East Aberdeen Mobility Project

Preferred Alternative Selection Report

April 2015

Prepared for:

Grays Harbor Council of Governments

GHCOG
COUNCIL OF GOVERNMENTS

Prepared by:

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DAVID EVANS AND ASSOCIATES INC.

Contents

FIGURES

TABLES

ACRONYMS

CDMT	Core Decision Making Team
DAHP	Washington State Department of Archaeology and Historic Preservation
DOE	Washington State Department of Ecology
GHCOG	Grays Harbor Council of Governments
LOS	Level of Service
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
POGH	Port of Grays Harbor
PSAP	Puget Sound & Pacific Railroad, owned by Genesee and Wyoming, Inc.
TCP	Traditional Cultural Properties
US 12	US Highway 12
WSDOT	Washington State Department of Transportation

EXECUTIVE SUMMARY

The following executive summary is an overview of the project work completed during the preliminary phase of the East Aberdeen Mobility Project, including project approach, substantive findings and conclusions. This narrative is intended to quickly give the reader an understanding of the project. Technical readers will find a comprehensive narrative following this summary and detailed technical subject narrative contained in the appendices of this report.

Background

Project Limits:

The East Aberdeen Mobility Project evaluated alternatives for improving safety and congestion relief along US 12 between Morrison Riverfront Park and the Wishkah River Bridge in Aberdeen, Washington. Within the project limits, US 12 is a four-lane facility with a center turn lane, and sandwiched between commercial properties along the north and south sides. The Puget Sound & Pacific (PSAP) Railroad parallels US 12 on the south side within the project limits, and serves the Port of Grays Harbor on the west side of Aberdeen.

Purpose and need:

Improvements to the transportation system in east Aberdeen are necessary to relieve congestion, increase mobility, and improve safety on US 12, and improve non-motorized access and safety along US 12.

US 12 serves as the principal transportation route through Aberdeen from the east. In addition to serving as the primary route to the coastal communities on the Pacific Ocean and Olympic Peninsula, it is the arterial roadway for locals, businesses, and moves freight and goods to and from the Port of Grays Harbor.

A commercial area that includes the Olympic Gateway Plaza shopping mall, Walmart, and smaller satellite business are the main retail hub in Grays Harbor County and is located in east Aberdeen between the PSAP railroad and the confluence of the Wishkah and Chehalis Rivers. This commercial area will be referred to as the "Mall" in this document, for ease of reference. Local residents and visitors to Grays Harbor frequent the Mall, as they patronize retail shops and restaurants. The Mall is accessed by vehicles and trucks from US 12 on the north side of the shopping area by crossing over the PSAP Railroad's tracks at seven at-grade intersections and private driveways. When trains pass through east Aberdeen along the PSAP tracks, access to the Mall is blocked until the train passes, which can result in traffic congestion in east Aberdeen.

Traffic congestion occurs on US 12 as vehicles that are attempting to access the Mall use both the eastbound outside (right) lane and the westbound left turn lane as turning storage until the train has passed and clears at-grade railroad intersections. Emergency vehicle access to the Mall is not available when the trains are present, which can last up to 30 minutes depending on train length.

This project is the continuation of previous planning efforts identified in the *US-101 Regional Circulation Plan*, prepared as a partnership between Grays Harbor Council of Governments (GHCOG) and Washington State Department of Transportation (WSDOT) in 2007.

Project Partners:

GHCOG, in partnership with the City of Aberdeen (City) and Port of Grays Harbor (Port), has initiated work on the East Aberdeen Mobility Project. GHCOG received a federal grant that is administered by WSDOT, and partnered with the Port to establish the federal funding local match. The City of Aberdeen serves as a project partner for evaluating design alternatives for a future facility to be constructed within their city limits. These three partners serve as the Core Decision Making Team (CDMT) for the project alternatives.

The consultant team led by David Evans and Associates, Inc. has been retained by the GHCOG to perform the East Aberdeen Mobility Project.

Project Objectives:

The main goal of the project is to evaluate roadway improvement alternatives for a grade-separated facility with the PSAP Railroad's tracks to eliminate stopped vehicles that are waiting on US 12 for trains to pass, in order to access the adjacent commercial area. The project also includes evaluation of non-motorized facilities such as sidewalks, cross walks and bike lanes.

