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Memo

Date:	Wednesday, May 30, 2018
Project:	Clark County NE 99th Extension Feasibility Study
To:	Gary Albrecht, Clark County
From:	Jason Ruth, Project Manager, HDR Engineering
Subject:	**Alternative Alignment Comparison Memo**

1.0 Introduction

1.1 Project Description

Clark County plans to complete development and improvements of NE 99th Street to provide a continuous minor arterial from SR503 to NE 72nd Avenue

The corridor is currently in several phase of development. These phases and their status include;

- The existing intersection at NE 99th and SR503 is nearly complete with construction.
- Improvements to NE 99th from SR503 to 105th Avenue is currently being designed by Clark County.
- Construction of a NE 99th Roadway from 105th Avenue to 94th Avenue is currently being designed by Clark County.

The corridor currently contains a missing link between NE 87th Avenue to NE 72nd Avenue. The completion of this link would add a new east-west connection that would serve thru traffic and provide access to commercial, industrial, office and residential developments and thus relieve some of the traffic pressure on NE 119th Street to the North, NE 88th Street and Padden Parkway to the South. The extension of NE 99th from NE 87 Avenue to NE 72nd Avenue (The Project) has long been in Clark County's Transportation Plan.

1.2 Previous Work

In 2009, Clark County Commission created a study that evaluated multiple alternatives for extending NE 99th from NE 87th to NE 72nd Avenue, and then across I-205 and connecting to NE St. Johns Road. This study is attached as Appendix A.

The 2009 Study scored each alternative against agreed to evaluation criteria. The evaluation criteria can be found in Table 2, Page 13 of the 2009 Study. The ranking of each alternative against the evaluation criteria can be found in Table 4, page 16 of the 2009 Study.

The 2009 Study ultimately concluded that two alternatives should be considered for future evaluation; Alternative D and Alternative F. In general;

- Alternative D was the preferred Northern Alignment that crossed Curtin Creek and utilized existing County ROW through an existing subdivision. Alternative D also crossed Clark County Railroads track at grade and connecting into 72nd Avenue by improving NE 101St.
- Alternative F was advanced for consideration in that it followed generally the same alignment as Alternative D until the alignment turned South to avoid crossing the Clark County Railroad Tracks thus avoiding an at-grade crossing of the railroad tracks.

1.3 Corridor Development Since 2009

Since the completion of the 2009 Study, three significant developments have happened along The Project;

- In 2012, the Clark County Clean Water Program completed the Curtin Creek Enhancement Project. A project fact sheet can be found at the following link: https://www.clark.wa.gov/sites/default/files/CurtinCreekEnhancement-7-12.pdf ;
- Clark County Council removed the extension of NE 99th Street from St. Johns Road to 72nd Avenue from the Arterial Atlas.
- In 2017, the plan approval and beginning of construction of Taylor Transports Office and Shops along 101st that coincides with Alternative D. Reference Clark County Engineering Case Number 2017-00192.

Both of these developments appear to have provided some level of accommodation for The Project.

It does not appear that the County has furthered any additional analysis of The Project since 2009.

1.4 Purpose of this Memo

In 2018, Clark County received communication from the Washington Utility Transportation Commission (UTC) that UTC considers public necessity, convenience and safety when approving a new public Railroad Crossing. Current State Policy strongly discourages construction of new at-grade crossings unless no other viable alternatives exist.

Since preferred Alternative D crossed Clark County Railroad at Grade, the County felt it was prudent to reevaluate several of the alternatives studied in 2009 to determine the feasibility of a grade separation of Clark County Railroad and re-evaluate several of the alternatives evaluated in the 2009 Study.

The following alternatives from the 2009 Study will be re-evaluated in the context of providing a grade separation;

- Alternative D with an Overcrossing of Clark County Railroad;
- Alternative D with an Undercrossing of Clark County Railroad;
- Alternative F that avoids crossing Clark County Railroad and connects into 72nd South of the existing at-grade crossing on 72nd; and
- Alternative J that extends NE 99th in a direct East/ West direction and connects into 72nd immediately South of the 72nd at-grade crossing.

*Reference Appendix B for an overall plan of these alignments.

1.5 Re-Evaluation Criteria

Design for each of the alternatives was re-evaluated based on currently available information. Clark County GIS was used to establish ground contours, aerial photography, property lines, and flood plain limits.

The following criteria will be used to re-evaluate each of the alternatives defined in Section 1.4.

- Constructability
- Design Exceptions
- Bike/ Pedestrian Safety
- ROW Impacts and Cost
- Environmental Impacts and Permitting
- Cost Comparison

2.0 Design Detail

2.1 Design Criteria Common to all Alternatives

2.1.1 Basis of Design

NE 99th Street is designated as a minor arterial with a design speed of 40 MPH. Clark County Code 40.350.030 Street and Road Standards was used for design along with the AASHTO Green Book. AASHTO LRFD is to be used for structural bridge design and AREMA manuals are to be used for railroad related items.

2.1.2 Typical Section

The proposed 72’ wide section includes (2)-12 foot lanes, (1)-12 foot center turn lane, (2) – 6 foot bike lanes, (2) – 5.5 foot planter strips and (2) – 6 foot sidewalks.

2.1.3 Bike and Pedestrian Safety

Illumination is included for all alternatives to improve bike and pedestrian visibility. Alignments with minimal curves and flat profiles were sought to further improve visibility. A separated sidewalk is used on all alternatives along with 6' bike lanes.

The proposed extension of NE 99th connects into the 72nd Avenue at the West. 72nd has been improved with bike lanes and sidewalks. The NE 99 connects at the East into unimproved NE 99th which currently does not have bike lanes and a substandard sidewalk on one South Side of the road.

2.1.4 Design Constraints

All alternatives will connect into the existing NE 99th street on the east and cross the Curtin Creek wetland area using a bridge. The proposed roadway will then traverse the neighborhood on the west side of Curtin Creek either thru existing right of way set aside to the north or along the existing NE 99th street. The existing NE 99th street includes utilities easements for water, sewer and overhead power. The Clark County Regional railroad is located north of NE 99th street, running north to south and curving west to cross NE 72nd Avenue directly adjacent to the existing NE 99th street and NE 72nd Avenue intersection.

2.2 Design Features - Alternative D with Overcrossing of Clark County Railroad

2.2.1 Alignment Description

Alternative D with Overcrossing of the Railroad would utilize existing ROW thru the subdivision north of NE 99th, west of Curtin Creek. An area has been set aside from the Curtin Creek Enhancement Project for crossing Curtin Creek. Once thru the subdivision, the roadway crosses over the Clark County Regional Railroad with a bridge and connects into the Taylor Transport improvements along NE 101st St and ultimately connects to NE 72nd Ave with a signal. Reference Appendix C for the proposed plan a profile.

2.2.2 Alignment Constraints

The existing grade at 82nd Ave is lower than the corridor to the west creating a need for walls to minimize impacts to adjacent houses and stay within the ROW. To achieve a minimum 23'-6" clearance over the railroad, steep grades are necessary along with the use of approach walls to minimize impacts to the neighborhood to the east. West of the tracks, the roadway connections to the Taylor transport improvements along NE 101st St.

2.2.3 Proposed Roadway Structures

The structure over Curtin Creek is a 281-foot two-span bridge (center-to-center of abutments) with an out-to-out width of 64'-0". The superstructure consists of eight 58-inch deep precast prestressed wide-flange I-girders (WF58G) supporting an 8-inch cast-in-place deck. 25'-0" minimum approach slabs will be provided in order to mitigate the

effects of settlement. The bridge abutments are semi-integral reinforced concrete pile caps on pile foundations. MSE walls will be provided with moment slabs supporting traffic barriers along the wall supported approach roadway. The intermediate bent will be an integral reinforced concrete pile cap on pile foundations.

The structure over the railroad is a 130-foot single-span bridge (center-to-center of abutments) spanning the railroad right-of-way with an out-to-out width of 64'-0". The superstructure consists of nine 50-inch deep precast prestressed wide-flange I-girders (WF50G) supporting an 8-inch cast-in-place deck. 25'-0" minimum approach slabs will be provided in order to mitigate the effects of settlement. The bridge abutments are semi-integral reinforced concrete pile caps on pile foundations, and are skewed approximately 20-degrees. Wrap-around MSE walls will be provided with moment slabs supporting traffic barriers along the wall supported approach roadway.

2.2.4 Utility Impacts

Utility impacts are minimal. No existing utilities were identified within the existing right of way set aside.

2.2.5 Constructability

Construction around a railroad requires coordination with the railroad to ensure safety which could impact cost and schedule. To cross Curtin Creek, an area has been set aside previously for the alignment.

2.2.6 Design Exceptions

The proposed overcrossing alignment will need to tie in vertically to existing NE 82 Avenue near 10109 NE 82nd to minimize impacts to the existing homes. As a result, an 8% grade is necessary on the east approach to clear the railroad. The approach to NE 82nd avenue is on a curve to match the corridor set aside for the alignment.

2.2.7 Bike and Pedestrian Safety

Excessive grades near the railroad overcrossing create sight issues for cyclists and pedestrians. The grades also do not meet ADA standards and thus intermittent landings will be required on the grade to accommodate ADA. Also, the connection to 82nd Ave is on a curve which limits sight lines as cars approach the intersection.

2.3 Alternative D with Undercrossing of Clark County Railroad

2.3.1 Alignment Description

Alternative D undercrossing would utilize existing ROW thru the subdivision north of NE 99th and utilize area set aside across Curtin Creek. Once past the subdivision, the roadway crosses under the Clark County Regional Railroad by building a rail bridge over the roadway. The proposed roadway then connects into the Taylor Transport

improvements along NE 101st St and ultimately connects to NE 72nd Ave with a signal. Reference Appendix D for the proposed plan a profile.

2.3.2 Alignment Constraints

The existing grade at 82nd Ave is lower than the corridor to the west creating a need for walls to minimize impacts to adjacent houses and stay within the existing ROW thru the neighborhood. 17'-0" clearance under the railroad is necessary to maintain access for trucks. West of the tracks, the roadway connections to the Taylor transport improvements along NE 101st Street.

2.3.3 Proposed Roadway Structures

The structure over Curtin Creek is a 281-foot two-span bridge (center-to-center of abutments) with an out-to-out width of 64'-0". The superstructure consists of eight 58-inch deep precast prestressed wide-flange I-girders (WF58G) supporting an 8-inch cast-in-place deck. 25'-0" minimum approach slabs will be provided in order to mitigate the effects of settlement. The bridge abutments are semi-integral reinforced concrete pile caps on pile foundations. MSE walls will be provided with moment slabs supporting traffic barriers along the wall supported approach roadway. The intermediate bent will be an integral reinforced concrete pile cap on pile foundations.

2.3.4 Proposed Railway Structures

The proposed alternative for the undercrossing of Clark County Railroad would be composed of individual structures spaced adjacently to each other at a 20 ft. spacing to match the proposed tracks. Each structure would be composed of industry standard precast concrete double box beams on precast concrete caps with driven steel pilling. A center pier would be placed between the traveling lanes. The span arrangement would consist of 4 total spans with the approach spans each 33 ft. long over the spill through abutments with 2(H):1(V) slopes and each interior span crossing the roadway 38 ft. long, for a total bridge length of approximately 142 ft.

2.3.5 Utility Impacts

Utility impacts are minimal. No existing utilities were identified within the existing right of way set aside.

2.3.6 Constructability

Construction for the railroad grade separation would require a temporary shoofly track constructed on a temporary easement which would allow for the construction of the rail bridge without closing the rail line during construction. This would have an impact on cost and schedule. To cross Curtin Creek, an area has been set aside previously for the alignment.

2.3.7 Design Exceptions

The proposed undercrossing alignment will need to tie in vertically to existing NE 82 Avenue near 10109 NE 82nd to minimize impacts to the existing homes at the east and to the Taylor Transport Improvements at the west. As a result, a 6% grade is necessary on the west approach to clear under the railroad. The approach to NE 82nd avenue is on a curve to match the corridor set aside for the alignment.

2.3.8 Bike and Pedestrian Safety

The connection to 82nd Ave is on a curve which limits sight lines as cars approach the intersection.

2.4 Alternative F

2.4.1 Alignment Description

Alternative F would utilize existing ROW thru the subdivision north of NE 99th and utilize area set aside across Curtin Creek. Once past the subdivision, the roadway curves south to miss the railroad and crosses NE 99th St. with a roundabout. The roadway then transitions into a curve turning west and ultimately connecting into NE 72nd Ave with a signal. Reference Appendix E for the proposed plan a profile.

2.4.2 Alignment Constraints

The existing grade at 82nd Ave is lower than the corridor to the west creating a need for walls to minimize impacts to adjacent houses, existing right of way thru the neighborhood. Minimum curve radii must be used to fit within the existing corridor and miss the railroad.

2.4.3 Proposed Roadway Structures

The structure over Curtin Creek is a 281-foot two-span bridge (center-to-center of abutments) with an out-to-out width of 64'-0". The superstructure consists of eight 58-inch deep precast prestressed wide-flange I-girders (WF58G) supporting an 8-inch cast-in-place deck. 25'-0" minimum approach slabs will be provided in order to mitigate the effects of settlement. The bridge abutments are semi-integral reinforced concrete pile caps on pile foundations. MSE walls will be provided with moment slabs supporting traffic barriers along the wall supported approach roadway. The intermediate bent will be an integral reinforced concrete pile cap on pile foundations.

2.4.4 Utility Impacts

The proposed alignment will have minor impacts at NE 99th St with the roundabout construction. Existing power lines run along the south edge of NE 99th Street. No existing utilities were identified within the existing right of way set aside.

2.4.5 Constructability

Maintaining access along NE 99th Street while constructing the roundabout could impact cost and schedule. NE 99th Street is the only connection to NE 72nd Avenue.

2.4.6 Design Exceptions

Minimum tangent lengths cannot be achieved entering the intersection at both NE 82nd Avenue and NE 99th Street at the Roundabout. The proposed alignment into the roundabout intersection at NE 99th Street would not be perpendicular to the existing NE 99th Street.

2.4.7 Bike and Pedestrian Safety

The connection to NE 82nd Ave is on a curve which limits sight lines as cars approach the intersection. The proposed roundabout at NE 99th Street does not have adequate tangents entering the intersection possibly creating sight issues which would decrease pedestrian visibility as well.

2.5 Alternative J

2.5.1 Alignment Description

Alternative J is the most direct alignment and connects the existing west and east sections of NE 99th Street currently cut off by Curtin Creek. The west leg of NE 99th Street would be widened from two lanes to three lanes plus bike lanes. Connection to NE 72nd Street would be in the current location and would add a signalized intersection, directly adjacent to the railroad grade crossing on NE 72nd Avenue. Reference Appendix F for the proposed plan a profile.

2.5.2 Alignment Constraints

This alignment would utilize an existing narrow ROW on the west currently used as a utility corridor. Additional right of way will be necessary to expand the roadway to 3 lanes.

2.5.3 Proposed Roadway Structures

The structure over Curtin Creek is a 154-foot single-span bridge (center-to-center of abutments) with an out-to-out width of 64'-0". The superstructure consists of seven 74-inch deep precast prestressed wide-flange I-girders (WF74G) supporting an 8-inch cast-in-place deck. 25'-0" minimum approach slabs will be provided in order to mitigate the effects of settlement. The bridge abutments are semi-integral reinforced concrete pile caps on pile foundations, and are skewed approximately 13-degrees. MSE walls will be provided with moment slabs supporting traffic barriers along the wall supported approach roadway.

2.5.4 Utility Impacts

Existing power, sewer and water utilities run down the existing NE 99th Street along the west section. The power lines would need to be relocated to create the necessary room for the proposed section. Adjustments and accommodations for existing water and sewer would need be evaluated during design.

2.5.5 Constructability

The existing NE 99th Street is the only connection to NE 72nd Ave. Construction staging would require maintaining access for the duration of the project. Utilities would also need to be relocated prior to construction which would impact the schedule. Signalization at intersection with 72nd Avenue will be a challenge because of close proximity with the railroad track and require coordination with the rail signals. Also, this alignment has impacts to the WSDOT SCIP mitigation site on the north side of the Curtin Creek crossing.

2.5.6 Design Exceptions

No design exceptions were identified.

2.5.7 Bike and Pedestrian Safety

The direct alignment with a flatter profile provides better visibility for pedestrians but the intersection at NE 72nd Ave is a concern due to the close proximity to the rail crossing. Also, existing driveways connected to NE 99th Street would create opportunities for bike and pedestrian conflict.

3.0 Right of Way Impacts

This section summarizes the anticipated property acquisitions (the amount of new land each alternative would require) and anticipated displacements (the residences and businesses that would be displaced and relocated). Appendix G includes a list of the parcels that would be affected by each alternative with zoning, displacements and County owned parcels identified.

3.1 Method for Determining Impacts

Right of way impacts for each alternative were determined via desktop study based on a 10% level of design. Ownership and parcel information was collected from the Clark County Assessor database. Land values were estimated using comparable sales data from recent appraisals, county assessor's data and RMLS. Estimated relocation costs are based on regulatory limitations and experience.

3.2 Assumptions

The following are assumptions that were made while determining right of way costs and impacts for each alternative.

- Areas will be acquired in Fee when necessary
- Temporary Easements will have a duration of three (3) years
- There will be no cost for any acquisitions from County owned parcels

3.3 Impacts

3.3.1 Alternative D with Overcrossing of Clark County Railroad

- 18 parcels with 10 acquisitions required
- Requires an estimated total of 4.08 acres in Fee and 0.64 acres in Temporary Easement
- Two (2) potential residential displacements
- One (1) potential business displacement

3.3.2 Alternative D with Undercrossing of Clark County Railroad

- 18 parcels with 10 acquisitions required
- Requires an estimated total of 2.77 acres in Fee and 1.17 acres in Temporary Easement
- Two (2) potential residential displacements
- One (1) potential business displacement

3.3.3 Alternative F

- 18 parcels with 11 acquisitions required
- Requires an estimated total of 6.58 acres in Fee and 0.12 acres in Temporary Easement
- One (1) potential residential displacement
- One (1) potential business displacement

3.3.4 Alternative J

- 40 parcels with 35 acquisitions required
- Requires an estimated total of 3.07 acres in Fee and 0.41 acres in Temporary Easement
- Nine (9) potential residential displacements

4.0 Environmental Impacts and Permitting

4.1 Description of the Environment

4.1.1 Wetlands/Waters

All three Project alternatives would involve bridge crossings of Curtin Creek, which is a perennial, fish-bearing (DNR Type 'F') stream. Based on review of Clark County wetland inventory data[1], the majority of the Curtin Creek floodplain consists of "permitted" wetlands which have been field delineated. In addition, there are some Clark County designated "high quality" wetlands that occur immediately northwest of the existing Clark County railroad tracks; one of these wetlands occurs where Alternative D crosses the Clark County Railroad tracks and

[1] A coverage that combines NWI, mapped, permit and modeled wetlands in a single class. Also excludes any of the modeled wetlands that were field verified to not possess wetland characteristics.

the other wetland would not intersect any of the alternatives but would be in close proximity (immediately north of) Alternative J. In addition, there are some existing and proposed wetland mitigation sites that also occur along the Curtin Creek floodplain, or adjacent to the floodplain, for Curtin Creek. The Clark County Curtin Creek Enhancement Area Project developed mitigation site did not create wetlands within the Alternative D alignment.

Work activities within wetland and waterways are regulated by USACE, under Section 404 of the CWA as well as Washington State Department of Ecology (Ecology), under the State water Pollution Control Act. Activities that involve removal and/or fill within jurisdictional wetland and waterway boundaries require a removal-fill permit from one or both agencies, depending on who has jurisdiction over the wetland and water features.

4.1.2 Flood Hazard Areas

All three alternatives would require work activities within the FEMA designated special flood hazard area (Zone AE) of Curtin Creek (FIRM panel 53011C0379D, September 5, 2012). Per Clark County Critical Area regulations (CCC 40.420), construction and development activities within the flood hazard area require a flood hazard permit. In addition, roads that are constructed within floodplains must comply with FEMA no-rise standards for base flood elevations.

