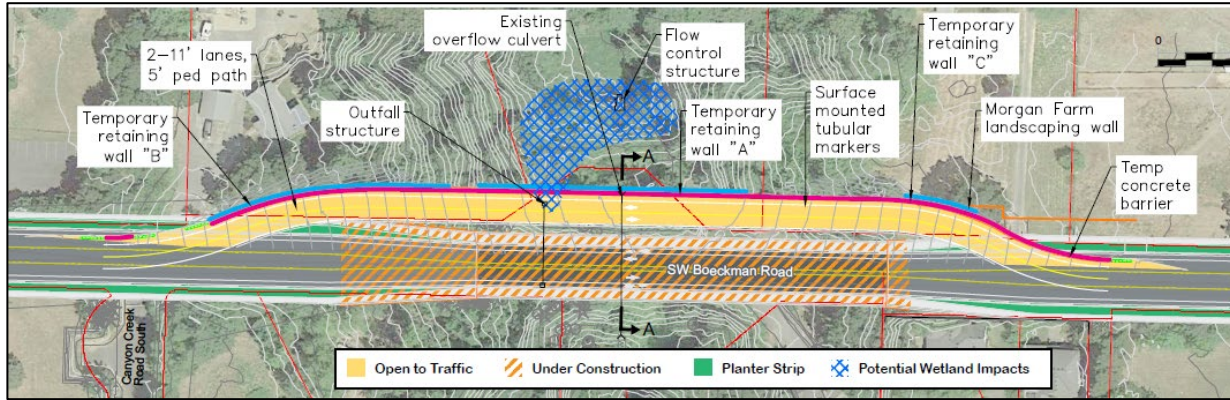


Figure 5: Preliminary design of northern on-site detour, shown with the bridge alternative:

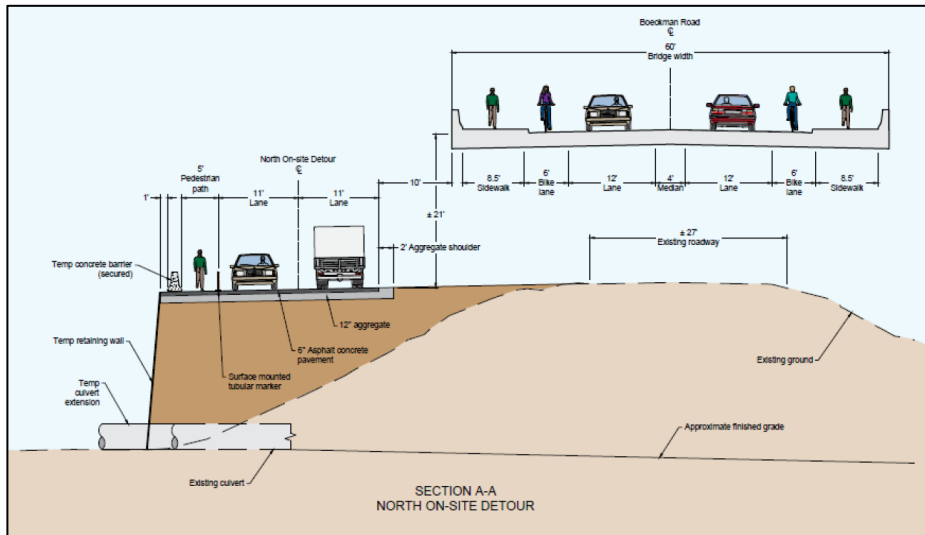


Figure 6: Cross section of on-site detour looking east

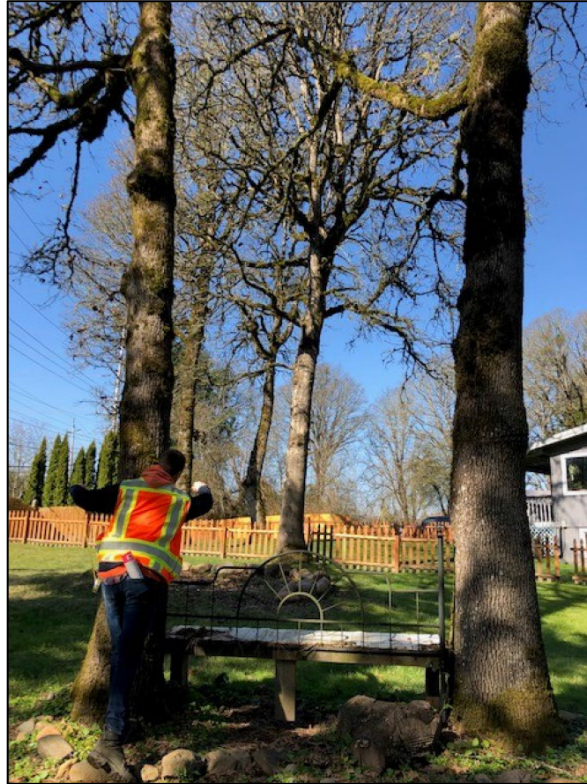


Photo 1: On-Site Detour Area

Key findings from the on-site detour analysis include:

- Safety concerns placing the live traffic on a temporary road next to the active construction area.
- Speed reduced to 25mph (currently 40mph) for the on-site detour.
- The on-site detour adds almost a year to the construction duration.
- Full road closure is still required for portions of the work.
- More right of way acquisition is required and many more trees would be removed including a number of well-established Oregon White Oaks, Douglas Firs and Big Leaf Maples
- High environmental risk due to extending the existing culvert to accommodate the extra fill and retaining wall needed to hold the temporary road. The assumption that the existing culvert can be extended would be verified during design and future coordination with environmental permitting agencies. If permitting agencies determine additional mitigation is required (i.e. wetland) or if a different creek crossing method is required (i.e. temporary bridge structure) significant cost could be added to this alternative, roughly estimated at \$2 million.
- The on-site detour sub-alternatives do not provide a long term benefit to the City.

Alternatives Summary:

Alternative		Cost	Construction Duration	Closure Duration	ROW Acquisition	Environmental Risk
Bridge	On-Site Detour	\$22.8M	24 months	5 months	41,300 sq. ft.	MEDIUM HIGH
	Road Closure	\$20.7M	15 months	15 months	22,500 sq. ft.	LOW
Embankment	On-Site Detour	\$18.8M	33 months	15 months	56,700 sq. ft.	HIGH
	Road Closure	\$16.9M	20 months	20 months	33,500 sq. ft.	MEDIUM

Recommendation:

After thorough and exhaustive analysis of the many alternatives, Staff recommends the bridge structure to raise the roadway across Boeckman Creek with a full-road closure. This option limits impacts, balances the safety and convenience of the community as a whole and provides the best scenario for obtaining state agency environmental permits that are necessary to cross the creek. The cost for the project is currently estimated at \$20.7 million.

Staff does not recommend proceeding any further with the design of the embankment alternative. It was beneficial to assess the embankment alternative to determine if it was a viable less costly option. However, upon evaluation this alternative has many disadvantages and higher risks. Costly modifications could make the embankment alternative come closer to meeting the project needs however it would bring the cost close to the bridge cost, which far exceeds the benefits of the embankment alternative.

Staff does not recommend proceeding with the on-site detour traffic staging alternative. With a full road closure required for any alternative, the additional time to construct the on-site detour, the significantly higher impacts to the neighboring properties, and the higher risk for permitting do not justify the added cost.

Future Discussion/Next Steps:

The project is currently underfunded by approximately \$6 million. Staff is evaluating a number of options to fill the gap in bridge project funding and will present a project funding strategy at a future council meeting.

EXPECTED RESULTS:

Once Council authorizes Staff, they will proceed with the design of the recommended alternative, a bridge structure over Boeckman Creek with a full road closure. Staff will then present to council the proposed funding strategy for discussion and direction.

TIMELINE:

Once council authorizes the design of the recommended alternative and agrees with the proposed funding strategy, Staff will determine if an alternative project delivery method is beneficial and will proceed with soliciting proposals for either an owner’s representative or engineering design team to begin 30% design. Once this critical milestone is achieved, environmental permitting and right-of-way acquisition can begin and a construction schedule can be established.