Project Phasing:

The scope of this initial study includes researching existing site conditions, developing project design alternatives, providing public outreach, preparing conceptual designs for the top three alternatives, developing evaluation criteria for the alternatives, and assisting the CDMT to select a preferred concept.

Subsequent phases of the project will include advancing the preferred concept through preliminary design, performing topographic surveying, geotechnical investigations, environmental planning and permitting, right of way acquisition and negotiations, developing a final design package, and assisting the project owners to secure funding for right of way and construction. Project owners would like to advance the project to complete the design and begin construction as soon as possible, and are pursuing grants from state and federal sources.

Work Completed to Date:

The following work has been completed or is substantively complete to date:

- Public involvement with property owners, businesses, and general public
- Desktop review of archaeological and historical significance
- Desktop review of existing geotechnical conditions
- Desktop review and site visits for critical areas and environmental concerns
- Partial topographic survey and base mapping of project limits
- Conceptual design of three grade-separated design alternatives
- Conceptual level cost estimates of three design alternatives
- Conceptual level evaluation of right of way impacts for three design alternatives
- Evaluation criteria developed
- Preferred design alternative has been selected

Substantive Findings

The following list of findings from the work completed to date that had a significant impact on the development of the alternatives for the project includes:

- Community and stakeholder interest in the project continues to be strong and has influenced the development of the evaluation criteria and conceptual designs
- Economic vitality of area businesses must be considered as a priority in evaluating the impacts of the conceptual designs
- Federal funding on the project will trigger NEPA approval, which requires that environmental values are integrated into the decision making processes for the alternatives analysis
- The PSAP rail line will most likely not be relocated and therefore the design concepts must allow for a grade-separated crossing at the rail, into the Mall
- An overcrossing structure is more desirable than an undercrossing due to high groundwater and the proximity to the rivers that are tidal influenced
- Geometry of the roadway facility and overcrossing must accommodate the turning radii of emergency vehicles, recreational vehicles, and delivery vehicles as large as an AASHTO WB-67 semi-truck.
- Vertical alignment of the overcrossing structure must meet the Genesee and Wyoming, Inc.'s., (PSAP Railroad's owner) vertical clearance requirement
- Poor subsurface conditions and bearing capacity will control the type of overcrossing design options

Project Development

The following planning and design activities have occurred in order to select the preferred alternative:

- Brainstorming session and development of ten grade separated design concepts to provide uninterrupted access into the shopping center.

  Conclusion:

  The ten initial concepts were compared using the project goals and design criteria, and narrowed down to the top three concepts for further evaluation.

- Coordinated with WSDOT for improvements to US 12:

  Conclusion:

  The project team met with various support groups within WSDOT Olympic Region (Developer Services, Traffic, etc.) to introduce the initial brainstorming concepts, discuss project goals and ranking criteria, and determine if any of the design concepts were unfavorable to WSDOT and should be ruled out. Additional meetings were held to discuss the three selected design concepts.

- Public Open House and Business Outreach

  Conclusion:

  The project team met independently with property owners and businesses in East Aberdeen at the start of the project to ascertain public priorities and preferences, and used this information to develop the conceptual designs. Two public open houses were held to

present the top three alternatives, gain feedback on the preferred alternative, and prioritize project evaluation criteria and goals.

Conclusion

Conceptual Design Alternative C, ***Chehalis Street Overcrossing***, scored the highest based on the technical evaluation and was also the highest ranked concept in the public feedback process. This new roadway design concept incorporates a two-lane roadway bridge with bike lanes and a sidewalk over US 12 and the PSAP rail line. The north bridge approach is located near Chehalis Street and the south bridge approach touches down within the Mall. Conceptual level right of way acquisition and construction costs for this alternative are anticipated to range from $16.5 Million to $18.5 Million.