4.1.3 Threatened and Endangered Species

Curtin Creek is presumed to contain two ESA-listed fish species including Lower Columbia River (LCR) winter steelhead (*Oncorhynchus mykiss*; state species of concern/federally threatened), and LCR coho (*Oncorhynchus kisutch;* federally threatened).

Section 7 of the Endangered Species Act (ESA) directs all federal agencies to conserve species listed as threatened and endangered through ESA consultation with either USFWS and/or NMFS. ESA consultations typically involve an assessment of potential impacts to listed species and the development of environmental commitments and protective measures to ensure that their proposed actions will not jeopardize the continued existence of any ESA-listed species. The National Marine Fisheries Service (NMFS) manages marine species protected under the federal Endangered Species Act (ESA), including anadramous fish species; therefore, the Project would require ESA-consultation with NMFS for potential impacts to ESA-listed salmonids that occur within the study area.

4.1.4 Critical Areas

Per the Clark County Critical Areas Ordinance (CCC 40.4), critical areas are defined to include: wetlands, critical aquifer recharge areas (CARAs), flood hazard areas, geologic hazard areas, habitat conservation areas, and shoreline areas which are regulated under the shoreline management act. Construction and development activities within critical areas require a critical area permit from Clark County, and are subject to compliance with applicable development standards outline in the critical area ordinance.

There are shorelines of the state under SMA jurisdiction that occur within the study area; Curtin Creek is a Type 'F' water and is not classified by DNR as a shoreline of the state (Type 'S' water). Review of Clark County shoreline maps confirmed that Curtin Creek does not have any designated shoreline buffer. However, the study area does contain the remaining types of critical areas including wetlands, flood hazard areas, habitat conservation areas, and geologic hazard areas.

Wetlands and flood hazards within the study area are previously described in Sections 2.1 and 2.2, respectively.

All parcels within the alternative alignments are designated as a Category 2 CARA Recharge Areas.

Habitat conservation areas within the study area include the riparian buffer of Curtin Creek, which is mapped as a priority habitat (riparian habitat conservation area) by WDFW. In addition, some small clusters of mature trees along NE 99th Street, west of the subdivision and east of the railroad crossing, are also mapped as priority habitat components; the trees include 100-foot buffers and development within these areas requires notification to WDFW.

Geologic hazards within the study area are limited to a small area of mapped landslide hazard that occurs along the Alternative J alignment. The landslide hazard area is located where the western boundary of the Curtin Creek floodplain meets the eastern edge of subdivision D at NE 99th Avenue. ext.

4.1.5 Stormwater Treatment and Conveyance

Stormwater generated from new impervious surface will be required to be treated in accordance with the Clark County Stormwater Manual 2015 for both quality and quantity prior to discharge.

4.1.6 Historic Resources

There are no known historic resources in the proximity of any of the alternatives being reviewed.

4.2 Environmental and Permitting for Each Alternative

All alternatives being considered include a bridge crossing of Curtin Creek and would require development activities within the jurisdictional wetlands and waters, flood hazard areas, shoreline area and other critical areas. These project elements would require a wetland removal-fill permit from USACE/Ecology, shoreline permit, and a special flood permit/critical area permit from Clark County. As part of the removal-fill permit process, wetland impacts would need to be mitigated through the purchase of mitigation credits from a wetland mitigation bank. All alternatives being evaluated formal consultation with NMFS for potential impacts to ESA-listed salmonid species would be required for this alternative.

4.2.1 Alternative D with Overcrossing of Clark County Railroad

Alternative D would not impact the existing wetland mitigation sites associated with the Curtin Creek Enhancement Area. There are hydric soils and high quality wetlands immediately west the Clark County Railroad that would likely be impacted by this alignment.

4.2.2 Alternative D with Undercrossing of Clark County Railroad

The undercrossing of the Clark County Railroad will have similar impacts as the overcrossing option. This is due to the location and orientation of high quality wetlands.

4.2.3 Alternative F

Alternative F follows the same alignment through Curtin Creek Enhancement Area as Alternative D. This Alternative would avoid the high quality wetlands immediately west of the Clark County Railroad, but is likely to have greater impacts to high quality wetlands than Alternative D due to the location of high quality wetlands south of NE 99th Street east of NE 72nd Avenue.

4.2.4 Alternative J

Alternative J utilizes a different alignment through the Curtin Creek Enhancement Area than Alternative F or Alterative D. This alternative would have greater impacts to wetlands within the Curtin Creek Enhancement Area than Alternatives D and F. Alternative J may result in higher mitigation costs and would generally make the wetland permit process more challenging, requiring a more robust justification for the proposed action and a more detailed analysis of potential alternatives.

The alignment would impact the Precision Paving property which is suspected to contain hazardous materials.

5.0 Cost and Impact Comparison

5.1 Cost and Impact Methodology

Each alternative was evaluated to determine costs and Impacts of significant elements of work. The intent of determining costs and impacts was not to calculate an overall construction cost estimate but to compare significant elements of works by alternative. A detailed cost breakdown for each alternative can be found in Appendix H. All costs are based on 2018 costs. The costs shown should not be used a basis to determine overall construction cost.

The following items were compared by alternative;

- Construction Cost of major elements based on estimated costs.
- Right of Way acquisition cost based on estimated costs.
- Residential Property Impact based on the number of parcels impacted.
- Environmental Impacts based on a quantitative analysis.

Each alternative was compared to each other and ranked on a score between 1 (the least) and 4 (the most). The costs and impacts below are weighted equally among all categories.

5.2 Alternative Cost and Impact Comparison

The following table summarizes the comparison of costs by alternative.

ALTERNATIVE	CONSTRUCTION COST	RIGHT OF WAY COST	RESIDENTIAL IMPACT	ENVIRONMENTAL IMPACT	AVERAGE SORE
D WITH RR OVERPASS	4	2	3	3	3.0
D WITH RR UNDERPASS	3	1	2	2	2.0
F	2	3	1	1	1.8
J	1	4	4	4	3.3
	1	Least			
	4	Most			

6.0 Summary

6.1 Alternative Recommendations

After evaluating each alternative per the criteria established in this memo, we recommend that the County further evaluate Alternative F for the following reasons;

- Alternative F utilizes the pre-established corridor through Curtin Creek thus avoiding new impacts.
- Alternative F utilizes the County's existing ROW West of Curtin Creek.
- Alternative F avoids the cost of grade separating Clark County Railroad.
- Alternative F has grades that are more easily navigated by Pedestrians and Bicyclists.
- Alternative F has the least impacts to existing residential homes.
- Alternate F has the greatest separation from the Intersection of NE 72nd and Clark County Railroad.

6.2 Next Steps

A more detailed design is recommended to fully establish anticipated project construction costs for Alternative F.

APPENDIX A:

NE 99th Street

(NE St. Johns Road to NE 94th Avenue)

Range of Alternatives Report

January, 2009

NE 99th Street
(NE St. Johns Road to NE 94th Avenue)

CRP# 371222

Range of Alternatives Report

January 2009

Prepared for:

Clark County Department of Public Works
1300 Franklin Street, Vancouver, Washington 98666

Prepared by:

HDR Engineering, Inc.
1001 SW Fifth Ave, Suite 1800, Portland, Oregon 97204

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Introduction

Clark County plans to develop a continuous minor arterial from Interstate 5 (I-5) to State Route (SR) 503 along NE 99th Street. Currently, there is a missing roadway link between NE St. Johns Road and NE 94th Avenue that causes traffic to divert to adjacent roadways and creates out-of-direction travel. The NE 99th Street (NE St. Johns Road to NE 94th Avenue) project proposes to fill in the missing link by constructing a new roadway extending NE 99th Street between NE St. Johns Road and NE 94th Avenue.

Since the 1980s the County has planned to develop NE 99th Street between St. Johns Road and NE 94th Avenue. The right-of-way (ROW) was platted for the roadway and the tunnel under Interstate 205 (I-205) was constructed to accommodate a two lane minor arterial in addition to the existing Chelatchie Prairie Railroad. A preliminary alignment of the road completing the NE 99th Street corridor is included in the County's Arterial Atlas, which is a component of the transportation element of the Clark County 20-Year Comprehensive Growth Management Plan 2004-2024 (2007). However, further study was needed to develop additional alternatives that may be feasible given current constraints. This report documents the basis for development of potential alignment alternatives and evaluates those alternatives given the benefits and environmental, land use, and constructibility constraints of the project area.

Following the remainder of the Introduction, this report includes the following sections: Purpose and Need, Project Study Area, Environmental Constraints, Range of Alternatives, Conclusions/Recommendations, and References.

Report Description

This report summarizes the range of preliminary alternatives developed and analyzed by the Project Team for the NE 99th Street (NE St. Johns Road to NE 94th Avenue) project and documents the process used to evaluate and select the most suitable alternatives for further analysis. The next phase of this process will include a more detailed analysis of those selected alternatives.

Clark County will receive federal funding through the Federal Highway Administration (FHWA) for the NE 99th Street (NE St. Johns Road to NE 94th Avenue) project; therefore, this project is subject to the conditions and documentation requirements of the National Environmental Policy Act (NEPA).

One of the primary objectives of this report was to prepare a document that would serve as the basis for future NEPA documentation, as well as comply with Federal Highway Administration (FHWA) standards for the integration of planning and NEPA processes (FHWA, 2005). The alternative analysis is consistent with the FHWA guidance, which is discussed in the Range of Alternatives section of this report.

This project was initiated in September 2007 by Robin Washington, Project Manager for Clark County Public Work's (CCPW) Engineering/Capital Improvement Program (CIP). Preliminary route alternatives were then developed by the CIP Design Section, in conjunction with the Project Team. Those preliminary routes were then referred to the Project Team for discussion and further analysis. Project Team members are listed in Table 1.

Table 1: Project Team

Name	Department
Robin Washington	CCPW – Project Management Section
Traci Carick	CCPW – Project Management and Design Section
Lisa Hemesath	CCPW – Environmental Permitting Section
Bill Wright	CCPW – Transportation Improvement Program
Ejaz Khan	CCPW – Traffic Engineering/Operations
Lynda Toland	CCPW – Real Property Services Section
John Milne	CCPW – Design Section
Rod Russell	CCPW – Design Section
John Davis	CCPW – Transportation Improvement Program
Ken Hash	Washington Department of Transportation (WSDOT) Highways & Local Programs

Land Use and Transportation Plans

In 1990, the Washington State legislature passed the Growth Management Act (GMA) to provide a framework for efficient local planning to manage statewide growth at the local level and to maintain the state's quality of life. The GMA mandates that counties and cities that have a population of more than 50,000 persons or have experienced a greater than 10 percent increase in population in the previous 10 years adopt comprehensive land use plans and development regulations that comply with state requirements. These plans must accommodate 20-year growth forecasts prepared by the Washington State Office of Financial Management. The plans must also coordinate planning for transportation facilities and services to meet existing and future demands resulting from growth and development. Development projects in Washington, including roadway improvements, must demonstrate that they are consistent with Washington State GMA-required comprehensive plans and regulations based on the State of Washington Local Project Review Act (RCW 36.70B) and the State Rules (WAC 365-197). Clark County has adopted the Clark County 20-Year Comprehensive Growth Management Plan 2004-2024 (2007), as amended, which meets the mandates of the GMA.

The Comprehensive Growth Management Plan is a compilation of many elements that describe how the County wants to grow and develop in the coming years. The plan guides short-term and long-range decisions about future development through the use of adopted goals and policies for each element. The proposed project must be consistent with the land use and transportation elements of the Comprehensive Growth Management Plan.

The GMA also requires counties to establish level of service (LOS) standards for the arterial road system. Transportation improvements necessary to sustain the LOS are incorporated in the Comprehensive Growth Management Plan's 20-year Transportation Capital Facilities Plan (CFP). The projects in the 2008-2013 Clark County Transportation Improvement Program (TIP) (2007) must be consistent with the CFP.

As a means of planning for growth, improving mobility, and addressing congestion, Clark County Public Works prepares a yearly update for the TIP. The TIP represents the County's transportation priorities for a six-year time period and identifies proposed road, bridge, bicycle, and pedestrian improvements throughout the community. The TIP includes a prioritized list of projects that balance the increasing transportation demands in the area with the limited financial resources available to the County. The TIP establishes the six-year program priorities essential to achieve the goals and objectives of the Comprehensive Growth Management Plan.

Public involvement is an important component of the TIP. Throughout the year, the County participates in open houses, presents project information to the public at neighborhood and business association meetings, holds Transportation Improvement Program Involvement Team (TIPIT) meetings, maintains an internet information web site, prepares news releases and newspaper advertisements, and holds weekly or biweekly public meetings during construction of projects.

Project Background

Currently, the movement of people and goods between the economic and residential centers in the project area is restricted and congestion on the existing east-west routes of Padden Parkway and NE 119th Street is worsening. To address this issue, the CFP recommends the development of an east-west corridor along NE 99th Street between SR 503 and I-205. The adopted Arterial Atlas designates this proposed NE 99th Street corridor as a minor arterial, which is designed to collect and distribute traffic from principal arterials to streets of lower classifications and may also allow traffic to directly access some destinations (40.350.020 (5)(a)(3)).

The 99th Street transportation corridor is broken down into smaller segments in the TIP. This NE 99th Street (NE St. Johns road to NE 94th Avenue) project is a combination of two segments in the TIP: NE 99th Street - St. Johns Road to NE 72nd Avenue and NE 99th Street - NE 72nd Avenue to NE 94th Avenue.

The proposed route is largely defined by the principal arterial roadways of NE St. Johns Road and NE 72nd Avenue, both of which run north-south. The proposed route would add a new east-west connection that would serve through traffic and provide access to commercial, industrial, office, and residential development, thus helping facilitate the Comprehensive Growth Management Plan land use and transportation goals and policies.

To begin the planning process for the NE 99th Street corridor, the Project Team conducted a traffic analysis along the proposed NE 99th Street corridor (Clark County, 2008). The estimated average daily traffic (ADT) along the proposed NE 99th Street corridor was modeled using the estimated traffic volume projected in 2024. The traffic analysis separated the proposed corridor by major north-south roadways. The results of the each segment are as follows:

- Segment between St. Johns Road and NE 72nd Avenue: 10,000 ADT (Segment 1)
- Segment between NE 72nd Avenue and NE 94th Avenue: 6,000 ADT (Segment 2)

The traffic analysis indicated that, if built, the proposed roadway linking NE St. Johns Road and NE 72nd Avenue would serve approximately 10,000 vehicles per day. Based on the traffic analysis and projected traffic volumes for the proposed NE 99th Street corridor, it was determined that:

- Segment 1 is regionally significant and if not built, it would cause major out-of-direction travel and stifle the land use growth potential in the area.
- A significant share of Segment 2 ADT would consist of local destination trips; however, if not built, development of local land served by Segment 2 would be stifled. Failure to build Segment 2 may also preclude the development of an adequate transportation corridor for post-2024 traffic demands.

Therefore, the Project Team recommended that a Range of Alternatives Report be prepared to document the development of potential NE 99th Street corridor alignments in Segments 1 and 2 of the NE 99th Street corridor.

Purpose and Need

According to FHWA guidance (FHWA, 2005), a sound transportation planning process is the primary source of a project's purpose and need. Through transportation planning, state and local governments, and with the involvement of key stakeholders and the public, the following actions should be taken:

- Establish a vision for the region's future transportation system;
- Define transportation goals and objectives for realizing that vision;
- Decide which needs to address; and
- Determine the time frame for addressing these issues.

The transportation planning process also provides a forum to define a project's purpose and need by framing the scope of the problem to be addressed by a project. This scope may be further refined during the transportation planning process as more information about the transportation need is collected and consultation with the public and other stakeholders clarifies other issues and goals for the region.

The purpose and need statement for the project was used to develop evaluation criteria and focus detailed analysis on those alternatives that address the underlying transportation issues.

Purpose of the Proposed Action

The purpose of the proposed action is to complete an east-west arterial link from NE St. Johns Road to NE 94th Ave for travel between I-205 and SR-503.

The proposed transportation corridor linking NE St. Johns Road and NE 94th Ave is part of the Comprehensive Growth Management Plan and CFP with the overall goals of improving mobility and reducing traffic congestion. There are immediate needs to alleviate current traffic congestion in the project area and the proposed project would meet present needs and long-term goals identified in the Comprehensive Growth Management Plan and CFP. Existing east-west traffic corridors in the network include NE 88th Street, NE Padden Parkway, and NE 119th Street.

Need of the Proposed Action

1. To enable the existing and planned roadway system network to operate within acceptable levels of service and to meet the following transportation goals:
   - To address congestion, safety, and mobility.
   - To provide a direct east-west route and prevent out-of-direction travel.
   - To facilitate multiple modes of travel, including bicyclists and pedestrians.
2. To support the Clark County Comprehensive Growth Management Plan.
3. To provide a context-sensitive design that accounts for the natural resources located in the area, existing development, as well as the planned uses in the area.
4. To provide a project that optimizes the use of limited available public funding.

Project Study Area

The study area is located in the southwest portion of Clark County between the major north-south highways of I-5 and SR 503. The study area encompasses the area surrounding the potential alignment alternatives for the new corridor (Figure 1). The major transportation facilities within the study area include I-205, St. Johns Road, NE 72nd Avenue, NE 119th Street, NE 99th Street, NE 88th Street, and NE Padden Parkway. I-205 is a major north-south highway, which runs northwest-southeast through the study area. St. Johns Road and NE 72nd Avenue run north-south and are classified as urban principle arterials, each having four travel lanes and a center turn lane. Padden Parkway runs east-west and is classified as an urban principle arterial, having four travel lanes. NE 119th Street, NE 99th Street, and NE 88th Street are east-west routes with two travel lanes. A project to improve NE 88th Street to two travel lanes and a center turn lane between NE St. Johns Road and NE Andresen Road is currently under construction.

Environmental Constraints

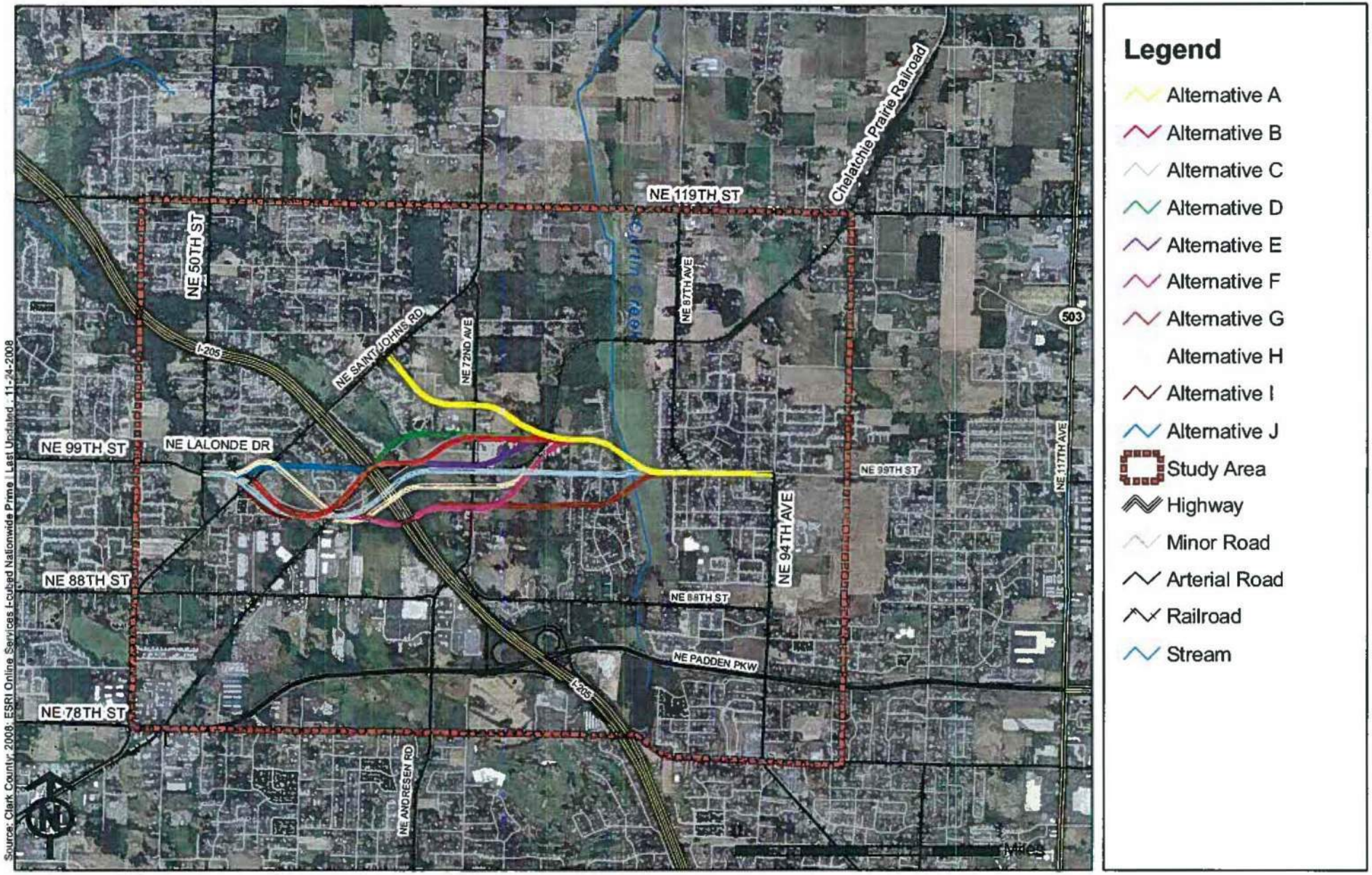
The environmental constraints in the project study area consist of the existing transportation system, natural resources, and built environment resources. These environmental constraints were used in developing the alternative evaluation criteria. The presence of natural resources, location of buildings and land uses, and constructibility issues present various challenges for the proposed roadway. The identification of evaluation criteria and a process to evaluate how these constraints influence the proposed roadway allowed the Project Team to eliminate some preliminary alignment alternatives from further evaluation.