CURRENT YEAR BUDGET IMPACTS:

The approved FY 2020/2021 budget includes \$2,600,000 in Year 2000 Urban Renewal District funds for project design, construction and overhead associated with the Boeckman Dip Bridge project (CIP #4212). The project is intended to be designed jointly with the Boeckman Road Street Improvements – Frog Pond Project (CIP #4205), the Canyon Creek/Boeckman Traffic Signal Project (CIP # 4206), and the Boeckman Road Sanitary Sewer Improvements – Frog Pond (CIP # 2102). The Boeckman Creek Stormwater Study (CIP #7065) is a companion project currently underway and funded by the approved FY 2020/2021 budget split evenly between the storm SDCs and storm operating funds, totaling \$90,800.

FINANCIAL REVIEW / COMMENT:

Reviewed by: CAR Date: 4/9/2021

Funding available from Year 2000 Urban Renewal District will not cover the entire cost of this project. Other sources will need to be identified in order to complete this project.

LEGAL REVIEW / COMMENT:

Reviewed by: BAJ Date: 4/14/2021

The Project will result in a \$1,079.00 increase per door to the Frog Pond Infrastructure Fee, as was addressed in the Frog Pond Development Agreement.

COMMUNITY INVOLVEMENT PROCESS:

A community involvement process will be defined and incorporated into the work scope for further project design work. Preliminary public outreach occurred when the Year 2000 Urban Renewal Plan was amended to include construction funding for the project. The Project has been discussed with the community as the Frog Pond neighborhood was planned and as land use applications have been approved. The community also had the opportunity to learn about the Project during the Transportation System Plan adoption process.

POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:

The adopted Wilsonville Transportation System Plan includes the Boeckman Road Dip Improvements as a high priority to replace the existing road. Widening to accommodate bike lanes and sidewalks, updating the vertical profile to meet Public Works standards and improving sight distance are all necessary to provide sufficient transportation infrastructure and safe and accessible connections that will benefit the existing community. The Project will also provide adequate space for the Boeckman Creek trail and wildlife passage under Boeckman Road.

ALTERNATIVES:

Numerous alternatives have been considered for the Boeckman Dip project. Staff has presented them as well as the recommended design alternative to Council for their consideration.

CITY MANAGER COMMENT:

N/A

ATTACHMENTS:

1. Project Background
2. Boeckman Dip Studies – Comprehensive Executive Summary
3. Resolution No. 2890

ATTACHMENT 1

April 19, 2021 Wilsonville City Council Work Session

Project Background:

The proposed “Boeckman Dip” project will upgrade a section of Boeckman Road that was constructed in the 1960s according to USGS mapping records. At that time the road was straightened from its previous switchback alignment, and a large corrugated metal pipe (CMP) culvert was installed to convey creek flows.

Boeckman Road, one of three east-west cross-town arterials in Wilsonville, serves an important role in the City’s transportation system; becoming even more important as the Frog Pond neighborhoods build out. The project, included in the Wilsonville Transportation Plan (TSP) as Project UU-01, will upgrade the existing steep and narrow rural roadway alignment to urban standards, and assumes a bridge would be used to achieve project goals. The project will provide safe bicycle and pedestrian facilities that connect residential neighborhoods, jobs, schools, and commercial land uses. The alignment will improve sight distances through the area, particularly at the Canyon Creek Road intersection, which will be signalized in the near future, and remove the barrier that the steep road creates for bicycles. The project will also provide for wildlife passage under Boeckman Road.

The TSP also includes the Boeckman Creek Trail (Projects RT 01A, 01B, and 07), a north-south trail through east Wilsonville that follows Boeckman Creek and will ultimately extend all the way from the Frog Pond neighborhoods to Memorial Park. The Boeckman Dip project work scope has to date assumed the existing access/maintenance road north of Boeckman Road will remain but will be relocated to the east. Staff recommends the project also address how a future Boeckman Creek Trail alignment can best be accommodated within the project reach.