EAST ABERDEEN MOBILITY PROJECT

1. BACKGROUND

1.1. Project Study Area

The East Aberdeen Mobility Project study area is located within the eastern limits of the City of Aberdeen (City), Grays Harbor County, Washington (see Figure 1: Vicinity Map). The study limits stretch approximately 0.5 miles along US 12, and is bounded by Morrison Riverfront Park on the east, the Wishkah River on the west, the Chehalis River and the commercial area that includes the Olympic Gateway Plaza shopping mall and Walmart (this area to be referred to as "Mall") on the south, and the steep hillside of 'Think-of-me-hill' on the north (see Figure 2: Study Limits).

Figure 1: Vicinity Map

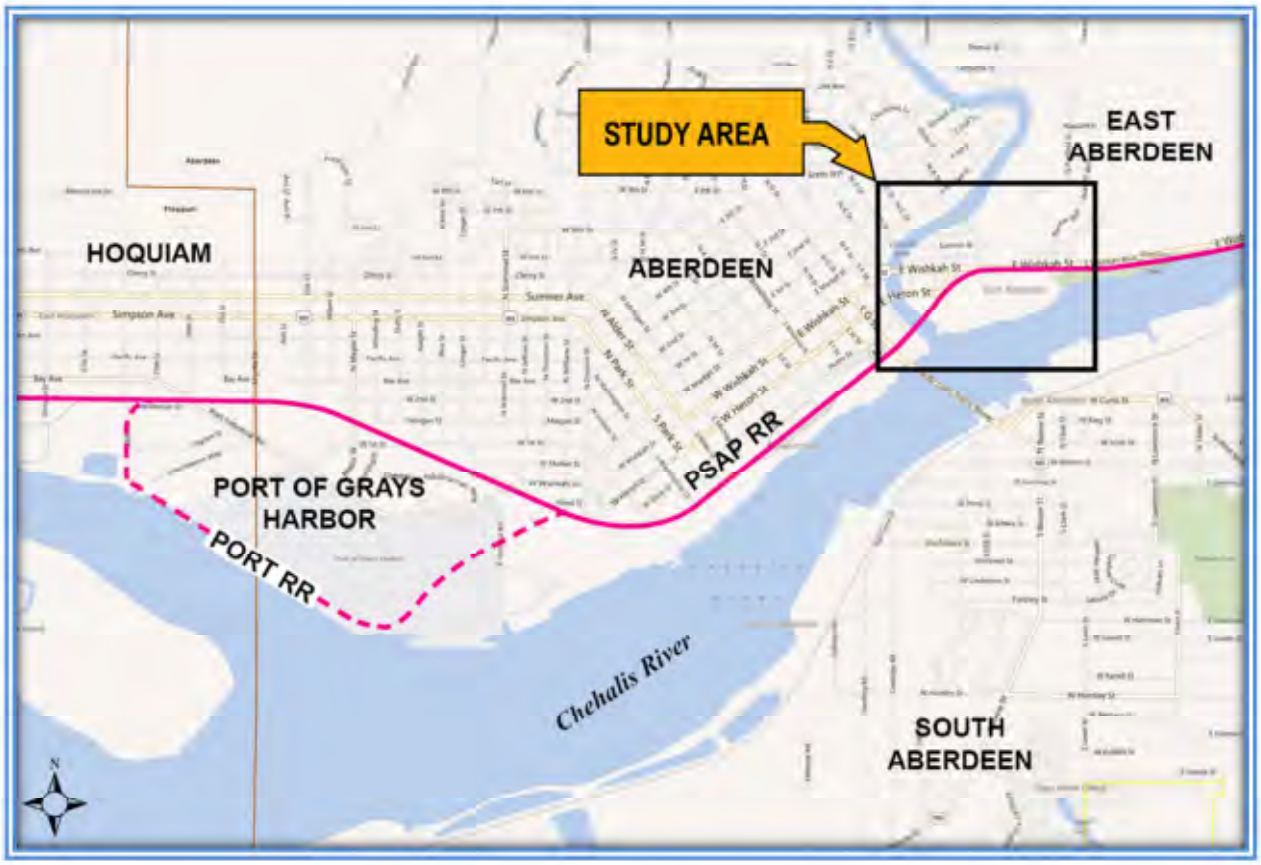


Figure 2: Study Limits

Between S. Newell Street and S. Fleet Street, US 12 (E. Wishkah Street) consists of two way traffic in the east-west direction with four travel lanes and a center turn lane. West of S. Newell Street, US 12 splits into one-way couplets, with the westbound traffic continuing along E. Wishkah Street and the eastbound traffic from downtown Aberdeen on E. Heron Street (see Figure 3: East Aberdeen Traffic Map).