Transportation

The transportation system within the study area is shown in Figure 1.

Within the study area there are two principle arterials that run north-south: NE St. Johns Road and NE 72nd Avenue. The cross sections of these roads were recently improved to a 4-lane principal arterial with center turn lane/median, bike lanes, and sidewalks. Except for the improved NE 88th Street, the only east-west minor arterial route in the study area is NE 119th Street.

In the study area, the missing link of the NE 99th Street corridor creates out-of-direction travel and increases congestion along major corridors and at a number of intersections of regional significance. In addition, the Chelatchie Prairie Railroad traverses the study area from the southwest corner to the northeast corner; existing railroad crossings impact traffic flow in the study area and the proposed corridor will include at least one new crossing of the railroad tracks.



Project Area

FIGURE 1

NE 99th Street (NE St Johns Road to NE 94th Ave) | Clark County | Range of Alternatives Report

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Natural Resources

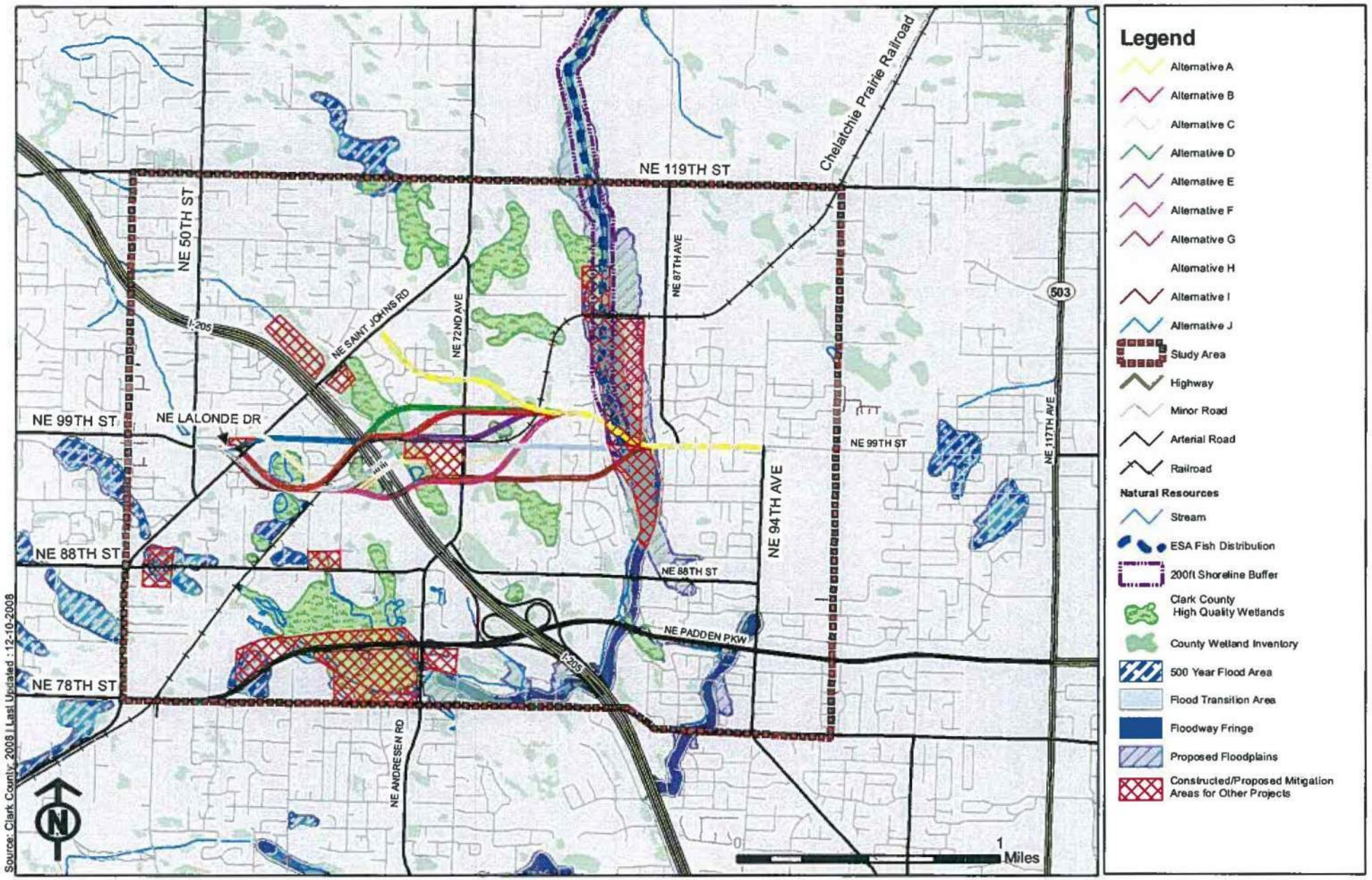
Natural resources within the study area are shown in Figure 2.

The study area spans portions of the LaLonde Creek and Curtin Creek sub-basins of the Salmon Creek watershed. Both of these watersheds contain streams that support Endangered Species Act (ESA)-listed fish species. The development of a new corridor would require the construction of a new crossing over Curtin Creek, which supports ESA-listed fish species. There are also wetlands, including high quality wetlands, within the study area. These features are protected under state and federal laws but also contribute scenic, ecological, and economic value to the area. The topography in the area is generally flat, supporting the numerous wetlands. As a result of the flat topography, conveyance, treatment, and control of stormwater runoff can pose problems for the design of transportation facilities.

There are shorelines designated under the Washington Shoreline Management Act (Chapter 90.58 RCW) associated with Curtin Creek in the study area. Development within a designated shoreline area (within 200 feet of Curtin Creek) is restricted to protect water quality and the stream corridor from uncoordinated and piecemeal development. Clark County administers shoreline development permits in cooperation with the Washington Department of Ecology (DOE).

In addition to the shoreline areas, there are floodplains associated with Curtin Creek within the study area. Construction of roads within floodways must comply with Federal Emergency Management Agency's (FEMA) no-rise standards.

There are nine existing wetland and/or stormwater mitigation sites within the study area that are related to other projects in the area. Modification to these sites is discouraged as they were created to offset adverse impacts incurred by other projects. Additionally, impacts to these existing mitigation sites may complicate project design and require additional permitting and consideration.



Natural Resources

FIGURE 2

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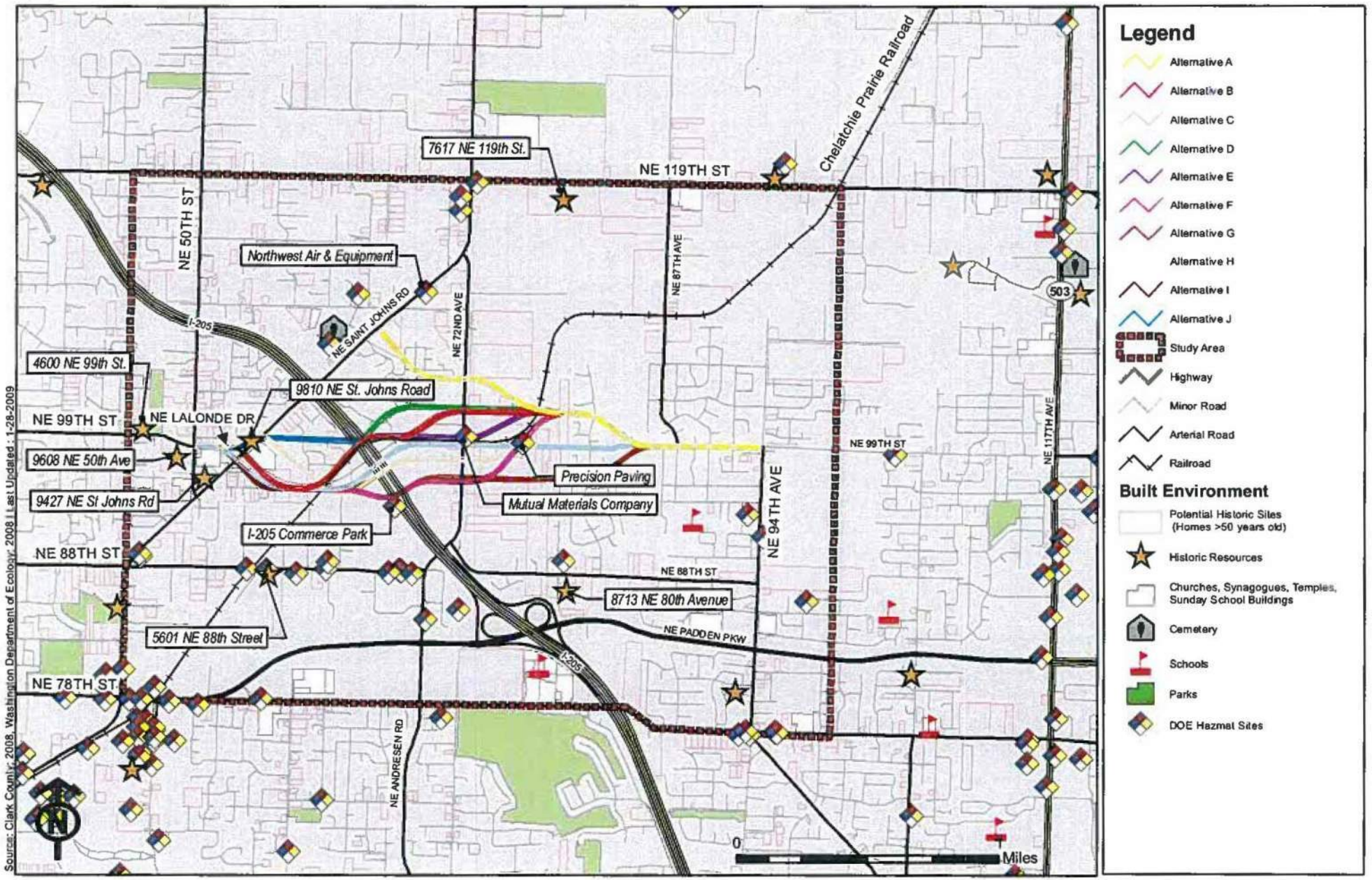

Built Environment

FIGURE 3

NE 99th Street (NE St Johns Road to NE 94th Ave) | Clark County | Range of Alternatives Report

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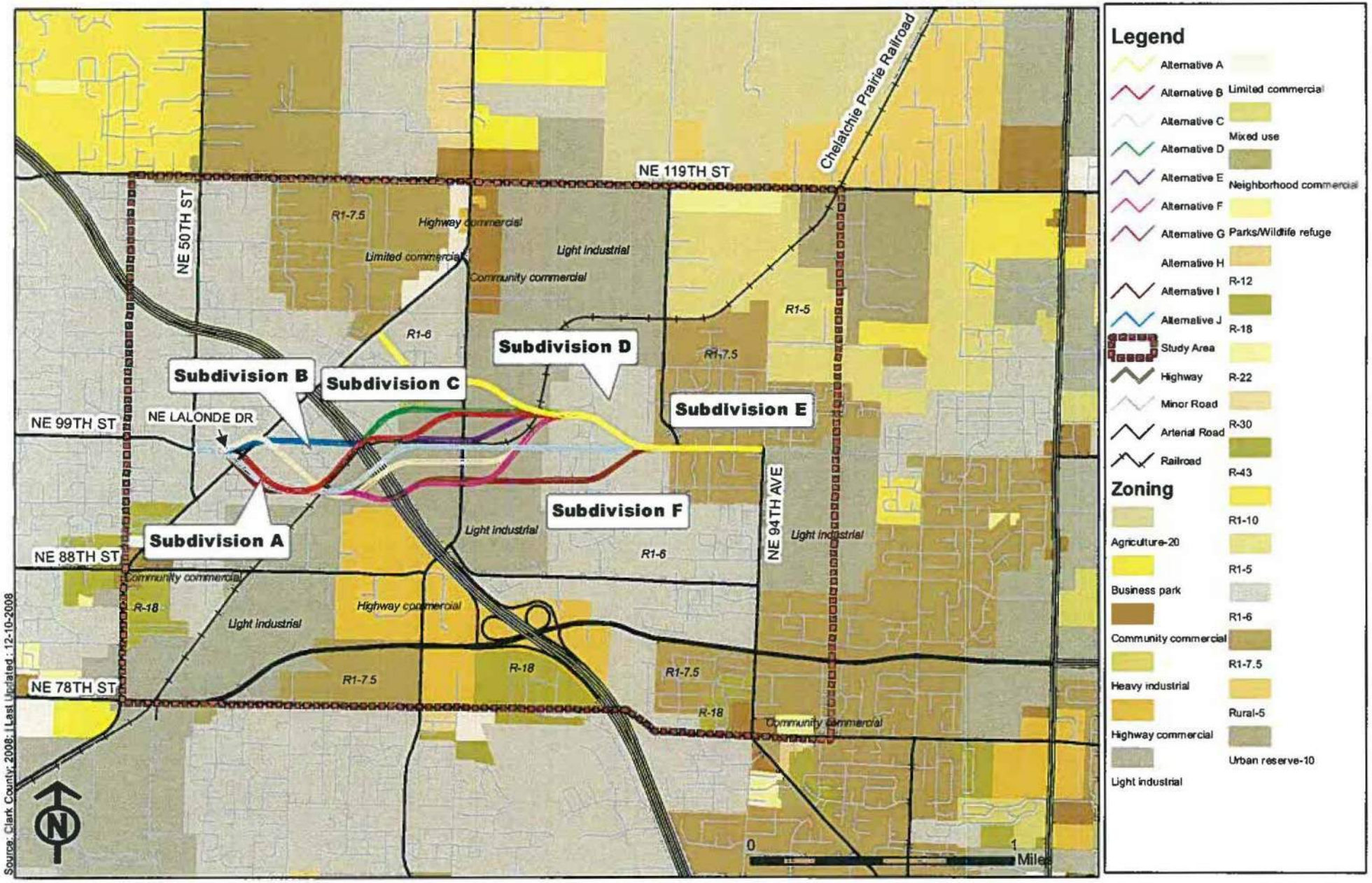


Existing Subdivisions and Zoning

FIGURE 4

Built Environment Resources

The built environment within the study area is shown in Figure 3. Existing subdivisions and zoning are shown in Figure 4.

In addition to the natural resources, the built environment of the project area includes residential housing developments, commercial and industrial properties, historic resources, churches, a cemetery, schools, a park, and hazardous material sites (Figures 3 and 4).

The study area is predominantly zoned residential with a band of commercial and industrial zoned land that traverses the study area from north to south (Figure 4). Existing land uses in the study area consist of a mosaic of developed subdivisions and underdeveloped commercial and industrial land. Enhancement of the east-west thoroughfare in the study area would service these local land uses and reduce congestion on existing routes.

There are six major subdivisions (Subdivisions A through F; Figure 4) within the study area that contain high density, single-family homes. These subdivisions could potentially be impacted by alignment alternatives.

Three major industrial businesses are located within the study area. Barberton Industrial Park and Mutual Materials are located north of NE 99th Street on NE 72nd Avenue, near the proposed NE 99th Street corridor, and could potentially be impacted by alignment alternatives. Frontier Landscaping is located north of the proposed NE 99th Street corridor on NE St. Johns Road near it's mergence with NE 72nd Avenue.

According to the state and national registries of historic places there are eight properties designated as having significant historical value (Figure 3). In addition, there are numerous properties within the study area that have buildings constructed more than 50 years ago. Buildings older than 50 years could potentially be considered historic and therefore require additional investigation to determine if they qualify for protection under Section 106 of the National Historic Preservation Act.

There are ten churches located in the study area. Two churches are located near the proposed intersection with NE St. Johns Road (Figure 3) and could potentially be impacted by alignment alternatives.

The St. John Cemetery is located within the study area, northwest of the proposed NE 99th Street corridor (Figure 3).

Sunset Elementary School and Cornerstone Christian School are located within the study area, south of the proposed NE 99th Street corridor (Figure 3). Lalonde Park is located within the study area, west of the proposed NE 99th Street corridor (Figure 3).

According to the DOE, there are 27 sites in the study area that may contain hazardous materials (Figure 3). The sites may actively use hazardous materials, e.g., for industrial purposes, or may be sites where spills of hazardous materials have occurred in the past. Two sites within the study area are located near the proposed NE 99th Street corridor (Figure 3): the Precision Paving site is located on NE 99th Street and the Mutual Materials site is located north of NE 99th Street on NE 72nd Avenue. Project-related impacts to these properties may result in additional cleanup costs for the project and require additional permitting.

Range of Alternatives

NEPA directs agencies to consider a range of alternatives during the planning phase of transportation projects. For this project, Clark County developed and considered ten possible roadway alignment alternatives to connect NE 99th Street between NE St. Johns Road and NE 94th Avenue.

Alternative Development

Clark County transportation planners recognize the potential impacts and disruptions, as well as benefits, from the construction of a new east-west thoroughfare linking NE St. Johns Road to NE 94th Avenue. Therefore, they have completed a preliminary alternative analysis to determine feasible routes that best protect natural resources and limit disruption to land uses while still meeting transportation goals. To establish a rational evaluation process, ten alternative alignments (labeled alphabetically A through J) were developed for review. These preliminary alignments were developed to identify feasible routes connecting NE St. Johns Road to NE 94th Avenue (Figures 2, 3, and 4). An additional alternative (K) was proposed via public comment. That eleventh alternative was the most direct route, but was not included in the detailed alternative analysis as it would clearly have resulted in greater impacts to resources and more severe constructibility issues than those in Alternatives A through J.

Alternative Analysis

The alternative analysis was designed to take a broad view of possible east-west alignments between NE St. Johns Road and NE 94th Avenue and help the Project Team quantify, as much as possible, the advantages and disadvantages of each alternative. The Project Team developed evaluation criteria to compare the alternatives and identify which alternatives adequately met the purpose and need. The evaluation criteria were classified into five primary categories: transportation, natural resources, built environment resources, cost, and constructibility. Each of the alternatives under consideration was then evaluated in terms of their transportation impacts, construction cost, social, economic, and environmental impacts, and technical considerations (FHWA, 2005).