Project Location

Over time, the Boeckman Creek basin was significantly altered not only by urban development within the basin but possibly more importantly by modifications to its natural basin boundaries. Substantial drainage areas were added and out-of-basin flows were diverted to the Boeckman Creek basin. These areas are north and west of Boeckman Road including Mentor Graphics up to and including Argyle Square.

Designed to address and manage these out of basin flows in order to protect against flooding and the overall integrity of Boeckman Creek, the main creek culvert is enhanced with flow control infrastructure as illustrated in the photos below. These include a benched embankment on the north (upstream) side of the Boeckman Road with an emergency overflow culvert; a main culvert and flow control structure at the creek level; and an inundation easement. Comparative elevations are:

Boeckman Road surface at low point: elevation = 176+/- feet

Upper bench and emergency overflow culvert: elevation = 154+/- feet

Main culvert near base of flow control structure: elevation = 140+/- feet



Main Large Corrugated Metal Pipe (CMP) Culvert conveys creek flows under the Road



North to South View from Boeckman Creek up to Boeckman Road – Shows flow control structure for culvert and creek level, upper bench and road (see car)



Emergency Overflow Culvert (42"x66" CMP - Corrugated Metal Pipe) Located on Upper Bench



Profile from Road to Upper Bench



Upper Bench Looking Down at Creek and Flow Control Structure

Preliminary engineering work completed to develop the project scope, include:

- The OBEC Consulting Engineers (OBEC) **May 2014 “Boeckman Dip Planning Design Narrative for Frog Pond Master Plan”** that explored alignments and developed costs for two bridge options; “Option A” – a 305-foot long with a 6 percent maximum grade and “Option B” – a 432-foot long bridge with a 3.5 percent maximum grade. Both assumed full road closure during construction and removing the roadway embankment fill down to the upper level bench and emergency overflow culvert.
- The DOWL (formerly OBEC) **December 2019 “Boeckman Dip Alternative Analysis Memorandum”** that explored costs, permitting, and right-of-way implications for three construction detour alternatives and updated the full road closure. The “Option A” bridge is lengthened to 380 feet for all alternatives to preserve a significant tree at 7550 Boeckman Road. This memorandum also took a preliminary look at a bridge option where existing embankment would be removed to allow for the main culvert removal.

The memo concluded the full road closure remained the preferred option based on cost, contractor constructability, construction duration, tree removal, and environmental impacts; but that Alternative 1 (the north-side temporary road detour) was preferred (based on the same criteria) over the two others evaluated should the City rule out the full road closure. It was also determined that the road would need to closed for a duration of time in any scenario.

- DKS Associates **June 2019 “Wilsonville Boeckman Road Dip Detour – Traffic Study”** that evaluated the effect a full road closure and the associated traffic diversion would have on the rest of the transportation system and concluded that impacts to the majority of the study intersections are minor and can support the temporary diversion of PM peak hour traffic volumes from Boeckman Road with the exception of the Stafford Road/65th Avenue/Elligsen Road. This location fails under existing (2019) conditions as well as with full closure detour conditions. A temporary traffic signal to relieve congestion at these intersections would help mitigate the impacts of the Boeckman Road closure. These intersection are under both Clackamas County and Washington County jurisdiction and the signal requires their approval. Staff is currently working with both agencies to advance a temporary signal design.
- The preliminary tree inventory covered trees greater than 6 inches in diameter in an area 70 feet north of Boeckman Road on the west side of the dip. It found 7± Oregon Oak trees, 6± Douglas-Fir, 10± Big Leaf Maple, 10± Red Cedar, 1± Pine, and 20± Red Alder. Most of the trees, with only a few exceptions, located within this area were in relatively good condition.
- Pacific Habitat Services, Inc (PHS) **March 2020 “Fish Passage Assessment for the Boeckman Dip Crossing on Boeckman Road, Wilsonville”** reported Boeckman Creek provides habitat for cutthroat trout both upstream and downstream of the crossing and habitat for rainbow trout/steelhead and Chinook salmon downstream of the crossing. It was determined that fish could reach the crossing and that the existing culvert and flow

control structure are considered fish barriers. It concluded that environmental permitting agencies could reasonably require fish passage at the Boeckman Dip Crossing if project work warranted.