Figure 3: East Aberdeen Traffic Map

Non-motorized facilities within the US 12 corridor include a sidewalk on the north side of US 12 between the Wishkah River and S. Fleet Street, and the south side of E. Heron Street along the Guesthouse Suites Hotel frontage. There are currently no bicycle lanes on US 12 within the study limits.

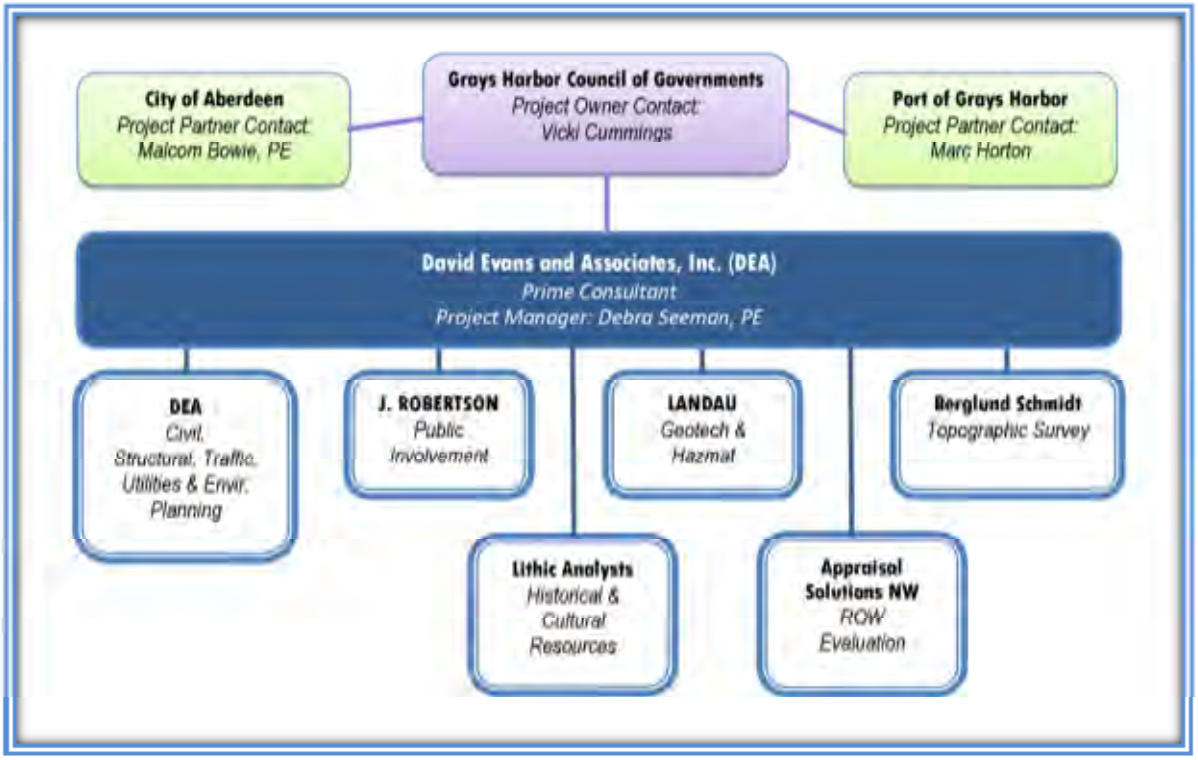
The PSAP rail line, owned by Genesee and Wyoming, Inc., is located adjacent to the southern edge of US 12 between the eastern edge of the study limits and Chehalis Street, at which point the rail line curves to the southwest towards a timber trestle and then crosses over a swing bridge at the Wishkah River (see Figure 3). The PSAP rail line carries rail traffic in both directions and crosses seven at-grade driveways/intersections between US 12 and the Mall. Train speed in this vicinity is currently limited to 10 miles per hour (mph).