Each primary category was assigned a weighting factor that allowed the Project Team to establish and focus on key issues, complete a consistent and balanced review across issues, and minimize subjectivity. Because the primary purpose of the project was to develop a road alignment that improves mobility and reduces congestion, transportation was given the highest weighting. Constructibility was given the same weighting as transportation because an unbuildable design is considered a "fatal flaw". The weighting factors were as follows:

- Transportation: multiplication factor of 3
- Natural Resources: multiplication factor of 2
- Built Environment Resources: multiplication factor of 1.5
- Cost: multiplication factor of 1
- Constructibility: multiplication factor of 3

Each alignment alternative was scored separately based on the positive or negative impact to each individual criterion. The alternatives were ranked for each category using quantified values, wherever possible. Qualitative ranking, using the best professional judgment of the Project Team was used for more "intangible" criteria. These "category rankings" were multiplied by the weighting factor for that category, and then summed to give each alternative a total weighted score (with a lower score representing a superior alternative). This numerical score

was then used to establish the final rank of each alternative. Alternatives that did not meet the purpose and need were dropped from the overall ranking.

As previously mentioned, the Project Team developed evaluation criteria to objectively compare the alternative alignments (Table 2). These criteria aided the Project Team in ranking the ten alternatives according to the alignments that best met the purpose and need of the project.

Table 2: Evaluation Criteria Used to Compare Alternative Alignments

Criterion	Description
Transportation	
Traffic	The ability of the alternative to best serve the local land use, address traffic congestion, provide a direct route, prevent out-of-direction travel, and optimize corridor capacity and superior traffic operations.
Safety and Mobility	Effectiveness of the alternative in meeting safety and mobility standards. Alignments with fewer and gentler curves were favored over those with numerous and sharp horizontal curves.
Multimodal	Each alignment meets the multimodal requirements of Clark County; therefore, this criterion was not a discriminating factor to distinguish the preferred alternatives.
Natural Resources	
Streams	The number of streams crossed by the alternative. Crossing of streams may increase the possible impacts to fish and aquatic habitat. All the alternatives crossed Curtin Creek; therefore, this criterion was not used to distinguish the preferred alternatives.
ESA Species/Habitat	The number of streams crossed by the alternative containing ESA-listed fish or designated as Critical Habitat. Construction of a new bridge over streams containing ESA-listed fish species requires consultation with the National Marine Fisheries Service. All the alternatives crossed Curtin Creek; therefore, this criterion was not used to distinguish the preferred alternatives.
Shorelines	The amount of designated shorelines crossed by the alternative. The Washington State Shoreline Management Act identifies riparian areas near streams. Development within shoreline areas requires permitting through the DOE. All the alternatives crossed Curtin Creek shorelines; therefore, this criterion was not used to distinguish the preferred alternatives.
Wetlands	Total acres, number of wetlands, and number of high quality wetlands impacted by the alternative. Development that impacts wetlands must be permitted through the U.S. Army Corps of Engineers, the DOE, and Clark County. Impacts to wetlands designated as "high quality" are generally more difficult to mitigate because of higher mitigation ratios. Alternatives with fewer impacts to wetlands were favored.
Flood Zones	Total acres of floodplains, flood areas, floodways impacted by the alignment. All the alternatives crossed the floodplains of Curtin Creek; therefore, this criterion was not used to distinguish the preferred alternatives.
Mitigation Areas	Evaluation of the alternative impacting existing mitigation areas or stormwater facilities. Preference was given to alternatives that impacted fewer mitigation sites and stormwater facilities, and utilized the existing ROW through the Curtin Creek Enhancement Area.

Criterion	Description
Built Environment Resources	
Residential	Acres of residential land impacted, number of residential relocations, number of residences purchased and resold, and residential subdivisions impacted by the alternative. This criterion evaluates the disturbance to existing residential areas and residences. Platted properties that are zoned residential but have yet to be developed were included to assess the loss of potential housing. A high value indicates the alternative impacts densely populated areas, individual property owners, and community cohesion. Preference was given to alternatives that avoid impacts to highly developed subdivisions.
Businesses	Acres of business land impacted and number of businesses impacted by the alternative. Preference was given to alternatives that avoid industrial properties.
Historical and Cultural Resources	Number of known historical or cultural resources impacted by the alternative.
Hazardous Materials Sites	Number of known properties that contain or likely contain hazardous materials. Acquiring property containing hazardous material for the new corridor would add additional cleanup costs and may complicate project development. Alternatives that avoid potential hazardous material sites were favored.
Socioeconomic	Number of community facilities impacted by the alternative. Disruption of established neighborhoods or community facilities such as churches, schools, parks, hospitals, or cemeteries was discouraged. Alternatives with fewer community facility impacts were favored.
Cost	
Wetland mitigation	The estimated cost to replace or mitigate wetlands impacted by the alignment.
ROW	The estimated cost to purchase ROW property for the alternative.
Construction	The estimated cost for design, materials, and labor to construct the roadway along the alternative alignment.
Total cost	The sum of wetland mitigation costs, ROW costs, and construction costs. Alternatives with lower total costs were favored.
Constructibility	
Road Length	The total length of the roadway for the alternative. A direct, short route is preferred.
Bridge/Tunnel Requirements	Identifies if the alternative would not cross I-205 or would require construction of a new bridge over I-205, a new tunnel under I-205, or modification of an existing tunnel under I-205. A new bridge over Curtin Creek is required for all alternatives; therefore, this bridge was not included in this criterion. Alternatives with fewer constructibility issues were favored.
Railroad Impacts	A qualitative assessment of the railroad impacts for the alternative. Each alternative includes one or two at-grade railroad crossings. The alternatives vary on angle of approach and signalization requirements. Alternatives with a less than minimum pre-defined distance from the railroad crossing were eliminated. Alternatives with perpendicular, at-grade crossings were favored.

Evaluation of Alternatives

The impacts to evaluation criteria and results of the alternative analysis are reported in the Alternatives Evaluation Matrix (Appendix A). Table 3 summarizes the strengths and weakness of each alternative based on the results of the comparisons.

Table 3: Alternative Strengths and Weaknesses

Alternative	Strength	Weakness
A	▪ Good alignment ▪ Minimal curves ▪ Shortest route ▪ Least impact to wetlands	▪ Does not serve local land use ▪ Does not meet purpose and need
B	▪ Good connection to Lalonde Drive and St. Johns Road	▪ Excessive curves, may not meet safety criteria ▪ Impacts existing subdivisions, industrial buildings, and church building
C	▪ Perpendicular intersection with St. Johns Road ▪ Minimal curves	▪ Impacts two mitigation sites ▪ Impacts subdivisions ▪ Difficult tunnel drainage and construction ▪ No separation from railroad at 72nd Avenue
D	▪ Good connection to Lalonde Drive and St. Johns Road ▪ Utilizes existing corridors and ROW ▪ Low impact to industrial properties	▪ Impacts subdivisions
E	▪ Good potential for access management ▪ Utilizes existing corridors and ROW	▪ Excessive curves, may not meet safety criteria ▪ Impacts subdivisions, industrial buildings, and church building ▪ No separation from railroad at 72nd Avenue
F	▪ Good connection to Lalonde Drive and St. Johns Road ▪ Utilizes existing corridors and ROW	▪ Does not serve local land use well ▪ Fragments high quality wetlands ▪ Impacts mitigation site ▪ Impacts church building
G	▪ Minimal curves ▪ Good connection to Lalonde Drive and St. Johns Road	▪ Does not serve local land use well ▪ Fragments high quality wetlands ▪ Impacts two mitigation sites ▪ Impacts subdivisions and church building
H	▪ Good potential for access management ▪ Minimal curves ▪ Utilizes existing corridors and ROW ▪ Least impact to subdivisions and industrial property	▪ Fragments high quality wetlands ▪ Impacts two mitigation sites ▪ Difficult tunnel drainage and construction
I	▪ Excellent intersection alignment with St. Johns Road ▪ Good potential for access management ▪ Utilizes existing corridors and ROW	▪ Fragments high quality wetlands ▪ Impacts mitigation site ▪ Difficult tunnel drainage and construction
J	▪ Most direct route ▪ Minimal wetland impacts	▪ Poor intersection angle with NE St. Johns Road ▪ Impacts existing mitigation site ▪ Impacts industrial buildings ▪ Difficult tunnel expansion ▪ No separation from railroad at 72nd Avenue

Alternative Ranking

In the alternative evaluation, the Project Team first ranked the alternatives for each category (Alternatives Evaluation Matrix, Appendix A). This category ranking was based on the quantitative and qualitative information in the Alternatives Evaluation Matrix (Appendix A) and represents the best professional judgment of the Project Team.

As previously mentioned, these category rankings were then weighted and summed to first develop a score for each alternative and finally an "overall rank" for that alternative. The complete results are shown in the Alternatives Evaluation Matrix (Appendix A). Table 4, below, summarizes both the ranking of each alternative for each evaluation criteria category followed by the weighted, overall rank of each alternative for the completed alternative evaluation.

Table 4: Alternative Ranking for each Evaluation Criteria Category

Alternative	Transportation [a]	Natural Resources	Built Environment	Cost	Constructibility	Overall Rank [b, c]
A	5	1	8	1	1	**10**
B	6	6	10	8	5	**7**
C	7	3	1	4	10	**6**
D	3	4	7	2	2	**1**
E	7	5	9	10	6	**8**
F	4	7	4	3	3	**2**
G	4	10	5	5	4	**4**
H	2	9	3	6	8	**5**
I	1	8	2	7	7	**3**
J	8	2	6	9	9	**9**

[a] *Alternatives with the same ranking value had the same net positive or negative transportation impacts.*

[b] *The Overall Rank is the sum of each weighted evaluation criteria category. The weighting is as follows: Transportation = 3, Natural Resources =2, Built Environment Resources = 1.5, Cost = 1, and Constructibility = 3.*

[c] *In the Overall Rank, alternatives are ranked from 1 to 10 with a lower score representing a superior alternative.*

Alternatives Eliminated from Further Consideration

Based on the outcome of ranking, 8 of the 10 alternatives were eliminated from further consideration in future NEPA documentation. These alternatives were eliminated because they did not meet the purpose and need, would result in greater impacts than a similar alternative, or would have severe constructibility issues. The following section provides a brief summary of the rationale used to exclude the alternatives not selected by the Project Team.

Alternative A: This northern alignment would not serve the local land use for transportation. The alignment would not serve as a direct through route to I-5 traffic. Therefore it would not meet the purpose and need for providing a direct route that prevents out-of-direction travel.

Alternative B: This alignment would not meet the safety and mobility criterion as there are too many horizontal curves. Therefore, it would not meet the purpose and need in providing a route that addresses congestion, safety, and mobility. Additionally, there would be substantial impacts to subdivisions, Barberton Industrial Park, and a church, which would make this alternative very expensive due to the ROW costs. Therefore, this alternative would also not meet the purpose and need in terms of providing a context-sensitive design by limiting impacts to existing developments.

Alternative C: This alternative would include construction of an expensive new tunnel under I-205, which would have severe drainage and constructibility issues. The alternative would also be operationally deficient due to the close proximity to the railroad at 72nd Avenue and therefore does not meet the purpose and need transportation goal of addressing congestion, safety, and mobility, eliminating this alignment as an option. In addition, this alternative would substantially impact subdivisions.

Alternative E: This alignment would not meet the safety and mobility criterion as there are too many horizontal curves. Therefore, it would not meet the purpose and need in providing a route that addresses congestion, safety, and mobility. Additionally, there would be substantial impacts to subdivisions, Mutual Materials, Barberton Industrial Park, and a church, which would make this alternative very expensive due to the ROW costs. Therefore, this alternative would not meet the purpose and need in terms of providing a context-sensitive design by limiting impacts to existing developments. This alignment was also eliminated due to its interference with the railroad tracks near 72nd Avenue.

Alternative G: This alignment would not serve local land use well. The alignment would severely impact existing subdivisions and a church. Additionally, the alternative would fragment existing high quality wetlands and impact existing wetland mitigation sites. Therefore, this alternative would not meet the purpose and need in terms of providing a context-sensitive design by limiting impacts to natural resources.

Alternative H: This alignment would fragment existing high quality wetlands and would therefore not meet the purpose and need for limiting impacts to natural resources. Additionally, the alternative would include the construction of a new tunnel under I-205, which would have severe drainage and constructibility issues.

Alternative I: This alignment impacts six wetlands and bisects an existing wetland mitigation site. In addition, this alternative would require the construction of a new tunnel under I-205, which would have severe drainage and constructibility issues. This alternative was excluded because of the degree of environmental impacts and constructibility issues.

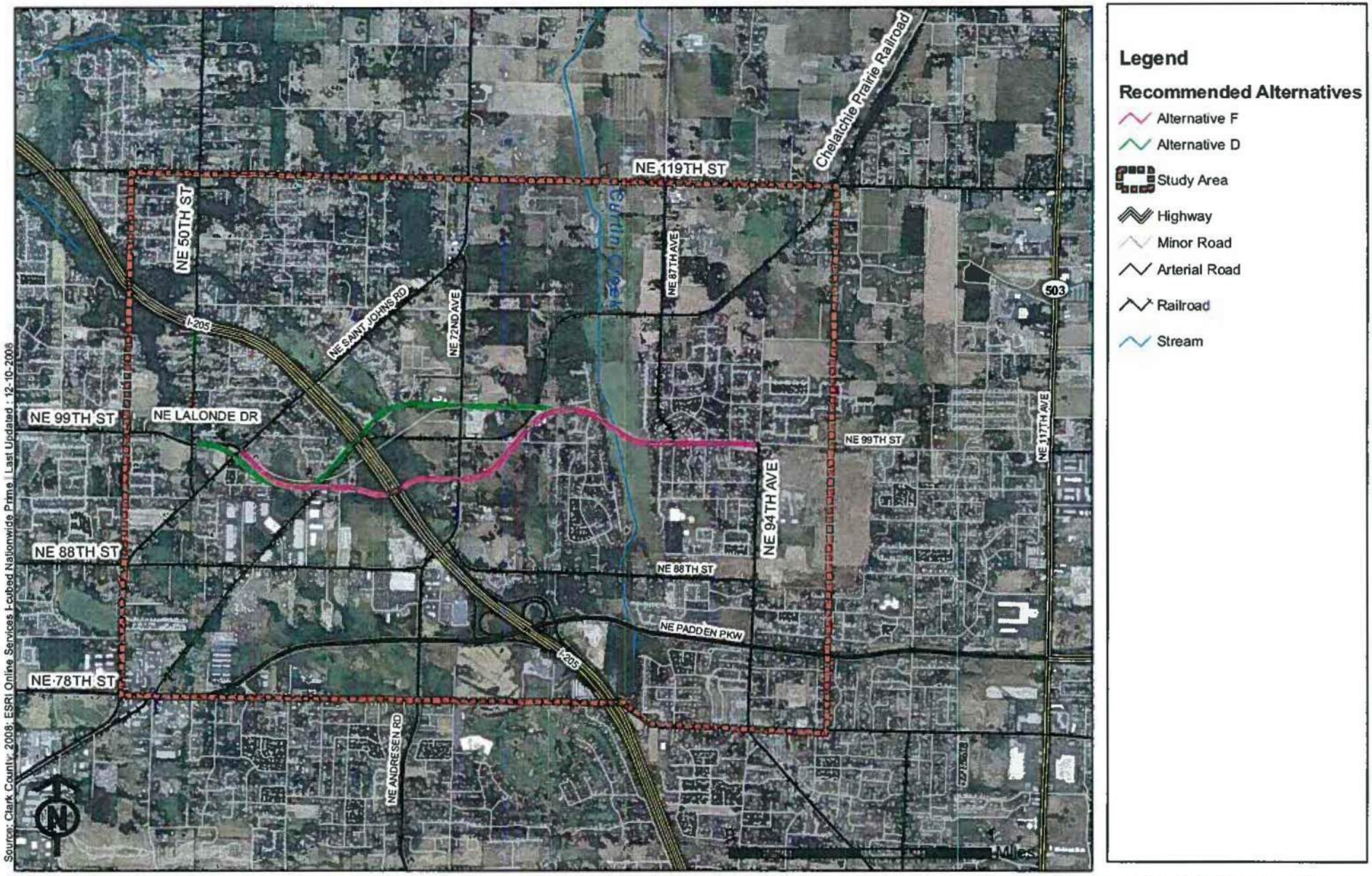
Alternative J: While this alternative has the most direct alignment, due to the poor intersection alignment with NE St. Johns Road it does not meet the purpose and need in providing a route that addresses congestion and mobility. The alternative would substantially impact Mutual Materials and Barberton Industrial Park, which would make this alternative very expensive due to the ROW costs. The alternative would require the construction of a major expansion of the existing tunnel under I-205, which would have severe constructibility issues. In addition, interference with the railroad tracks near NE 72nd Avenue lead this alternative to be eliminated.

Alternatives Recommended for Further Evaluation

The two highest ranking alternatives were selected as preferred alternatives that met transportation goals while limiting impacts to natural resources and the built environment. The Project Team recommends that these two alternatives be considered for further analysis in future NEPA documentation. These alternatives include, in ranked order, Alternative D and Alternative F (Table 4 and Figure 5). The goal was to have two reasonable alternatives that could be compared and contrasted in more detail during the next phase of analysis. The two remaining alternatives include an option to expand an existing tunnel under I-205 and an option to construct a new bridge over I-205.

Alternative D: This alternative is the only route that would utilize the existing tunnel without a major expansion. The alternative also avoids Mutual Materials and Barberton Industrial Park. Additionally, by using the existing ROW in subdivision D, this alternative would not impact an existing mitigation site.

Alternative F: This alternative would require a bridge over I-205. Of the alternatives requiring a bridge over I-205, this alternative had the least overall impacts.



Recommended Alternatives

FIGURE 5

Conclusion/Recommendations

NEPA requires agencies to explore and objectively evaluate a range of alternatives in their environmental documents. The alternative analysis performed by Clark County identified two reasonable alternatives for further consideration and comparison in a NEPA environmental document. During the next phase of the process, the alternatives recommended for further evaluation (Alternatives D and F) will be analyzed in more detail. Analysis of a no-build alternative is required by NEPA and will also be analyzed in the next phase.

Alternatives omitted from further analysis either have severe constructibility issues or do not fully meet the purpose and need of the project in comparison to the two alternatives recommended for further consideration. While other alignment options could be considered during the preparation of future NEPA documents, this alternatives analysis provides a rationale for omitting the alternatives not selected for further evaluation.

The next phase of this project will include the following:

- Preparation and issuance of a draft NEPA environmental document:
  - Analysis of the no-build alternative, alternatives recommended for further consideration in this report, and potential additional suggested alternatives.
  - Analysis of impacts for each alternative considered.
  - Determination of impact mitigation measures.
  - Selection of a preferred alternative.
  - Interagency coordination.
  - Public involvement.

Public involvement will be an early and continuing part of the project development process. The public and other agencies and organizations will also have an opportunity to review and comment on the draft NEPA environmental document during the NEPA public scoping process. This alternatives analysis document will be referenced during the NEPA public scoping process as the basis for selecting the alternatives for further evaluation (i.e., alternatives D and F) and will be available for public review (FHWA, 2005).

References

Clark County

2007 Clark County 20-Year Comprehensive Growth Management Plan 2004-2024. Adopted September 2007.

2007 2008-2013 Clark County Transportation Improvement Program. November 2007.

2008 Public Works Engineering Program. NE 99th Street: NE 72nd Avenue to 94th Avenue Preliminary Alignment Analysis PowerPoint. April 11, 2008.