- Further discussion with Oregon Department Fish and Wildlife (ODFW) provided the project elements that would trigger a fish passage requirement. A fish passage requirement will likely involve removing the flow control structure that was constructed to manage the drainage from out-of-basin flows diverted to the Boeckman Creek Basin from the Coffee Creek Basin. A hydraulic/hydrologic study would then be needed to evaluate the impacts of flow modifications to Boeckman Creek.

Project engineering work to be discussed at the April 19, 2021 Council Work Session:

- **DOWL February 2021 “Boeckman Dip Alternative Analysis Memorandum – Embankment”** explored an embankment alternative for two construction staging options, full road closure and on-site detour. The memo additionally evaluated environmental permitting fish passage requirements for both the bridge and embankment alternatives and concluded all project alternatives trigger fish passage requirements.
- **DOWL February 2021 “December 2019 Boeckman Dip Bridge Alternative Analysis Memorandum – Addendum #1”** updated the bridge alternative analysis to account for fish passage requirements and revised environmental permitting assumptions (providing consistency with the embankment study).
- **DOWL February 2021 “Boeckman Dip Studies – Comprehensive Executive Summary”** provided one document that combines all the technical memoranda completed for the project over the past two years and applies the latest design assumptions. Two main alternatives to raise the roadway and cross the creek are summarized in the comprehensive executive summary and include a bridge structure and an embankment. Traffic options were considered during construction and included fully closing the road during construction with traffic following a designated detour route or constructing a temporary on-site detour (a temporary road) and routing traffic around Boeckman Road when construction activities allow (a full road closure is required for certain construction activities).

Project engineering work that is underway:

- Brown and Caldwell (B&C) – Anticipated **September 2021 “Boeckman Road Improvements – Hydraulic Evaluation”** evaluating the hydraulic impacts of the proposed Boeckman Road improvements and associated modifications in the Boeckman Creek basin, including removal of the existing flow control structure and culvert at Boeckman Road.



ATTACHMENT #2 MEMORANDUM

TO: City of Wilsonville
 BY: Bob Goodrich, P.E.
 REVIEWED BY: Nick Robertson, P.E., S.E.
 DATE: February 2021
 SUBJECT: Boeckman Dip Studies – Comprehensive Executive Summary

Since at least 2014 the City of Wilsonville (City) has been studying alternatives to widen and improve the vertical alignment of Boeckman Road between Canyon Creek Road and Stafford Road (Boeckman Dip). Over the past six years some assumptions and project objectives have changed, which affects previous studies' analyses and conclusions. This memorandum synthesizes the following studies into a set of findings and recommended next steps (Table 1):

Study	Focus of the Study
Planning-level layout of a new bridge (DOWL, 2014)	Evaluated two bridge layouts to replace the overflow culvert and remove fill to the intermediate terrace. No work was considered below the overflow culvert and terrace.
Bridge construction traffic analysis and staging (DOWL & DKS, 2019)	Evaluated staging layouts to construct the bridge and road closure traffic impacts. Briefly considered removing most of the embankment below the overflow culvert.
Fish passage assessment (PHS, 2020)	Completed a fish passage assessment of the existing culvert.
Existing culvert condition assessment (AIMS Companies, 2020)	Conducted a condition assessment of the existing culvert.
Planning-level layout of embankment options (DOWL, 2020)	Evaluated two embankment layouts to replace both the primary and overflow culvert with new culverts and confirmed fish passage requirements are likely triggered for any bridge or embankment alternative studied.