1.2. Project Partners

The Grays Harbor Council of Governments (GHCOG), in partnership with the City of Aberdeen (City) and Port of Grays Harbor (POGH), has initiated work on the East Aberdeen Mobility Project. The GHCOG received a federal grant that is administered by Washington State Department of Transportation (WSDOT), and partnered with POGH to establish the federal funding local match for the study. The City served as a project partner for evaluating design alternatives for a future facility to be constructed within their city limits. These three partners served as the Core Decision Making Team (CDMT) for the project alternatives.

A consultant team led by David Evans and Associates, Inc. (DEA) has been retained by the GHCOG to perform the East Aberdeen Mobility Project. The team and their roles are described in Figure 4: Organizational Chart.

Figure 4: Organizational Chart



1.3. Project Description

The need for easing congestion on US 12 in East Aberdeen was identified in an earlier study, the *US-101 Regional Circulation Plan*, prepared by the GHCOG and WSDOT in 2007. The East Aberdeen Mobility Project is in response to that earlier planning effort, and the congestion has continued to grow over the last eight years.

The majority of the traffic congestion is the result of vehicles destined for the commercial area that includes the Olympic Gateway Plaza shopping area, Walmart, and smaller satellite business (this area to be referred to as the "Mall"), which is the main retail hub in the community and Grays Harbor County. Local residents as well as visitors to Grays Harbor frequent the Mall, as they patronized retail shops and restaurants. The Mall is accessed by vehicles from US 12 on the north side of the shopping area by crossing over the PSAP Railroad tracks at seven, at-grade intersections/driveways. When trains are moving through east Aberdeen along the PSAP tracks to and from the Port of Grays Harbor, vehicular access to the commercial area is completely blocked. These blockages may last up to 30 minutes, multiple times a day. During this time, vehicles queue in the US 12 eastbound, right (outside) lane and the westbound, left turn lane until the train clears the Mall access drives. As the waiting-vehicle queue lengths build up, it blocks US 12 traffic in both directions. For eastbound direction, traffic also backs up across the Heron Street Bridge into downtown Aberdeen.

Non-motorized facilities in East Aberdeen are limited to an existing sidewalk on the north side of US 12. Pedestrians are currently able to cross US 12 at the signalized intersections of Chehalis Street and Tyler Street, and an unsignalized crossing of eastbound US 12 at Harbor Street. There are currently no designated bike lanes within the US 12 corridor in East Aberdeen.

This project evaluated roadway improvement alternatives for a grade-separated facility over the PSAP railroad tracks to allow for uninterrupted access into the Mall, which will eliminate parked vehicles on US 12 that are waiting for trains to pass. The project also included evaluating non-motorized facilities such as sidewalks, cross walks and bike lanes.

As discussed below, the project evaluated several grade-separation design concepts, ranked them by project criteria and goals, and selected the preferred concept that will move forward into the next phase of the project for preliminary design.

The scope of this project included researching existing site conditions, developing project design alternatives, providing public outreach, preparing conceptual designs for the top three alternatives, developing evaluation criteria for the alternatives, and assisting the CDMT to select a preferred concept.

Relocation of the PSAP railroad tracks was not included in the scope of this project. It is a logical question to ask if the railroad tracks can be relocated away from US 12 proximity, and thereby reduce or eliminate the congestion on US 12 resulting from cars waiting for the railroad tracks to clear. Unfortunately, there are several reasons why relocating the railroad tracks is not an option for this project. First and foremost, the railroad tracks are not under the jurisdiction of the project partners nor the state of Washington, rather it is privately owned by Genesee and Wyoming, Inc, and the project partners have no authority to force this relocation. Project coordination discussions

were held with PSAP about this very topic. It was also identified that there is not an easy and/or desirable location to shift these tracks, due to the proximity of the Chehalis River, US 12, and the steep hillside of 'Think-of-me-hill'. For these reasons, the East Aberdeen Mobility Project has assumed that any viable solution to ease US 12 congestion will need to involve a grade-separation facility that will allow vehicles, pedestrians, and bicycles to safely cross over or under the PSAP railroad tracks.

Subsequent phases of the project will include advancing the preferred concept through preliminary design, performing topographic surveying, geotechnical investigations, environmental planning, permitting, right of way acquisition and negotiations, developing a final design, and assisting the project owners to secure funding for right of way and construction.