Federal Highway Administration (FHWA)

2005 Integration of Planning and NEPA Process Memorandum. February 22, 2005.

Carick, Traci

From: Washington, Robin
Sent: Wednesday, May 18, 2011 1:39 PM
To: Carick, Traci
Subject: FW: 99th Street

FYI

From: Abraham, Fred
Sent: Tuesday, September 15, 2009 8:20 AM
To: Washington, Robin
Cc: Capell, Peter; Henderson, Heath
Subject: 99th Street

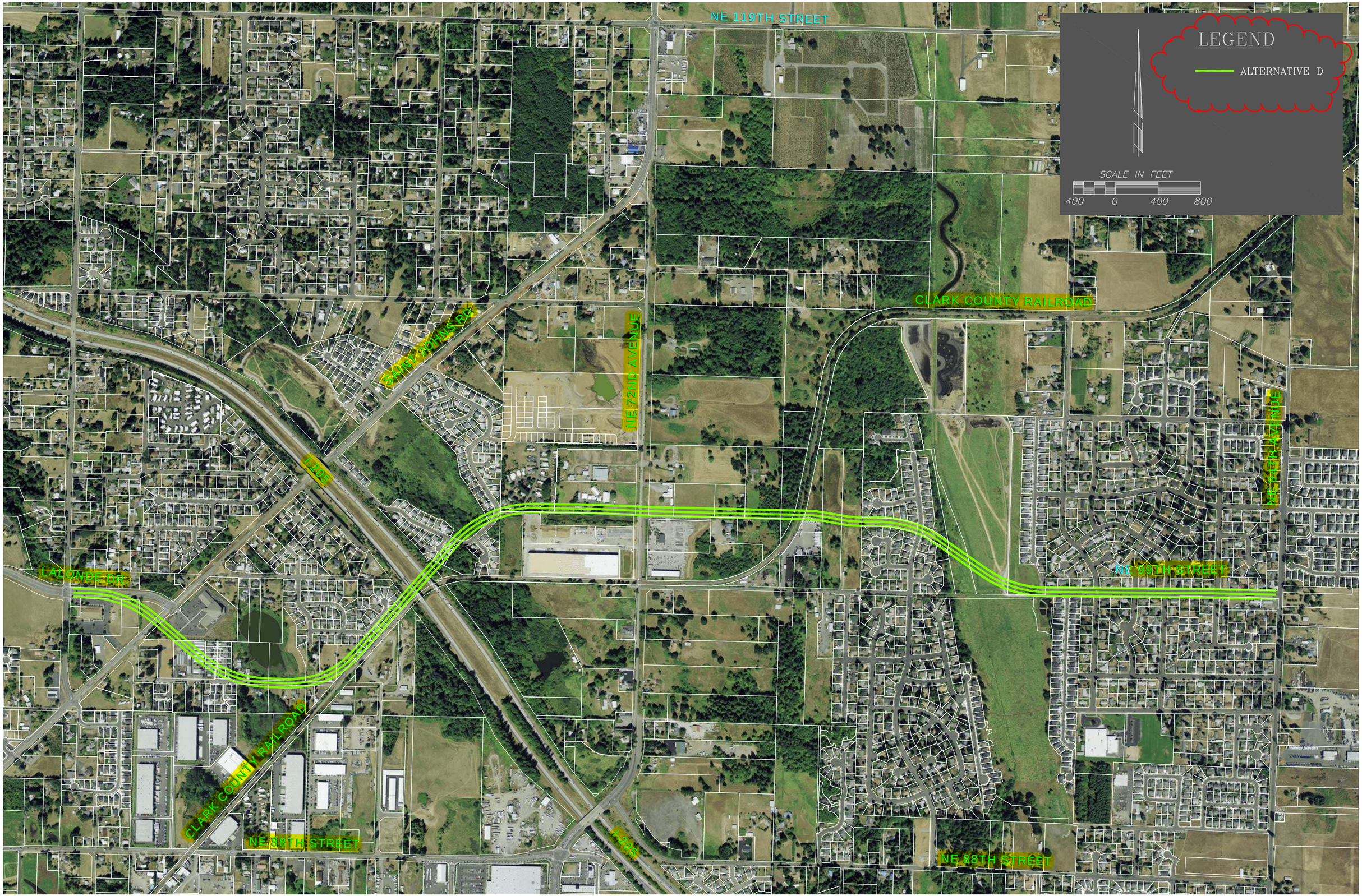
Good morning Robin:

I had a meeting yesterday with Commissioner Boldt and then briefly with Commissioner Mielke. One of the topics was discussing the 99th Street alignment connection options. I indicated that the "green" lined alternative was the most acceptable for this connection so as not to constrict Eric Temple's transloading operation. I also indicated that the proposed alignment would lend itself better to the potential development of adjacent property for rail served businesses. He indicated he would discuss with the other two commissioners in executive session in the near future.

The last thing we discussed is future alignments. He is aware that due to potential rail constraints, potential traffic issues as well the FRA's (Federal Railway Administration) concerns for crossings, that we need to reduce the amount of at-grade crossings in all future road considerations. I know that this may not always be able to be done, however as much as possible we need to consider incorporating over or under crossings, not at-grade. Both were in agreement on this. I don't know if this proposed alignment connection can be considered as a candidate for an over or under crossing, but if it can it would be greatly appreciated.

Regards,
Fred

Fred Abraham
Railroad Coordinator
General Services
P.O. Box 9810, Vancouver WA 98666
telephone: 360.397.2323 ext 4113
fax: 360.759.7929 cell: 360.852.6577
www.clark.wa.gov


NE 119TH STREET
LEGEND
ALTERNATIVE D
SCALE IN FEET
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CLARK COUNTY RAILROAD
SAINT JOHNS RD
NE 72ND AVENUE
I-205
LALONDE DR
NE 88TH STREET
NE 88TH STREET
NE 88TH STREET
NE 88TH STREET

Appendix A
Alternatives Evaluation Matrix

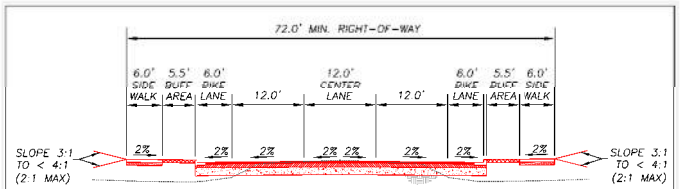
Clark County NE 99th Street (NE St. Johns Road to NE 94th Avenue)
Alternatives Evaluation Matrix

Evaluation Criteria	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
	Does the alternative meet the criteria Yes/No or Impact Value	Comments	Does the alternative meet the criteria Yes/No or Impact Value	Comments	Does the alternative meet the criteria Yes/No or Impact Value	Comments	Does the alternative meet the criteria Yes/No or Impact Value	Comments	Does the alternative meet the criteria Yes/No or Impact Value	Comments
Purpose and Need	No		Yes		Yes		Yes		Yes	
Purpose and Need Statement	No	Very good alignment in general except for the fact that it does not fulfill the purpose and need of the project in completing east-west circulation between Lalonde and 72nd Ave. The separation between proposed new intersection and Lalonde is about 1800 feet, which is probably excessive to compensate via other treatments.	Yes		Yes		Yes		Yes	
Transportation										
Traffic/Transportation	No	Does not serve local land use. Too far from Lalonde intersection to serve as route for I-5 traffic. Not a direct route so would still have congestion on other east-west connections. Not convenient route so alternative routes would be sought.	Yes	Good connection to Lalonde and St Johns Road intersection. Utilizes existing 99th St. corridor east of 87th Ave. 99th St. corridor east of 87th Ave. Utilizes existing ROW in subdivision D.	Yes	Generally good alignment from a traffic perspective. Merges with Lalonde St. alignments at a flatter radius, allowing smoother traffic flow at design speed. Intersects St. Johns at 90 degrees, making the intersection more efficient. Would serve local land use well. Utilizes existing 95th St. corridor. Utilizes existing 99th St. corridor. Utilizes existing roadways and railroad alignment.	Yes	Reasonably good alignment. Good connection to Lalonde and St. Johns Rd. intersection. Utilizes existing 99th St. east of 87th Ave. 99th St. corridor east of 87th Ave. already in place. Utilizes existing ROW in subdivision D.	Yes	Good connection to Lalonde and St. Johns Rd. intersection. Utilizes existing 99th St. east of 87th Ave. 99th St. corridor east of 87th Ave. already in place. Utilizes existing ROW in subdivision D.
Safety and Mobility	Yes	Best safety alignment. Minimal horizontal curves. Potential for access management.	No	Too many horizontal curves in alignment. Too curvilinear with many short and sharp curves. The curve at the existing west approach of 99th St. (Lalonde) may be too sharp for the design speed. Potential for access management up to Barberton Industrial Park. Access through Barberton Industrial Park is a major issue. If there are direct accesses on subdivisions D and E and 99th St., access management and backing out of driveways would be an issue.	Yes	Least number of and gentler curves in alignment. If there are direct accesses on 99th St., access management and backing out of driveways would be an issue in subdivisions D and E.	Yes	Less circuitous alignment then alternative B. Curve at existing west approach of 99th St. (Lalonde) may be too sharp for design speed. Good potential for access management. If there are direct accesses on subdivisions D and E and 99th St., access management and backing out of driveways would be an issue.	No	Too many horizontal curves in alignment. Curve at existing west approach of 99th St. (Lalonde) may be too sharp for the design speed. Good potential for access management. If there are direct accesses on subdivisions D and E and 99th St., access management and backing out of driveways would be an issue.
Multi-modal	Yes	Meets requirements.	Yes	Meets requirements.	Yes	Meets requirements.	Yes	Meets requirements.	Yes	Meets requirements.
Category Ranking	5		6		7		3		7	
Natural Resources										
Streams (Curtin Creek)	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.
ESA Species/Habitat (Curtin Creek)	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.
Shorelines (Curtin Creek)	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.
Wetlands (acres)	3.89	Least impacts to high quality wetlands. Impacts 4 wetlands; 1 high quality wetland.	6.78	Impacts 5 wetlands; 3 high quality wetlands.	6.99	Impacts 4 wetlands; 2 high quality wetlands.	5.41	Impacts 6 wetlands; 3 high quality wetlands.	7.03	Impacts 6 wetlands; 4 high quality wetlands.
Flood Zones (proposed floodplains, flood area, floodway) (Curtin Creek)	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.	Same as others.	Could potentially impact this resource.
Mitigation Areas (existing or proposed for other projects)	Yes	Utilizes current ROW in Curtin Creek Enhancement Area (CCEA).	No	Impacts Barberton stormwater facilities. Utilizes current ROW in CCEA.	No	Impacts WSDOT SR 502 mitigation site on the north boundary and CCEA on the south boundary.	Yes	Borders Barberton stormwater facilities on north boundary. Utilizes current ROW in CCEA.	No	Impacts Barberton stormwater facilities. Utilizes current ROW in CCEA.
Category Ranking	1		6		3		4		5	
Built Environment Resources										
Residential (acres)	6.30		8.97		7.98		9.44		8.96	
Residential Relocations	27	Impacts residences in Village on the Glen.	36	Impacts subdivisions A, B ,and C.	41	Impacts subdivisions A, D, and F.	42	Impacts subdivisions A, B, and C.	35	Impacts subdivisions A, B, and C.
Residences Purchased/Resold	46		56		47		64		46	
Industrial/Commercial (acres)	4.60		6.81	Bifurcation of Barberton Industrial Park.	8.11		6.58		6.79	
Industrial/Commercial Relocations	0	None identified.	3	Impacts Barberton Industrial Park structures.	0		0	None identified.	3	Impacts Mutual Materials and Barberton Industrial Park structures.
Socioeconomic Resources	0	None identified.	1	Partially impacts church structure.	1	Partially impacts church property.	1	Partially impacts church property.	1	Partially impacts church structure.
Historic and Cultural Resources	0	None identified.	0	None identified.	0	None identified.	0	None identified.	None identified	None identified.
Potential Hazardous Material Sites	0	None identified.	0	None identified.	1	Precision Paving.	0	None identified.	1	Mutual Materials Company.
Category Ranking	8		10		1		7		9	
Cost										
Wetland Mitigation Cost	$6,920,231		$12,021,664		$12,195,295		$12,060,518		$14,303,592	
ROW Cost	$8,324,353		$23,211,393		$11,416,691		$12,463,514		$22,225,149	
Construction Cost	$16,152,085		$23,913,478		$27,285,689		$24,144,273		$23,870,357	
Total Cost	$31,396,669		$59,146,535		$50,897,675		$48,668,306		$60,399,098	
Category Ranking	1		8		4		2		10	
Constructibility										
Road Length (feet)	8,390		11,385		11,859		11,515		11,371	
Bridge/Tunnel Requirements	0	None identified.	1	Uses existing tunnel under I-205.	1	Requires 80-foot-wide tunnel under I-205. Low point under tunnel may be difficult to drain.	1	Requires expansion to an existing tunnel under I-205.	1	Uses existing tunnel under I-205.
Railroad Impacts	1 at-grade crossing required.	Far from railroad intersection at 72nd Ave.	1 at-grade crossing required.	Far from railroad intersection at 72nd Ave.	1 additional at-grade crossing required.	Crosses railroad track at an angle. Signalization at intersection with 72nd Ave. will be a challenge due to close proximity with the railroad track. Operationally deficient due to interruption of traffic flow.	1 at-grade crossing required.	Far from railroad intersection at 72nd Ave.	1 additional at-grade crossing required.	Poor intersection arrangement at 72nd Ave.
Wetland Mitigation (acres)	46.13		80.14		81.30		80.40		96.36	
Category Ranking	1		5		10		2		6	
Weighted Score	33		58		62.5		35.5		72.5	
Alternative Ranking	ELIMINATED DUE TO P&N		7		6		1		8	

Alt. D
Total cost = $48,668,306

APPENDIX B:

Overall Plan



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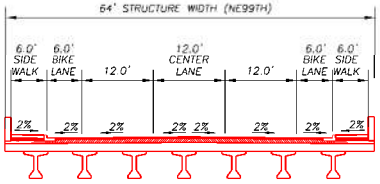
NE 99TH STREET PROPOSED ROADWAY



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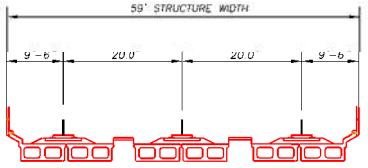
NE 99TH STREET PROPOSED BRIDGE



SECTION C-C
RAILROAD BRIDGE OVER PROPOSED ROADWAY

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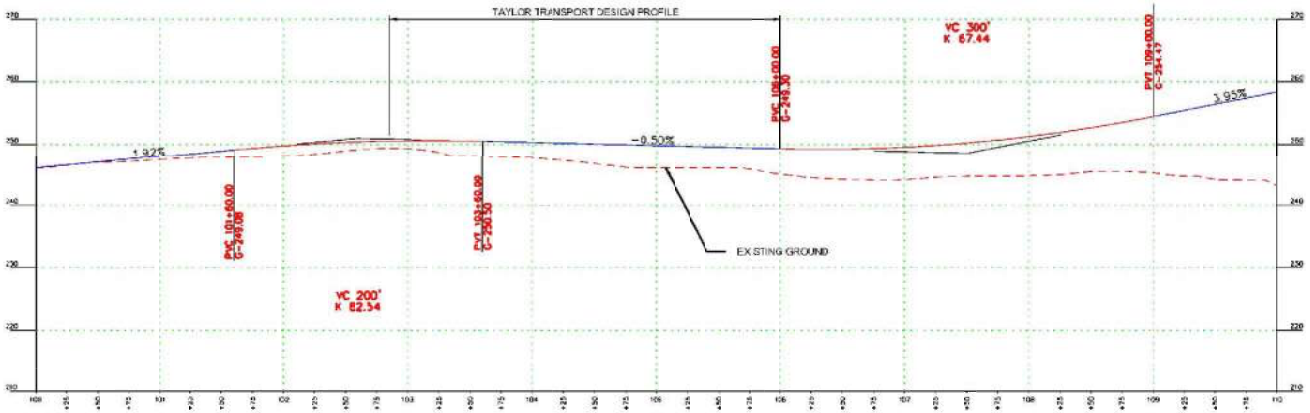
APPENDIX C:

Alternative D – Overpass



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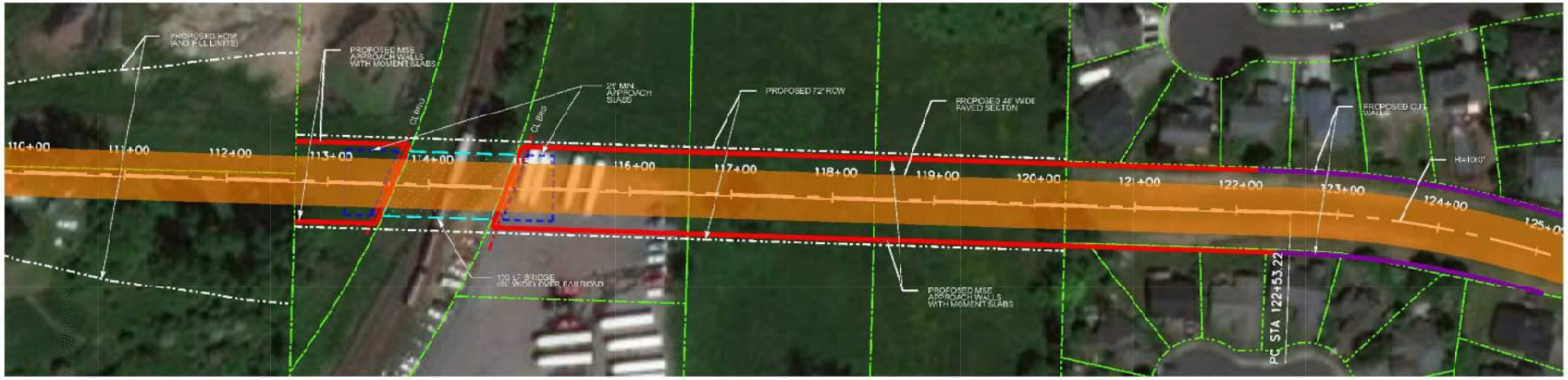