Table 1 – Prior Studies

Due to assumptions that have changed in the last six years, some of the costs, durations, findings, and recommendations herein will not be consistent with the findings of the previous studies. The formative project findings that inform the major decisions of structure type (bridge versus culvert) and traffic staging (on-site detour versus road closure) include:

- Boeckman Creek's active channel width (ACW) is approximately 12 feet
- Fish passage requirements are likely triggered for any of the proposed alternatives
- Boeckman Creek receives hundreds of acres of out-of-basin runoff upstream of this site
- Replacing the culvert and removing the flow control structure will affect downstream flows

MEMORANDUM

- A detailed hydraulic analysis is necessary to evaluate downstream flood risks and detrimental impacts to Boeckman Creek
- Closing Boeckman Road results in only minor impacts along anticipated detour routes except at the Stafford Road-65th Avenue intersection, which requires a temporary signal

The previous studies considered several bridge alternatives, culvert and embankment alternatives, and multiple ways to stage or detour traffic. Through that process, many alternatives were eliminated from consideration. Related to structure types, alternatives no longer under consideration are rehabilitation of the existing culvert and the previous alternative of a bridge which spans only the overflow terrace – because neither of these alternatives are likely to be permitted. Related to traffic staging, alternatives no longer under consideration are an on-site detour south of Boeckman Road and one-lane, two-way staged construction.

Table 2 on the next page summarizes the structure type and traffic staging alternatives still under consideration compared across three criteria. The information provided in Table 2 is based on the best available information but is subject to change as the project advances. The alternatives and the criteria are briefly described below:

Structure Type Alternatives

New bridge: This alternative will remove the existing culverts and flow control structure, reestablish the ACW by removing existing embankment material to the elevation of the flow control structure, and construct a bridge while improving the vertical profile of the road. The bridge will accommodate wildlife passage and a future regional trail. Retaining walls will reduce the bridge length, limit property impacts, and protect trees to the extent practical. Based on a cursory analysis of the new channel section, the western abutment of the bridge can be moved approximately 40 feet to the east, which will result in an overall bridge length of 340 feet. The costs in this summary reflect this change from the previous study.

New culvert: This alternative will remove the existing culverts and flow control structure, reestablish the ACW, and install a new culvert that meets fish passage requirements while improving the vertical profile of the road. Two additional reinforced concrete box culverts will also be installed to accommodate wildlife passage and pedestrian access for a future regional trail. Retaining walls will limit property impacts and protect trees to the extent practical. This alternative is considered a minimum cost alternative that meets the overall project goals. Compared to the bridge it may result in increased levels of permitting risk and a lower overall benefit for trail users, maintenance staff, and fish and wildlife.

Traffic Staging Alternatives

On-site detour: This traffic staging scenario will construct a temporary road north of Boeckman Road using fill, a culvert extension, and retaining walls. A full road closure will be necessary to complete the roadway widening at the tie-in points east and west of the dip.

Full road closure: This traffic staging scenario will close Boeckman Road during construction. Traffic will be detoured to Elligsen Road and/or Wilsonville Road for most of the construction.

Criteria

Cost: Project costs, in 2023 dollars, include construction, preliminary and construction engineering, a 40% contingency, a 2% aesthetics allowance, and right-of-way (ROW) acquisition. Inflation should be applied based on the anticipated year of construction.

MEMORANDUM

Durations: Two durations are presented: total construction time and the length of time Boeckman Road will be closed. Durations are instructive for comparing alternatives but are subject to change as design progress.

Impacts: Approximate property and tree impacts are presented. Natural resource impacts are not quantified since there is little differentiation and all alternatives result in long-term benefits.

		Cost*	Construction Duration	Closure Duration	Property Impacts	Tree Impacts
Bridge	On-Site Detour	\$22.8M	24 months	5 months	41,300 sq. ft.	130 trees
	Road Closure	\$20.7M	15 months	15 months	22,500 sq.ft.	120 trees
Embankment	On-Site Detour	\$18.8M	33 months	15 months	56,700 sq. ft.	135 trees
	Road Closure	\$16.9M	20 months	20 months	33,500 sq. ft.	125 trees

*Costs do not match those in previous reports. Table 2 costs are presented in 2023 dollars and include shortening the bridge structure by 40'.

Table 2 – Comparison Matrix

Based on these findings, our recommendation for traffic staging is to close the road during construction. The closure saves money, reduces impacts, and shortens construction. Detoured traffic has feasible alternative routes that do not result in significant delay.