2. Concept Development

2.1. Data Gathering

Project goals and design concept evaluation criteria were developed at the initial project kickoff meeting attended by staff from the consultant team, GHCOG, City, and POGH.

Following the project kickoff meeting and prior to developing design concepts, the team performed a fact finding mission. This included performing desktop reviews of existing site conditions, investigating historical and cultural resources, obtaining topographic survey, researching existing overhead and underground utilities, performing preliminary environmental reviews, and researching right of way impact costs.

Coordination with a large number of project stakeholders was initiated at the beginning of the project to identify project constraints, discuss the project goals, and gain feedback to help develop the design concepts. Members of the consultant team and GHCOG visited with property owners and businesses, emergency service providers, Grays Harbor Transit, PSAP Railroad, WSDOT Olympic Region Developer Services, and Aberdeen Revitalization Movement (ARM). A more detailed summary of this coordination can be found in the Public Involvement section of this report.

2.2. Concept Development Process Overview

The consultant team held a brainstorming work session on July 16, 2014, to identify possible design concepts that would provide grade-separation with the PSAP tracks into the Mall. Approximately ten conceptual designs were developed by the consultant team (see **Appendix A** for sketches) and presented to the CDMT for review. The CDMT and consultant team developed a set of evaluation criteria to for use in narrowing down the concepts to a top three list (see Table 1: Evaluation Criteria).

Table 1: Evaluation Criteria

Cost	**Construction**
	Right of Way Acquisition
Property Impacts	Relocations
	Parking Impacts
Design Elements	Bridge Complexity
	Roadway Approach Steepness
	Pedestrian/Bicycle Facilities
Drive-ability	Intuitiveness for Visitors
	Ease of Use for Locals
Traffic	Level of Service
	Queue Lengths
	Impacts to Downtown
Environmental	Critical Areas
	Hazardous Materials/Contaminated Soils
	Cultural/historical Resources
Constructability	Impacts to Public
	Reliance on PSAP Railroad Coordination
	Construction Duration

A crucial step in this concept development process is to get early buy-in from WSDOT Olympic Region Developer Services. The initial ten design concepts were presented to WSDOT in August, 2014. During this meeting WSDOT identified the top five design concepts that they would like to see move forward in the evaluation process.

After WSDOT provided feedback regarding their top ranking alternatives, the CDMT refined this list to the top three design alternatives. Table 2: Design Concept Descriptions is a listing of the initial ten design concepts with an indication of the top selections made by the consultant team, the CDMT and WSDOT. As shown in the right hand columns in Table 2, after the top three design concepts were selected they were renamed to **Alternatives A, B and C**.

Table 2: Design Concept Descriptions

Initial Design Concepts					Top 3 Concepts	
Alt. #	**Name:**	**DEA Top Choice**	**CDMT Top Choice**	**WSDOT Top Choice**	**Top 3 Alt. Designation**	**Top 3 Alt. Name**
1	Tyler St. Jughandle	X		X		
2	Chehalis St. Jughandle with Roundabout at Newell St.	X	X	X	C	Chehalis Street Overcrossing
3	Modified Texas-T			X	B	Benn Street Modified Texas-T
4	Jughandle at Chehalis St. & Benn St.	X	X	X	*This alternate was combined with Alt. 2 to create "Alt C"	
5	Overcrossing at Harbor Street into Walmart					
6	Jughandle at Chehalis St. to the east		X			
7	Newell Knot	X				
8	Raised T-intersection at Gas Station					
9	Jughandle at Log Pavilion					
10	Heron Street Overcrossing	X	X	X	A	Heron Street Flyover
11	Elevated Roundabout (Added by WSDOT)			X		

2.3. Top Three Design Concepts Descriptions

2.3.1. Alternative A – Heron Street Flyover

Design alternative A, Heron Street Flyover, constructs a two-lane bridge approach at the west end of the study limits, parallel to and on the northern edge of Heron Street. A bridge overpass extends over the two existing eastbound travel lanes of Heron Street/US 12 and the PSAP rail line, and ramps down into the Mall parking lot. A rendering of this alternative is shown in Figure 5.