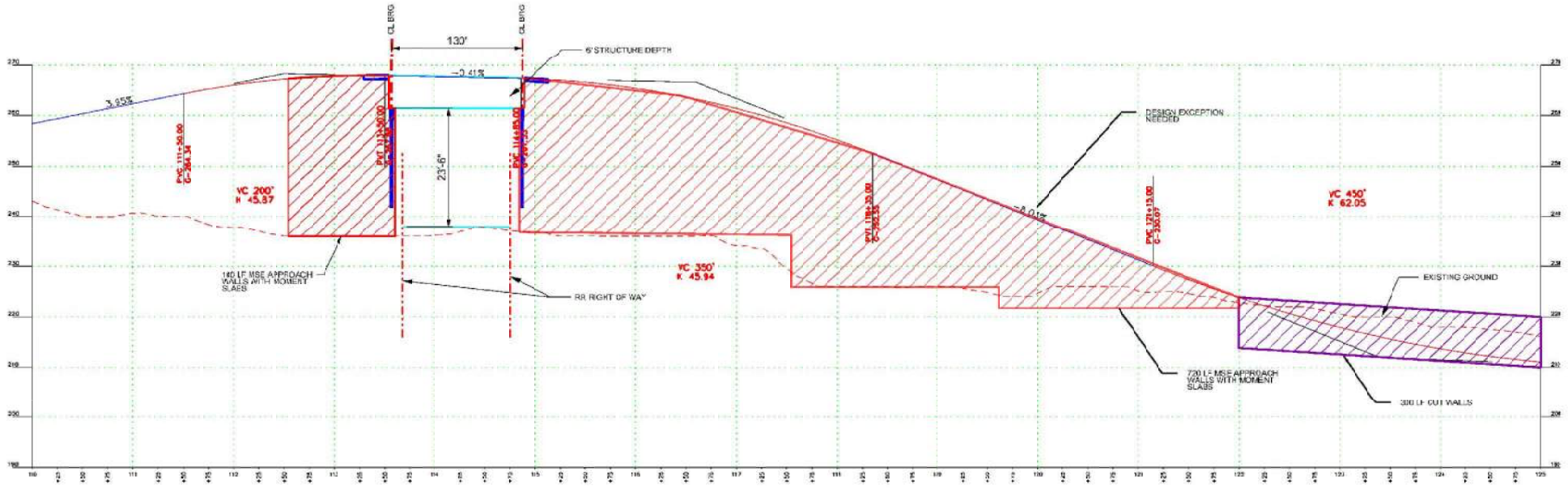

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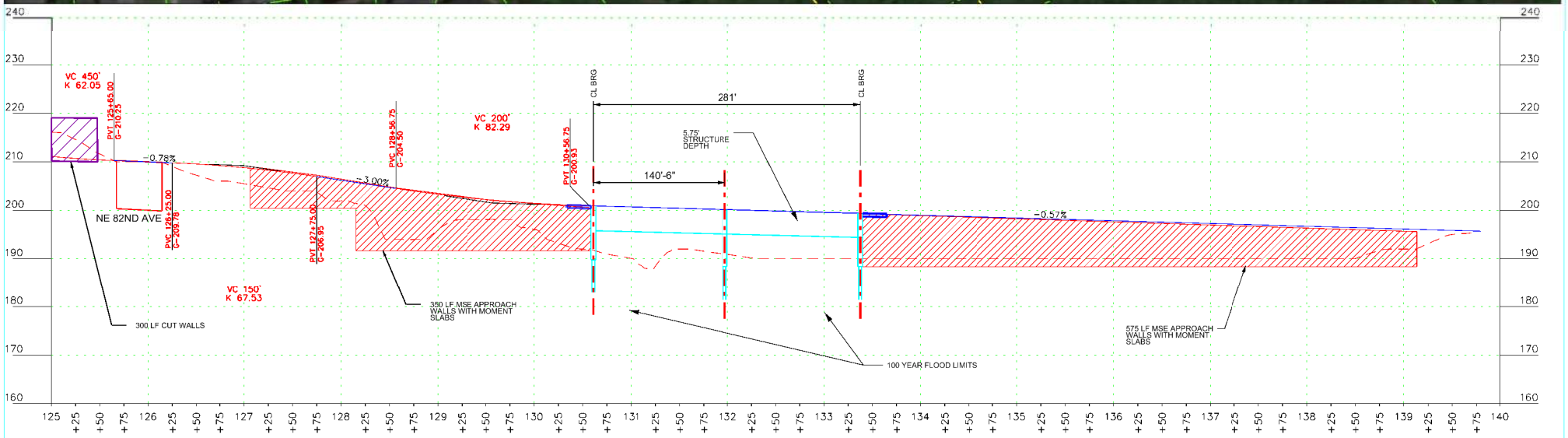

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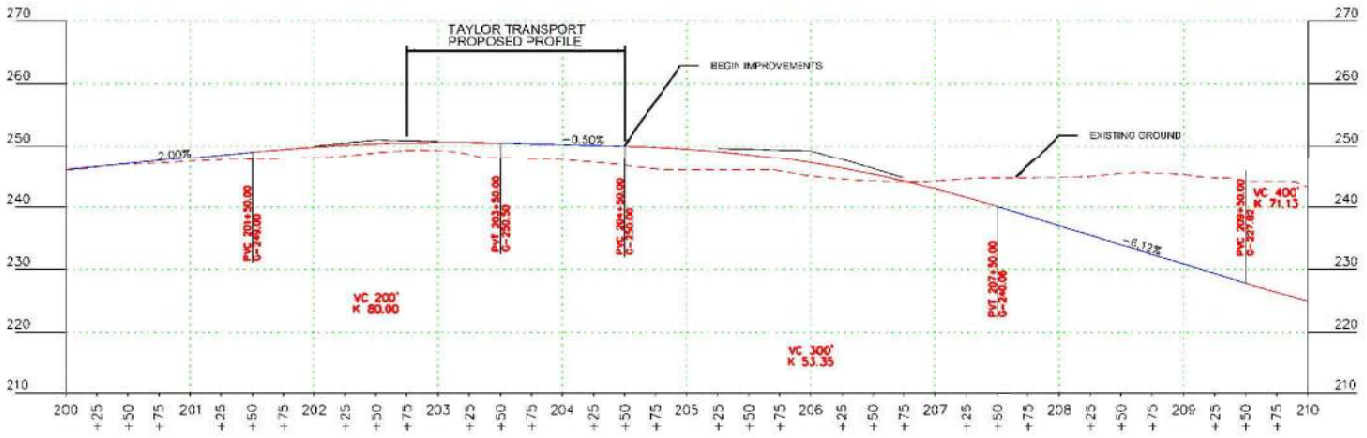
APPENDIX D:

Alternative D – Underpass



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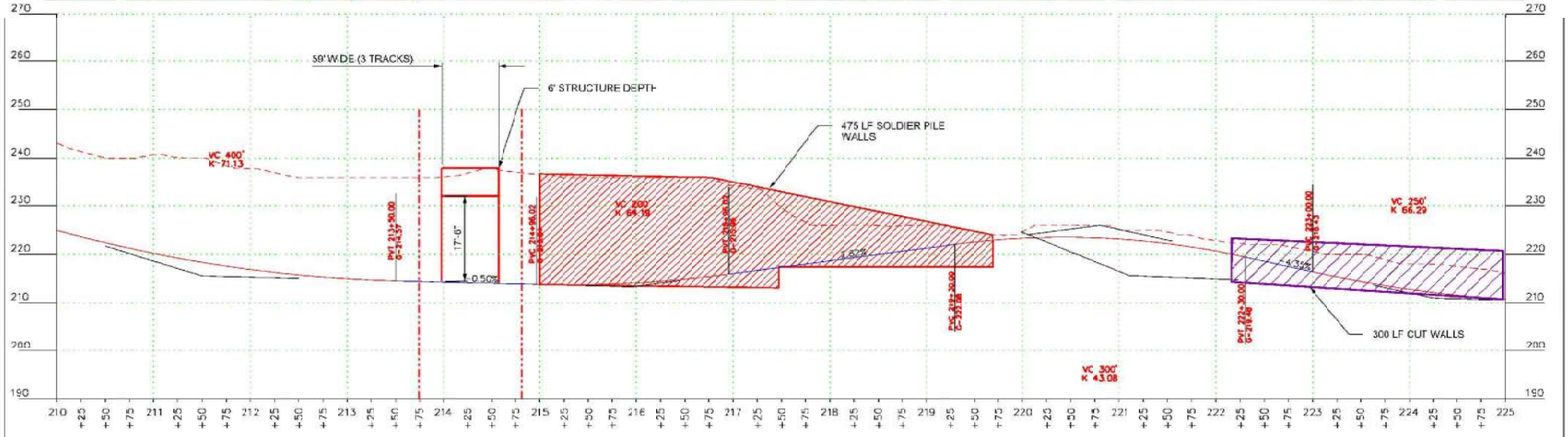

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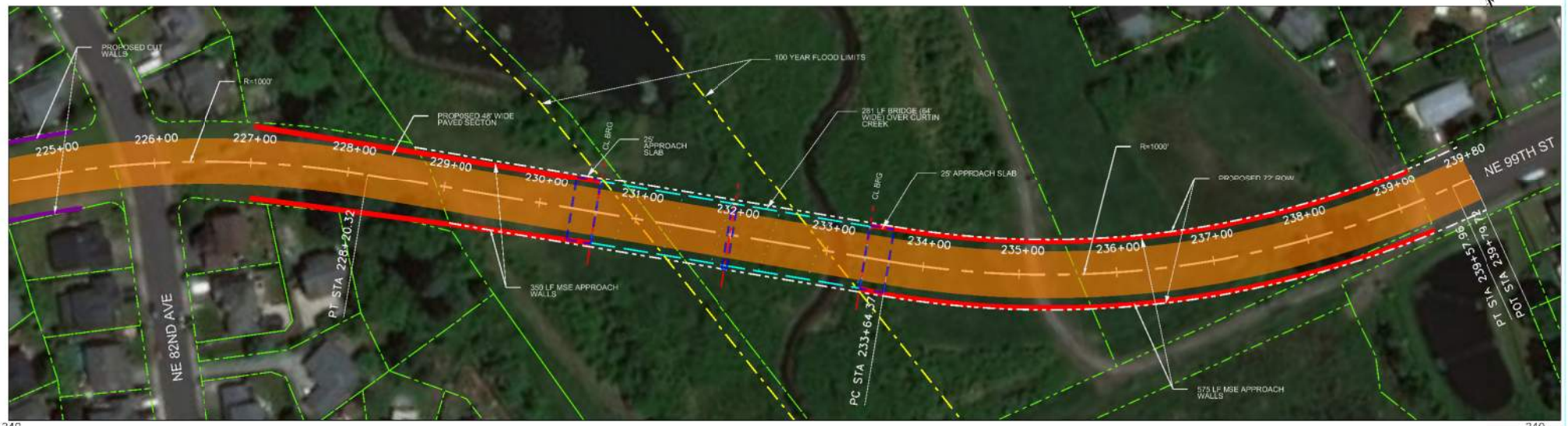

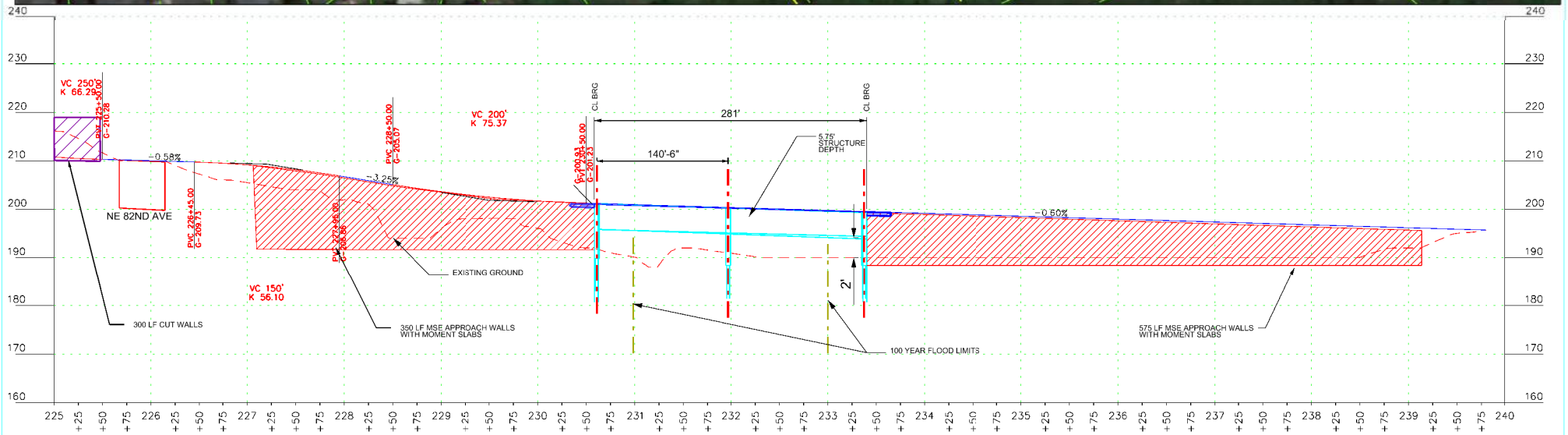

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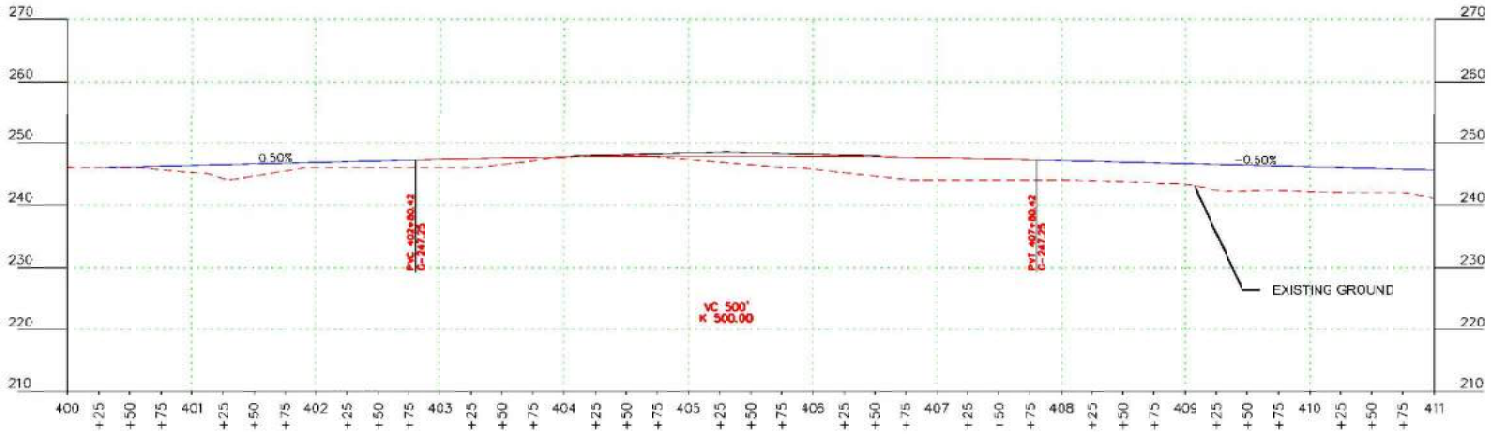
APPENDIX E:

Alternative F



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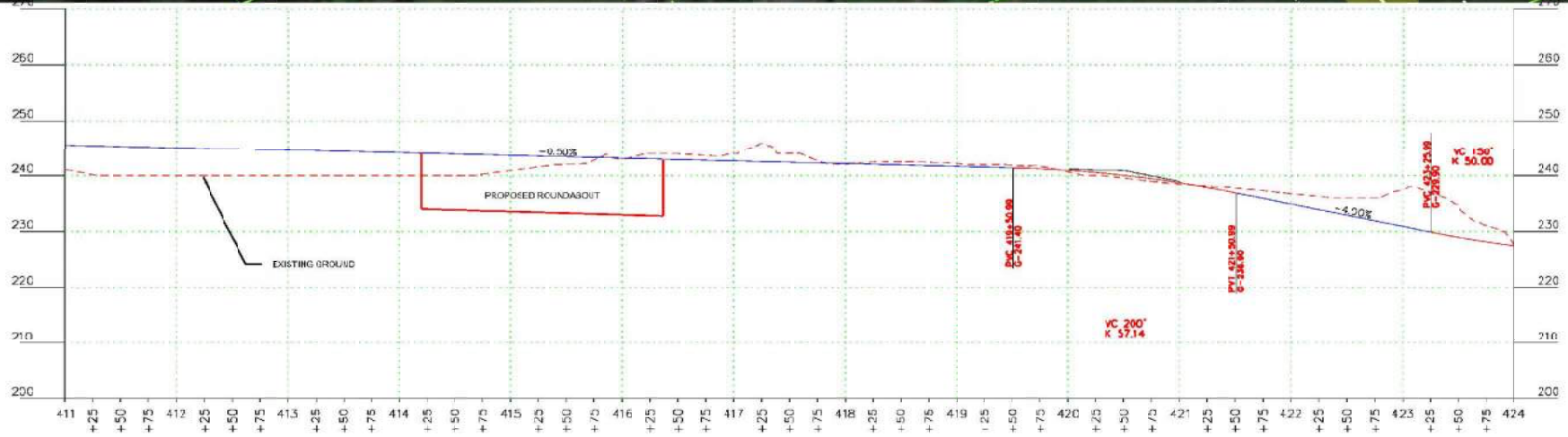

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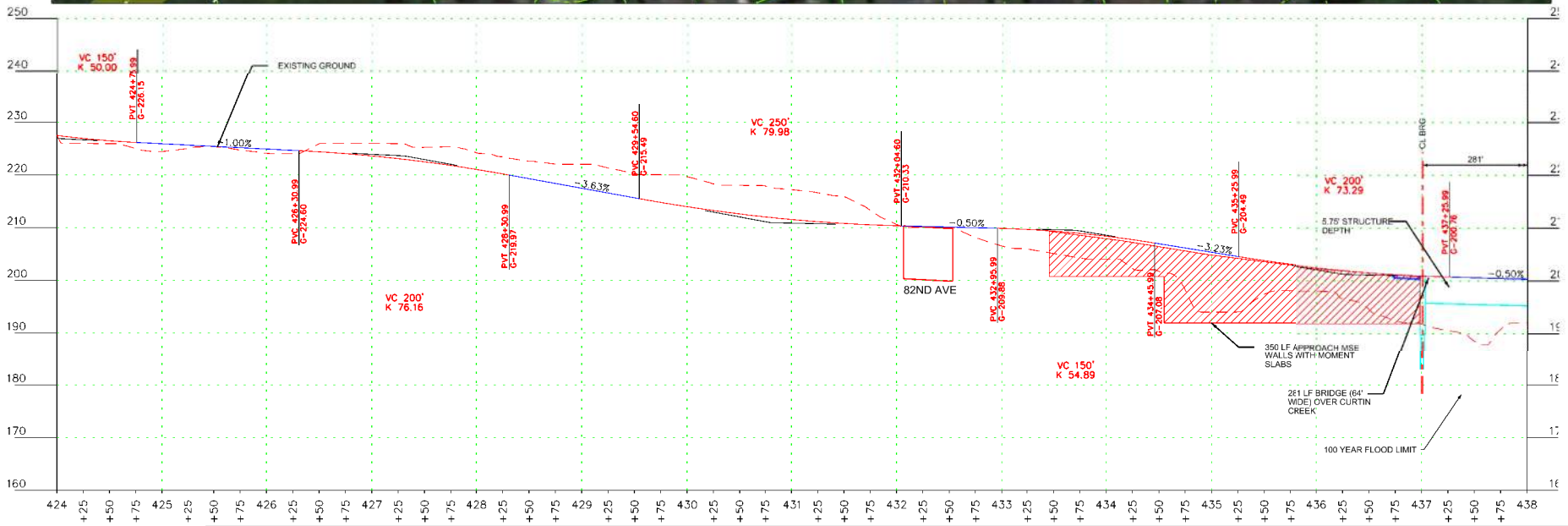

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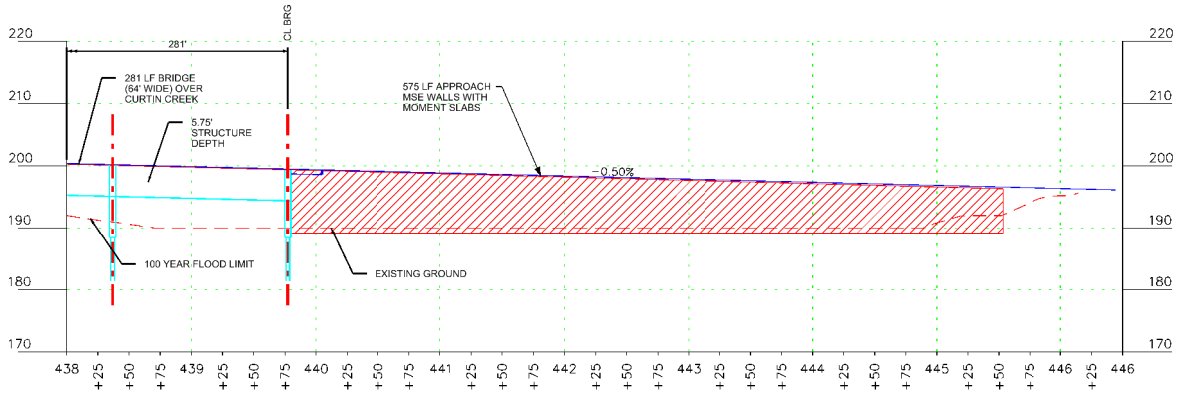