Our recommendation for structure type is not as definitive and needs to consider both qualitative and quantitative (see Table 2) measures. The embankment alternative is the least cost alternative that meets the goals of improving the vertical profile of Boeckman Road, providing a wildlife and pedestrian undercrossing, and addressing fish passage requirements. Based on the preliminary evaluations the bridge alternative may cost up to 20% more than the embankment alternative. However, in addition to longer construction and road closure durations, greater property impacts and more tree removal, the embankment alternative includes several disadvantages to the bridge, including:

- Increased risk that permitting agencies will not approve of the final design of a 12-ft wide culvert. This would result in a project cost increase.
- Compared to an open channel, a new culvert would limit the ability to mitigate downstream hydraulic impacts within the current project footprint. This could increase impacts and project cost.
- The proposed 180-ft long pedestrian tunnel will not provide the same trail experience for users. This reduces user safety and could decrease the number of citizens using this recreational amenity.
- The proposed 240-ft long wildlife tunnel will not provide the same level of environmental benefit. This could limit the number and size of wildlife that uses the tunnel.

MEMORANDUM

- Maintenance access on the south side of the embankment will be limited by the 12x12 tunnel. This could restrict specific maintenance activities or increase project costs to accommodate those activities

Addressing any of these disadvantages would decrease the price difference between the bridge and embankment alternatives.

Moving forward, there are still unknowns and unverified assumptions that could affect the project scope and budget. Most notably is the need to complete a downstream analysis, regardless of the preferred alternative. If that analysis determines there are adverse effects to downstream properties, there will be additional project costs and impacts to mitigate those effects.

Pending City Council approval of funding, it is recommended to proceed with completing a comprehensive 30% design that verifies assumptions and resolves unknowns to position the project for final design, permitting, and right-of-way acquisition.

RESOLUTION NO. 2890

A RESOLUTION OF THE CITY OF WILSONVILLE AUTHORIZING STAFF TO PROCEED WITH THE RECOMMENDED DESIGN FOR THE BOECKMAN DIP PROJECT.

WHEREAS, the Boeckman Dip project (the Project) is included in the City's adopted Transportation System Plan and Comprehensive Plan; and

WHEREAS, the City has planned and budgeted for the Project under CIP #4212; and

WHEREAS, the City has utilized professional engineering services from DOWL, LLC. to provide planning level design alternatives, cost estimates, and relative impacts for each design alternative; and

WHEREAS, the City evaluated each alternative with respect to cost, construction duration, detour options and road closure duration, right of way acquisition, environmental risk, tree removal, traffic impacts, safety, and ability to meet project goals; and

WHEREAS, the bridge alternative has the smallest project footprint and least impact to neighboring properties, requiring the least amount of right of way acquisition and impacting the fewest number of trees; and

WHEREAS, the bridge alternative provides the safest and most user friendly options to accommodate regional trail and wildlife passage; and

WHEREAS, the bridge alternative provides the necessary access to maintain the sanitary and storm sewers, future trail, and creek; and

WHEREAS, the bridge alternative with the full road closure has the lowest amount of risk for obtaining environmental permits with the current design assumptions; and

WHEREAS, the bridge alternative with a full road closure can be constructed in the shortest amount of time; and

WHEREAS, the bridge alternative with a full road closure limits impacts, balances the safety and convenience of the community as a whole and provides the best scenario for obtaining state agency environmental permits that are necessary to cross the creek.; and

WHEREAS, the bridge alternative with full road closure is the recommended alternative.

NOW, THEREFORE, THE CITY OF WILSONVILLE RESOLVES AS FOLLOWS:

1. The evaluation of each alternative was thoughtful and exhaustive.
2. The City of Wilsonville authorizes Staff to proceed with design of the recommended bridge alternative with full road closure.
2. This resolution becomes effective upon adoption.

ADOPTED by the Wilsonville City Council at a regular meeting thereof this 19th day of April 2021, and filed with the Wilsonville City Recorder this date.

Julie Fitzgerald, Mayor

ATTEST:

Kimberly Veliz, City Recorder

SUMMARY OF VOTES:

Mayor Fitzgerald

Council President Akervall

Councilor Lehan

Councilor West

Councilor Linville