Figure 5: Alternative A (Heron Street Flyover) Rendering

Traffic circulation for Alternative A is shown in Figure 6. Vehicles destined for the Mall via the overpass must originate from downtown Aberdeen travel eastbound on Heron Street over the Wishkah River, and enter the overpass from the left hand lane of Heron Street/US 12.

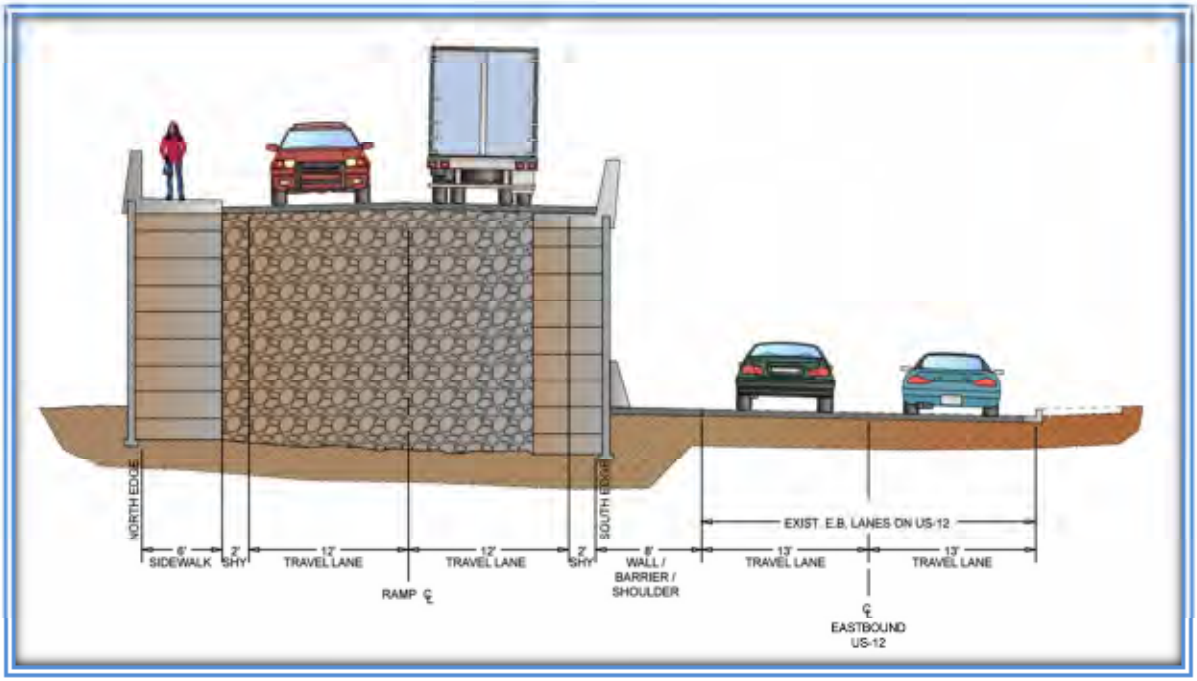
Vehicles leaving the shopping area parking lot access the overpass from the north edge of the Walmart parking lot, travel over the PSAP Railroad and the two eastbound lanes of US 12, and touch back down to existing grade at Kansas Street. All vehicles must turn right onto Kansas Street, travel north one block, and then turn left at East Wishkah Street/US 12 and travel over the Wishkah River back towards downtown Aberdeen.

A roundabout at the intersection of US 12 and Chehalis Street has been provided to allow for U-turn movement for vehicles leaving downtown Aberdeen that missed the overpass entrance, and need to circulate back through downtown to access the overpass when a train is blocking all of the at-grade shopping center entrances.

Figure 6: Alternative A Traffic Circulation

As shown in the cross section sketch of the elevated structure and approach ramps in Figure 7, one 12-foot travel lane with 2-foot shoulder is provided in each direction. Due to limited right of way along the existing US 12 and the adjacent car dealership, sidewalk has been provided on only one side and bike lanes have not been included.