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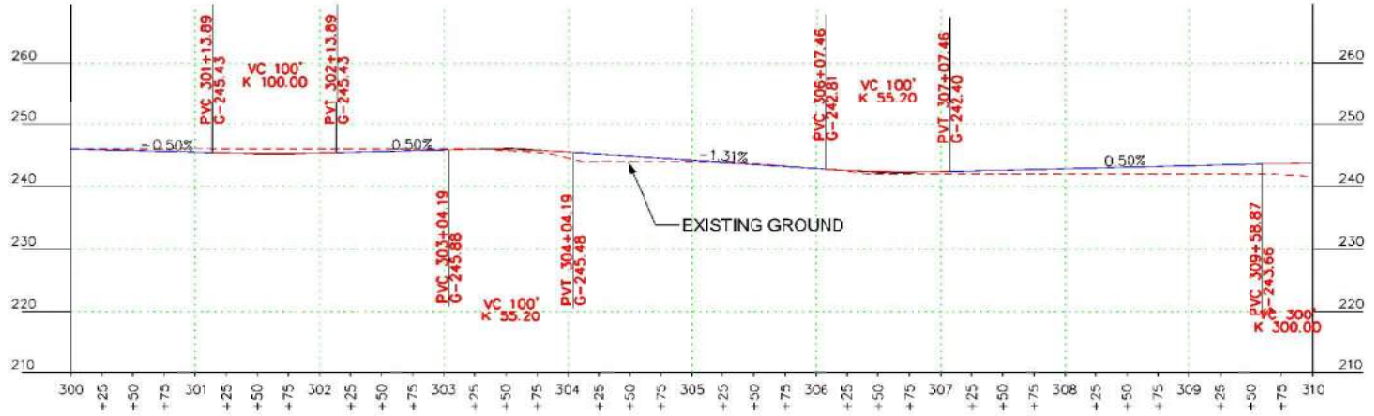
APPENDIX F:

Alternative J



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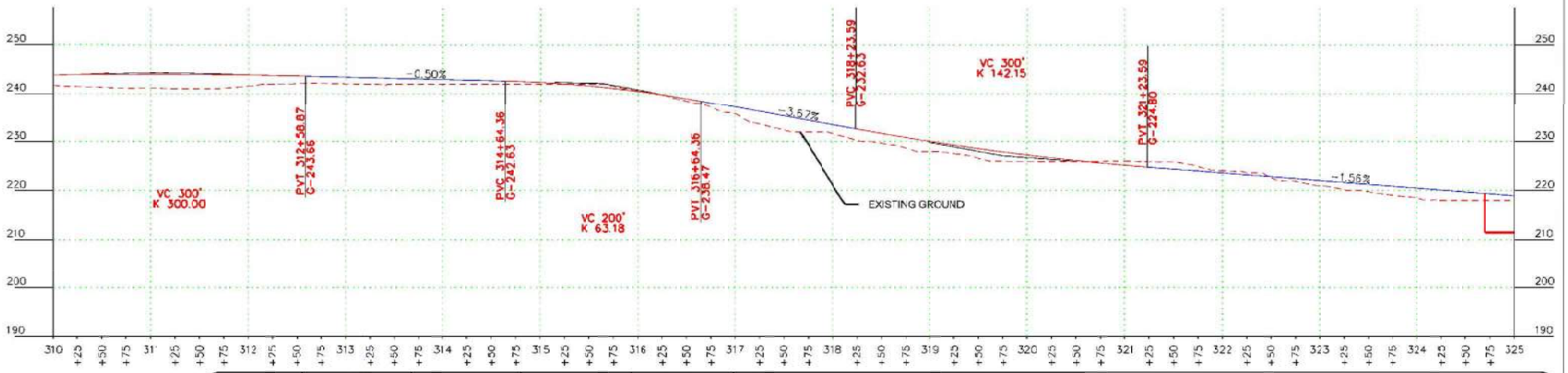

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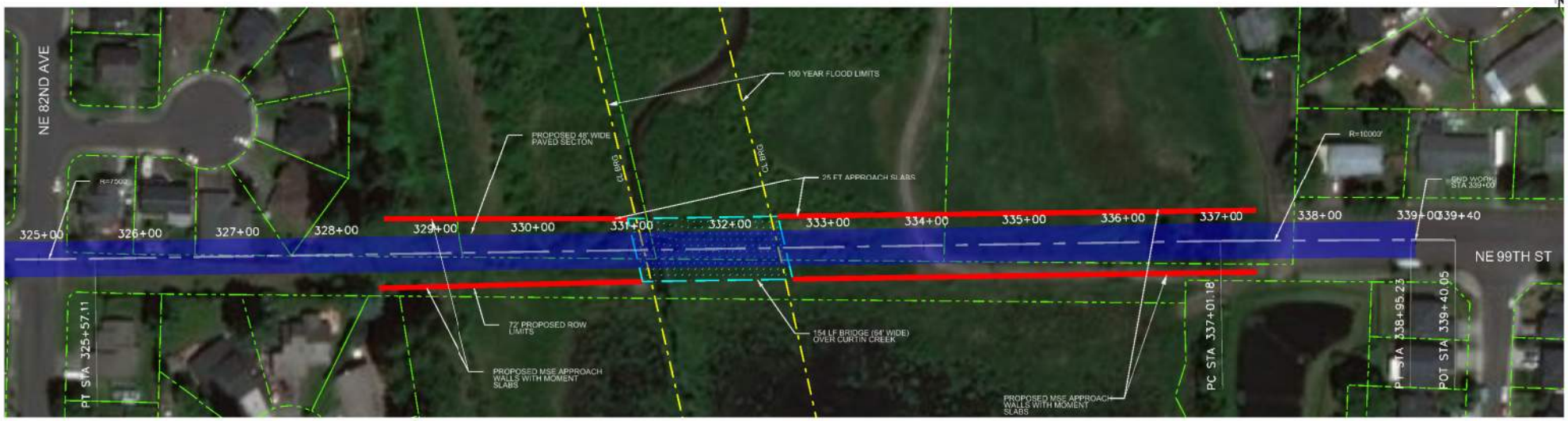

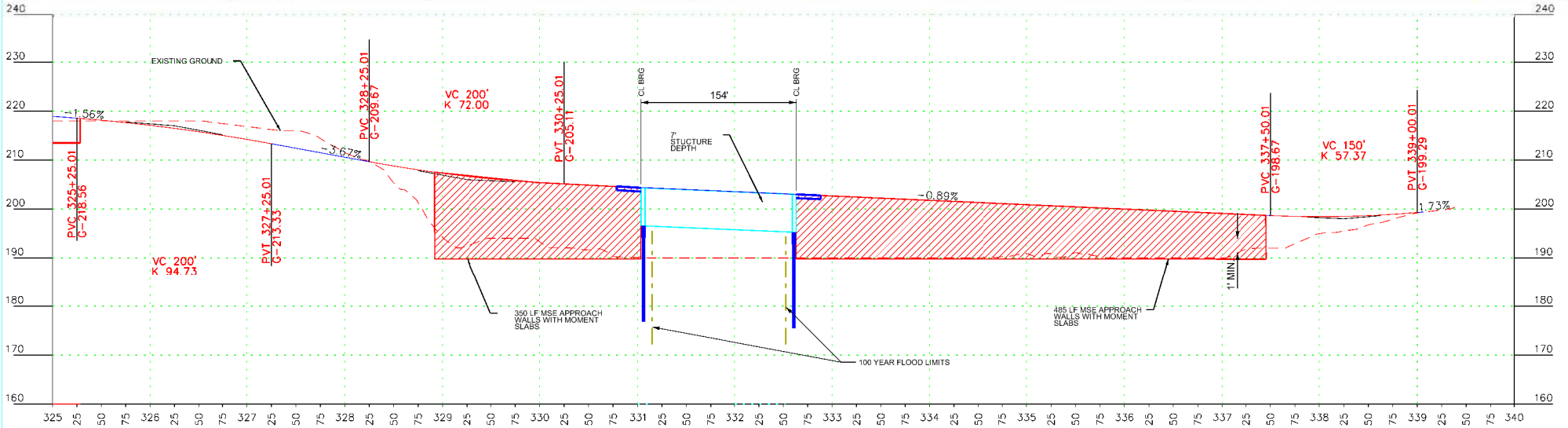

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APPENDIX G:

ROW Impacts Lists

Impacted Properties

County Owned
Possible Displacement(s)

Alternative D with Overcrossing/Undercrossing of Clark County Railroad*

Property ID	Owner	Situs Address	Zone	Current Use
119490000	Mutual Materials Company	10019 NE 72nd Ave.	IL	Mutual Materials (masonry supply store)
119510000 119535000	Pioneer Industrial LLC	7416 NE 101st St.	IL	Vacant
119501000	Pun LLC	7503 NE 101st St.	IL	National Transfer Inc. and possible SFR
119520000 199392000	Gatach Properties LLC	7604 NE 101st St.	IL	Vacant
119480000	Scott E. Buchanan	7511 NE 101st St.	IL	SFR
300002000	Clark County General Services- Railroad		All	RR
199394000	Grandview Investment Holdings LLC	7708 NE 99th St.	IL	General Industrial Park
199398000	Grandview Investment Holdings LLC	7818 NE 99th St.	R1-6	Vacant
199391000	Harold & Elizabeth Hass, Trustee	7904 NE 99th St.	R1-6	Abandoned SFR
105612834	Clark County Public Works		R1-6	Vacant
105612836	Clark County Public Works		R1-6	Abandoned driveway
105612830	Larry Boitano Builder LTD		R1-6	Vacant
105612828	Larry Boitano Builder LTD		R1-6	Vacant
155570000	Clark County Public Works		R1-6	Vacant
155546000	Clark County Clean Water Program		R1-6	Vacant Wetland
155572110	Clark County Clean Water Program	10398 NE 86th Ave.	R1-6	Vacant

*Both Overcrossing and Undercrossing alternatives impact the same properties

Alternative F

Property ID	Owner	Situs Address	Zone	Current Use
155753000	Christl A. Gabrielsen	9501 NE 72nd Ave.	IL	SFR
155754000	Shane & Sarah Hu	9607 NE 72nd Ave.	IL	SFR
155755000	Jacob Logistics Inc.	9703 NE 72nd Ave.	IL	Vacant
155781000 155758000	Ferox Properties Inc.	7705 NE 99th St.	IL	SFR
119500000	Raymond & Margaret Bloomquist, Trustees	7510 NE 99th St.	IL	Industrial/commercial
199413000	Troy & Sabine Summerhill	7800 NE 99th St.	IL	SFR
199472000 199394000	Grandview Investment Holdings LLC	7708 NE 99th St.	IL	Grandview Enterprises Industrial Park
199398000	Grandview Investment Holdings LLC	7818 NE 99th St.	R1-6	Vacant
199391000	Harold & Elizabeth Hass, Trustee	7904 NE 99th St.	R1-6	Abandoned SFR
105612834	Clark County Public Works		R1-6	Vacant
105612836	Clark County Public Works		R1-6	Abandoned driveway
105612830	Larry Boitano Builder LTD		R1-6	Vacant

105612828	Larry Boitano Builder LTD		R1-6	Vacant
155570000	Clark County Public Works		R1-6	Vacant
155546000	Clark County Clean Water Program		R1-6	Vacant Wetland
155572110	Clark County Clean Water Program	10398 NE 86th Ave.	R1-6	Vacant

Alternative J

Property ID	Owner	Situs Address	Zone	Current Use
300002000	Clark County General Services- Railroad		All	RR
119500000	Raymond & Margaret Bloomquist, Trustees	7510 NE 99th St.	IL	Industrial/commercial
199472000	Grandview Investment Holdings LLC	7708 NE 99th St.	IL	General Industrial Park
199413000	Troy & Sabine Summerhill	7800 NE 99th St.	IL	SFR
199398000	Grandview Investment Holdings LLC	7818 NE 99th St.	R1-6	Vacant
199391000	Harold & Elizabeth Hass, Trustee	7904 NE 99th St.	R1-6	Abandoned SFR
105612744	Larry Boitano Builder LTD		R1-6	Vacant/driveway
105612662	Lenny & Yekaterina Giesbrecht	8002 NE 99th St.	R1-6	SFR
105612664	Laurie M. Thomas	8008 NE 99th St.	R1-6	SFR
105612666	David & Patrice Weible	8014 NE 99th St.	R1-6	SFR
105612668	June R Carlson, Trustee	8104 NE 99th St.	R1-6	SFR
105612670	Gabriela Warczak	8110 NE 99th St.	R1-6	SFR
105612742	Larry Boitano Builder LTD		R1-6	Vacant
105612724	Richard & Michele Gordon	8203 NE 99th Cir.	R1-6	SFR
105612726	Donald & Brenda Boitano	8207 NE 99th Cir.	R1-6	SFR
105612728	Leland Brown	8211 NE 99th Cir.	R1-6	SFR
105612730	James & Nancy Pittman	8215 NE 99th Cir.	R1-6	SFR
105612740	Larry Boitano Builder LTD		R1-6	Vacant
155570000	Clark County Public Works		R1-6	Vacant
155546000	Clark County Clean Water Program		R1-6	Vacant Wetland
155572110	Clark County Clean Water Program	10398 NE 86th Ave.	R1-6	Vacant
155537166	Clark County Clean Water Program		R1-6	Vacant/storm water pond
155537174	Washington State		R1-6	Vacant Wetland
105614340	Pamela Lynn Ragan	9801 NE 83rd Ct.	R1-6	SFR
105614342	Michael & Brenda Thompson	9803 NE 83rd Ct.	R1-6	SFR
105614344	Timothy & Nicole Devine	9802 NE 83rd Cir.	R1-6	SFR
105614382	Charles Munn	9805 NE 82nd Ave.	R1-6	SFR
105614264	Charles & Brandi Mott	9806 NE 82nd Ave.	R1-6	SFR
105614394	Jon & Michelle Major	9807 NE 91st Ct.	R1-6	SFR
105614396	Larry A. Bunnell	9808 NE 81st Ct.	R1-6	SFR
105614398	Scott & Angela Tilgner	9806 NE 81st Ct.	R1-6	SFR
105614400	Robert & Debra Harris	9804 NE 91st Ct.	R1-6	SFR
105614482	Mary & Donald Lund	9813 NE 80th Ave.	R1-6	SFR
105614434	Kerry & Matthew Barton	9812 NE 80th Ave.	R1-6	SFR
155776000	Norman & Sandra Prouty	7815 NE 99th St.	R1-6	SFR
155759000	Clint Nelson	7803 NE 99th St.	R1-6	SFR
155763000	Phiip Kirkpatrick	7713 NE 99th St.	R1-6	Abandoned SFR
155758000	Ferox Properties Inc.	7705 NE 99th St.	IL	SFR
155757000	Ferox Properties Inc.	7311 NE 99th St.	IL	Abandoned SFR
155756000	Larry & Julieta Gibson	7217 NE 99th St.	IL	Frontier Electric

APPENDIX H:

Cost Estimates

Clark County, Washington
NE 99th Extension Feasibility Study
Alternative Cost Comparison

	Construction Cost	Right of Way Costs	TOTAL
Alternative D- Overpass	$19,132,338	$2,253,860	**$21,386,198**
Alternative D- Underpass	$17,921,435	$1,952,011	**$19,873,446**
Alternative F	$13,024,926	$2,951,766	**$15,976,692**
Alternative J	$9,956,327	$4,839,921	**$14,796,248**

Clark County, Washington
NE 99th Extension Feasibility Study
Opinion of Probable Construction Cost
ALTERNATIVE D (Over Railroad)

ITEM NO.	ITEM	UNIT	QUANTITY	QUANTITY CONTINGENCY %	UNIT PRICE	ITEM COST
	SECTION 1: PREPARATION					
0025	Clearing and Grubbing	AC	8	15.0%	$8,500.00	$75,188.51
0050	Removal of Structure and Obstructions	LS	1	20.0%	$50,000.00	$60,000.00
0100	Removing Cement Conc. Sidewalk	SY	2,600	20.0%	$9.33	$29,120.00
0108	Removing Curb and Gutter	LF	260	20.0%	$9.67	$3,016.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$16,732.45
	SECTION SUBTOTAL					$184,056.96
	SECTION 2: GRADING					
0310	Roadway Excavation Incl. Haul	CY	6,919	20.0%	$27.00	$224,160.00
0421	Gravel Borrow Including Haul	CY	116,009	20.0%	$9.00	$1,252,897.00
0470	Embankment Compaction	CY	110,907	20.0%	$2.17	$288,357.57
	CONTINGENCY FOR UNIDENTIFIED ITEMS (3%)					$52,962.44
	SECTION SUBTOTAL					$1,818,377.01
	SECTION 3: STOCKPILING					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 4: DRAINAGE					
	Stream Restoration	LS	1	15.0%	$25,000.00	$28,750.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (20%)					$5,750.00
	SECTION SUBTOTAL					$34,500.00
	SECTION 5: STORM SEWER					
3090	Catch Basin Type 1	EACH	17	15.0%	$3,805.00	$73,950.18
3151	Testing Storm Sewer Pipe	LF	3,380	15.0%	$3.17	$12,308.83
3541	Schedule A Storm Sewer Pipe 12 In. Diam.	LF	3,380	15.0%	$25.00	$97,175.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (25%)					$45,858.50
	SECTION SUBTOTAL					$229,292.51
	SECTION 6: SANITARY SEWER					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 7: WATER LINES					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 8: STRUCTURES					
	Curtin Creek Precast Prestressed WF I-Girder Bridge (Multi-Span)	SF	18309	30.0%	$240.00	$5,712,408.00
	Curtin Creek Approach Slabs	SY	356	30.0%	$400.00	$185,120.00
	Curtin Creek MSE Wall Barrier w/ Moment Slab	LF	1850	30.0%	$400.00	$962,000.00
	Railroad Precast Prestressed WF I-Girder Bridge (Single-Span)	SF	8629	30.0%	$220.00	$2,467,894.00
	Railroad Approach Slabs	SY	522	30.0%	$400.00	$271,440.00
	Railroad MSE Wall Barrier w/ Moment Slab	LF	1640	30.0%	$400.00	$852,800.00
	Cut walls	LF	600	30.0%	$400.00	$312,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$1,045,166.20
	SECTION SUBTOTAL					$11,808,828.20
	SECTION 9: SURFACING					
5100	Crushed Surfacing Base Course	CY	3,672	20.0%	$31.33	$138,067.86
6530	Soil Amendment (Compost Amended Topsoil)	CY	197	15.0%	$32.93	$7,472.30
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$14,554.02
	SECTION SUBTOTAL					$160,094.18
	SECTION 10: LIQUID ASPHALT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 11: BITUMINIOUS SURFACE TREATMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 13: CEMENT CONCRETE PAVEMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 14: HOT MIX ASPHALT					
5711	Planing Bituminous Pavement	SY	1,433	15.0%	$10.67	$17,582.22
5767	HMA CL 1/2" PG 64-22	TON	2,020	15.0%	$103.67	$240,835.51
5769	HMA CL 1" PG 64-22	TON	3,030	20.0%	$142.00	$516,350.25
	CONTINGENCY FOR UNIDENTIFIED ITEMS (5%)					$37,859.29
	SECTION SUBTOTAL					$795,045.04
	SECTION 15: SEAL COAT					
	No items anticipated.					$0.00

	SECTION SUBTOTAL					$0.00
	SECTION 16: IRRIGATION AND WATER DISTRIBUTION					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 17: EROSION CONTROL AND ROADSIDE PLANTING					
6403	ESC Lead	Day	21	15.0%	$428.33	$10,344.25
6488	Erosion Control and Water Pollution Prevention	LS	1	10.0%	$20,000.00	$22,000.00
6414	Seeding, Fertilizing, and Mulching	AC	1.4	20.0%	$5,733.33	$9,718.24
6630	High Visibility Fence	LF	4,240	15.0%	$2.48	$12,108.73
6635	High Visibility Silt Fence	LF	2,260	15.0%	$5.70	$14,814.30
	CONTINGENCY FOR UNIDENTIFIED ITEMS (30%)					$20,695.66
	SECTION SUBTOTAL					$89,681.18
	SECTION 18: TRAFFIC					
	Traffic Control (1.5% of sections 1 - 17)	LS	1	5.0%	$222,118.13	$233,224.03
	Illumination System	LS	1	20.0%	$300,000.00	$360,000.00
6700	Cement Conc. Traffic Curb and Gutter	LF	5,870	15.0%	$72.13	$486,936.07
6806	Paint Line (Striping)	LF	13,520	20.0%	$0.40	$6,435.52
6890	Permanent Signing	LS	1	20.0%	$50,000.00	$60,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (15%)					$162,989.34
	SECTION SUBTOTAL					$1,309,584.96
	SECTION 19: OTHER ITEMS					
	Railroad Flagging ($1500/ day)	DAY	7	0.0%	$10,500.00	$73,500.00
	Signalized Intersection	LS	1	10.0%	$500,000.00	$550,000.00
7055	Cement Concrete Sidewalk	SY	2,447	15.0%	$76.23	$214,476.43
7037	Structure Surveying	LS	1	10.0%	$10,000.00	$11,000.00
7038	Roadway Surveying	LS	1	10.0%	$20,000.00	$22,000.00
7480	Roadside Cleanup	DOL	1	0.0%	$5,000.00	$5,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$87,597.64
	SECTION SUBTOTAL					$963,574.07

	Construction Subtotal		$17,393,034
	Mobilization (10%)		$1,739,303
	Sales Tax (0.0%)		$0
	TOTAL COST OF CONSTRUCTION IN CURRENT YEAR		**$19,132,338**
	Other Costs		
	Right of Way Costs Current Year		$1,959,878
	Right of Way Contingency	15.0%	$293,982
	TOTAL OTHER COSTS IN YEAR OF EXPENDITURE		**$2,253,860**
	TOTAL PROJECT COST IN YEAR OF EXPENDITURE		**$21,386,197**

Clark County, Washington
NE 99th Extension Feasibility Study
Opinion of Probable Construction Cost
ALTERNATIVE D (Under Railroad)

ITEM NO.	ITEM	UNIT	QUANTITY	QUANTITY CONTINGENCY %	UNIT PRICE	ITEM COST
	SECTION 1: PREPARATION					
0025	Clearing and Grubbing	AC	2	15.0%	$11,166.67	$29,613.07
0050	Removal of Structure and Obstructions	LS	1	20.0%	$50,000.00	$60,000.00
0100	Removing Cement Conc. Sidewalk	SY	2,600	20.0%	$9.33	$29,120.00
0108	Removing Curb and Gutter	LF	260	20.0%	$9.67	$3,016.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$12,174.91
	SECTION SUBTOTAL					$133,923.98
	SECTION 2: GRADING					
0310	Roadway Excavation Incl. Haul	CY	86,874	20.0%	$7.67	$799,241.31
0421	Gravel Borrow Including Haul	CY	15,521	20.0%	$26.00	$484,261.56
0470	Embankment Compaction	CY	27,592	20.0%	$2.17	$71,740.02
	CONTINGENCY FOR UNIDENTIFIED ITEMS (3%)					$40,657.29
	SECTION SUBTOTAL					$1,395,900.17
	SECTION 3: STOCKPILING					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 4: DRAINAGE					
	Stream Restoration	LS	1	15.0%	$25,000.00	$28,750.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (20%)					$5,750.00
	SECTION SUBTOTAL					$34,500.00
	SECTION 5: STORM SEWER					
3090	Catch Basin Type 1	EACH	17	15.0%	$3,805.00	$73,950.18
3151	Testing Storm Sewer Pipe	LF	3,380	15.0%	$3.17	$12,308.83
3541	Schedule A Storm Sewer Pipe 12 In. Diam.	LF	3,380	15.0%	$25.00	$97,175.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (25%)					$45,858.50
	SECTION SUBTOTAL					$229,292.51
	SECTION 6: SANITARY SEWER					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 7: WATER LINES					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 8: STRUCTURES					
	Curtin Creek Precast Prestressed WF I-Girder Bridge (Multi-Span)	SF	18309	15.0%	$240.00	$5,053,284.00
	Curtin Creek Approach Slabs	SY	356	15.0%	$400.00	$163,760.00
	Curtin Creek MSE Wall Barrier w/ Moment Slab	LF	1850	15.0%	$400.00	$851,000.00
	Railroad Bridge	EA	3	25.0%	$1,121,700.00	$4,206,375.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$1,027,441.90
	SECTION SUBTOTAL					$11,301,860.90
	SECTION 9: SURFACING					
5100	Crushed Surfacing Base Course	CY	3,860	20.0%	$31.33	$145,124.14
6530	Soil Amendment (Compost Amended Topsoil)	CY	207	15.0%	$32.93	$7,854.19
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$15,297.83
	SECTION SUBTOTAL					$168,276.17
	SECTION 10: LIQUID ASPHALT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 11: BITUMINIOUS SURFACE TREATMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 13: CEMENT CONCRETE PAVEMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 14: HOT MIX ASPHALT					
5711	Planing Bituminous Pavement	SY	1,433	15.0%	$10.67	$17,582.22
5767	HMA CL 1/2" PG 64-22	TON	2,123	15.0%	$103.67	$253,143.96
5769	HMA CL 1" PG 64-22	TON	3,185	20.0%	$142.00	$542,739.53
	CONTINGENCY FOR UNIDENTIFIED ITEMS (5%)					$39,794.17
	SECTION SUBTOTAL					$835,677.66
	SECTION 15: SEAL COAT					

	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 16: IRRIGATION AND WATER DISTRIBUTION					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 17: EROSION CONTROL AND ROADSIDE PLANTING					
6403	ESC Lead	Day	21	15.0%	$428.33	$10,344.25
6488	Erosion Control and Water Pollution Prevention	LS	1	10.0%	$20,000.00	$22,000.00
6414	Seeding, Fertilizing, and Mulching	AC	1.0	20.0%	$5,733.33	$6,893.43
6630	High Visibility Fence	LF	4,600	15.0%	$2.48	$13,136.83
6635	High Visibility Silt Fence	LF	2,260	15.0%	$5.70	$14,814.30
	CONTINGENCY FOR UNIDENTIFIED ITEMS (30%)					$20,156.64
	SECTION SUBTOTAL					$87,345.45
	SECTION 18: TRAFFIC					
	Traffic Control (1.5% of sections 1 - 17)	LS	1	5.0%	$43,273.74	$45,437.43
	Illumination System	LS	1	20.0%	$300,000.00	$360,000.00
6700	Cement Conc. Traffic Curb and Gutter	LF	6,170	15.0%	$72.13	$511,822.07
6806	Paint Line (Striping)	LF	14,120	20.0%	$0.40	$6,721.12
6890	Permanent Signing	LS	1	20.0%	$50,000.00	$60,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (15%)					$138,597.09
	SECTION SUBTOTAL					$1,122,577.70
	SECTION 19: OTHER ITEMS					
	Railroad Flagging ($1500/ day)	DAY	7	0.0%	$10,500.00	$73,500.00
	Signalized Intersection	LS	1	10.0%	$500,000.00	$550,000.00
7055	Cement Concrete Sidewalk	SY	2,647	15.0%	$76.23	$232,008.56
7037	Structure Surveying	LS	1	10.0%	$10,000.00	$11,000.00
7038	Roadway Surveying	LS	1	10.0%	$20,000.00	$22,000.00
7480	Roadside Cleanup	DOL	1	0.0%	$5,000.00	$5,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$89,350.86
	SECTION SUBTOTAL					$982,859.42

	Construction Subtotal		$16,292,214
	Mobilization (10%)		$1,629,221
	Sales Tax (0.0%)		$0
	TOTAL COST OF CONSTRUCTION IN CURRENT YEAR		**$17,921,435**
	Other Costs		
	Right of Way Costs Current Year		$1,697,401
	Right of Way Contingency	15.0%	$254,610
	TOTAL OTHER COSTS IN YEAR OF EXPENDITURE		**$1,952,011**
	TOTAL PROJECT COST IN YEAR OF EXPENDITURE		**$19,873,447**

Clark County, Washington
NE 99th Extension Feasibility Study
Opinion of Probable Construction Cost
ALTERNATIVE F

ITEM NO.	ITEM	UNIT	QUANTITY	QUANTITY CONTINGENCY %	UNIT PRICE	ITEM COST
	SECTION 1: PREPARATION					
0025	Clearing and Grubbing	AC	11	15.0%	$4,073.33	$49,787.17
0050	Removal of Structure and Obstructions	LS	1	20.0%	$50,000.00	$60,000.00
0100	Removing Cement Conc. Sidewalk	SY	4,100	20.0%	$9.33	$45,920.00
0108	Removing Curb and Gutter	LF	410	20.0%	$9.67	$4,756.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$16,046.32
	SECTION SUBTOTAL					$176,509.49
	SECTION 2: GRADING					
0310	Roadway Excavation Incl. Haul	CY	24,210	20.0%	$23.00	$668,183.22
0421	Gravel Borrow Including Haul	CY	13,064	20.0%	$21.75	$340,967.02
0470	Embankment Compaction	CY	41,751	20.0%	$2.17	$108,553.18
	CONTINGENCY FOR UNIDENTIFIED ITEMS (3%)					$33,531.10
	SECTION SUBTOTAL					$1,151,234.52
	SECTION 3: STOCKPILING					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 4: DRAINAGE					
	Stream Restoration	LS	1	15.0%	$25,000.00	$28,750.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (20%)					$5,750.00
	SECTION SUBTOTAL					$34,500.00
	SECTION 5: STORM SEWER					
3090	Catch Basin Type 1	EACH	23	15.0%	$3,805.00	$101,189.22
3151	Testing Storm Sewer Pipe	LF	4,625	15.0%	$3.17	$16,842.71
3541	Schedule A Storm Sewer Pipe 12 In. Diam.	LF	4,625	15.0%	$25.00	$132,968.75
	CONTINGENCY FOR UNIDENTIFIED ITEMS (25%)					$62,750.17
	SECTION SUBTOTAL					$313,750.85
	SECTION 6: SANITARY SEWER					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 7: WATER LINES					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 8: STRUCTURES					
	Curtin Creek Precast Prestressed WF I-Girder Bridge (Multi-Span)	SF	18309	15.0%	$240.00	$5,053,284.00
	Curtin Creek Approach Slabs	SY	356	15.0%	$400.00	$163,760.00
	Curtin Creek MSE Wall Barrier w/ Moment Slab	LF	1850	15.0%	$400.00	$851,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$606,804.40
	SECTION SUBTOTAL					$6,674,848.40
	SECTION 9: SURFACING					
5100	Crushed Surfacing Base Course	CY	5,495	20.0%	$29.67	$195,633.87
6530	Soil Amendment (Compost Amended Topsoil)	CY	304	15.0%	$32.93	$11,510.15
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$20,714.40
	SECTION SUBTOTAL					$227,858.42
	SECTION 10: LIQUID ASPHALT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 11: BITUMINIOUS SURFACE TREATMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 13: CEMENT CONCRETE PAVEMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 14: HOT MIX ASPHALT					
5711	Planing Bituminous Pavement	SY	1,050	15.0%	$10.70	$12,920.25
5767	HMA CL 1/2" PG 64-22	TON	3,025	15.0%	$103.67	$360,637.83
5769	HMA CL 1" PG 64-22	TON	4,538	20.0%	$142.00	$773,205.90
	CONTINGENCY FOR UNIDENTIFIED ITEMS (5%)					$56,692.19
	SECTION SUBTOTAL					$1,190,535.93
	SECTION 15: SEAL COAT					

	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 16: IRRIGATION AND WATER DISTRIBUTION					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 17: EROSION CONTROL AND ROADSIDE PLANTING					
6403	ESC Lead	Day	28	15.0%	$428.33	$13,792.33
6488	Erosion Control and Water Pollution Prevention	LS	1	10.0%	$30,000.00	$33,000.00
6414	Seeding, Fertilizing, and Mulching	AC	2.5	20.0%	$4,100.00	$12,452.48
6630	High Visibility Fence	LF	6,370	15.0%	$2.48	$18,191.66
6635	High Visibility Silt Fence	LF	2,670	15.0%	$5.70	$17,501.85
	CONTINGENCY FOR UNIDENTIFIED ITEMS (30%)					$28,481.50
	SECTION SUBTOTAL					$123,419.82
	SECTION 18: TRAFFIC					
	Traffic Control (1.5% of sections 1 - 17)	LS	1	5.0%	$148,389.86	$155,809.35
	Illumination System	LS	1	20.0%	$300,000.00	$360,000.00
6700	Cement Conc. Traffic Curb and Gutter	LF	8,400	15.0%	$19.83	$191,590.00
6709	Roundabout Truck Apron Cem. Conc. and Gutter	LF	330	15.0%	$61.00	$23,149.50
6806	Paint Line (Striping)	LF	18,500	20.0%	$0.28	$6,290.00
6890	Permanent Signing	LS	1	20.0%	$50,000.00	$60,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (15%)					$110,525.83
	SECTION SUBTOTAL					$907,364.68
	SECTION 19: OTHER ITEMS					
	Railroad Flagging ($1500/ day)	DAY	7	0.0%	$10,500.00	$73,500.00
	Signalized Intersection	LS	1	10.0%	$500,000.00	$550,000.00
7055	Cement Concrete Sidewalk	SY	5,600	15.0%	$42.50	$273,700.00
7037	Structure Surveying	LS	1	10.0%	$10,000.00	$11,000.00
7038	Roadway Surveying	LS	1	10.0%	$30,000.00	$33,000.00
7480	Roadside Cleanup	DOL	1	0.0%	$5,000.00	$5,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$94,620.00
	SECTION SUBTOTAL					$1,040,820.00

	Construction Subtotal		$11,840,842
	Mobilization (10%)		$1,184,084
	Sales Tax (0.0%)		$0
	TOTAL COST OF CONSTRUCTION IN CURRENT YEAR		**$13,024,926**
	Other Costs		
	Right of Way Costs Current Year		$2,566,753
	Right of Way Contingency	15.0%	$385,013
	TOTAL OTHER COSTS IN YEAR OF EXPENDITURE		**$2,951,766**
	TOTAL PROJECT COST IN YEAR OF EXPENDITURE		**$15,976,692**

Clark County, Washington
NE 99th Extension Feasibility Study
Opinion of Probable Construction Cost
ALTERNATIVE J

ITEM NO.	ITEM	UNIT	QUANTITY	QUANTITY CONTINGENCY %	UNIT PRICE	ITEM COST
	SECTION 1: PREPARATION					
0025	Clearing and Grubbing	AC	5	15.0%	$8,500.00	$46,404.32
0050	Removal of Structure and Obstructions	LS	1	20.0%	$50,000.00	$60,000.00
0100	Removing Cement Conc. Sidewalk	SY	4,794	20.0%	$3.00	$17,258.40
0108	Removing Curb and Gutter	LF	799	20.0%	$19.67	$18,856.40
0116	Removing Inlet	EA	2	25.0%	$320.00	$800.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$14,331.91
	SECTION SUBTOTAL					$157,651.03
	SECTION 2: GRADING					
0310	Roadway Excavation Incl. Haul	CY	11,909	20.0%	$26.33	$376,338.44
0421	Gravel Borrow Including Haul	CY	15,813	20.0%	$21.75	$412,728.00
0470	Embankment Compaction	CY	15,813	20.0%	$3.67	$69,578.67
	CONTINGENCY FOR UNIDENTIFIED ITEMS (3%)					$25,759.35
	SECTION SUBTOTAL					$884,404.46
	SECTION 3: STOCKPILING					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 4: DRAINAGE					
	Stream Restoration	LS	1	15.0%	$25,000.00	$28,750.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (20%)					$5,750.00
	SECTION SUBTOTAL					$34,500.00
	SECTION 5: STORM SEWER					
3090	Catch Basin Type 1	EACH	19	15.0%	$3,805.00	$83,139.25
3151	Testing Storm Sewer Pipe	LF	3,800	15.0%	$3.17	$13,838.33
3541	Schedule A Storm Sewer Pipe 12 In. Diam.	LF	3,800	15.0%	$25.00	$109,250.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (25%)					$51,556.90
	SECTION SUBTOTAL					$257,784.48
	SECTION 6: SANITARY SEWER					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 7: WATER LINES					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 8: STRUCTURES					
	Curtin Creek Precast Prestressed WF I-Girder Bridge (Single-Span)	SF	10197	30.0%	$220.00	$2,916,342.00
	Curtin Creek Approach Slabs	SY	460	30.0%	$400.00	$239,200.00
	Curtin Creek MSE Wall Barrier w/ Moment Slab	LF	1670	30.0%	$400.00	$868,400.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$402,394.20
	SECTION SUBTOTAL					$4,426,336.20
	SECTION 9: SURFACING					
5100	Crushed Surfacing Base Course	CY	2,931	20.0%	$30.28	$106,511.62
6530	Soil Amendment (Compost Amended Topsoil)	CY	240	15.0%	$285.00	$78,654.54
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$18,516.62
	SECTION SUBTOTAL					$203,682.77
	SECTION 10: LIQUID ASPHALT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 11: BITUMINIOUS SURFACE TREATMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 13: CEMENT CONCRETE PAVEMENT					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 14: HOT MIX ASPHALT					
5711	Planing Bituminous Pavement	SY	6,078	15.0%	$5.25	$36,694.58
5767	HMA CL 1/2" PG 64-22	TON	1,538	15.0%	$99.00	$175,123.23
5769	HMA CL 1" PG 64-22	TON	2,307	20.0%	$116.00	$321,174.61
	CONTINGENCY FOR UNIDENTIFIED ITEMS (5%)					$24,814.89
	SECTION SUBTOTAL					$521,112.73
	SECTION 15: SEAL COAT					

	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 16: IRRIGATION AND WATER DISTRIBUTION					
	No items anticipated.					$0.00
	SECTION SUBTOTAL					$0.00
	SECTION 17: EROSION CONTROL AND ROADSIDE PLANTING					
6403	ESC Lead	Day	21	15.0%	$428.33	$10,344.25
6488	Erosion Control and Water Pollution Prevention	LS	1	10.0%	$20,000.00	$22,000.00
6414	Seeding, Fertilizing, and Mulching	AC	0.5	20.0%	$5,808.67	$3,200.37
6630	High Visibility Fence	LF	5,540	15.0%	$2.48	$15,821.32
6635	High Visibility Silt Fence	LF	2,060	15.0%	$5.70	$13,503.30
	CONTINGENCY FOR UNIDENTIFIED ITEMS (30%)					$19,460.77
	SECTION SUBTOTAL					$84,330.00
	SECTION 18: TRAFFIC					
	Traffic Control (1.5% of sections 1 - 17)	LS	1	5.0%	$32,151.98	$33,759.58
	Illumination System	LS	1	20.0%	$300,000.00	$360,000.00
6700	Cement Conc. Traffic Curb and Gutter	LF	7,600	15.0%	$72.13	$630,445.33
6806	Paint Line (Striping)	LF	15,200	20.0%	$0.40	$7,235.20
6890	Permanent Signing	LS	1	20.0%	$50,000.00	$60,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (15%)					$154,716.02
	SECTION SUBTOTAL					$1,246,156.13
	SECTION 19: OTHER ITEMS					
	Railroad Flagging ($1500/ day)	DAY	7	0.0%	$10,500.00	$73,500.00
	Signalized Intersection	LS	1	10.0%	$750,000.00	$825,000.00
7055	Cement Concrete Sidewalk	SY	5,067	15.0%	$32.00	$186,453.33
7037	Structure Surveying	LS	1	10.0%	$10,000.00	$11,000.00
7038	Roadway Surveying	LS	1	10.0%	$20,000.00	$22,000.00
7480	Roadside Cleanup	DOL	1	0.0%	$5,000.00	$5,000.00
	CONTINGENCY FOR UNIDENTIFIED ITEMS (10%)					$112,295.33
	SECTION SUBTOTAL					$1,235,248.67

	Construction Subtotal		$9,051,206
	Mobilization (10%)		$905,121
	Sales Tax (0.0%)		$0
	TOTAL COST OF CONSTRUCTION IN CURRENT YEAR		**$9,956,327**
	Other Costs		
	Right of Way Costs Current Year		$4,208,627
	Right of Way Contingency	15.0%	$631,294
	TOTAL OTHER COSTS IN YEAR OF EXPENDITURE		**$4,839,921**
	TOTAL PROJECT COST IN YEAR OF EXPENDITURE		**$14,796,248**