Figure 7: Alternative A Cross Section (Looking East)



2.3.2. Alternative B – Benn Street Modified Texas-T

Design alternative B constructs a one-way, single-lane ramp traveling in the westbound direction, down the center of US 12 between Fleet Street and Chehalis Street. At the top of the westbound approach ramp, near the existing Benn Street, a two-lane, two-way bridge extends to the south over the two US 12 eastbound lanes and PSAP rail corridor, and touches down into the Mall (see Figure 8).

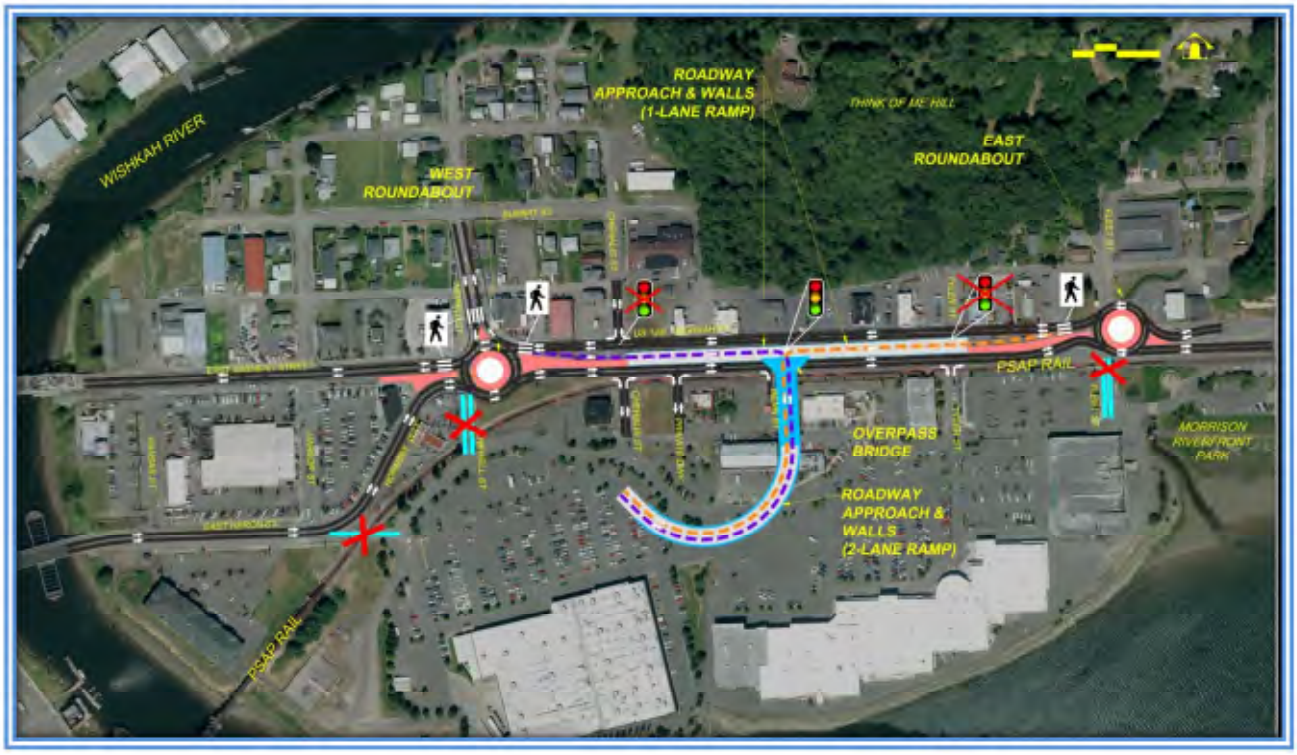
Figure 8: Alternative B (Benn St. Modified Texas-T) Rendering

Traffic circulation for Alternative B is shown in Figure 9. Vehicles destined for the Mall via the overpass must originate from the east side of East Aberdeen, or use the eastern roundabout at Fleet Street, and travel westbound up the single lane ramp towards the overpass into the shopping center.

Vehicles leaving the shopping center parking lot must access the overpass from the central portion of the parking lot, travel over the PSAP Railroad and the two eastbound lanes of US 12, and then turn left at the T-intersection at the top of the structure. After traveling down the ramp and entering the west roundabout, vehicles can either continue west on US 12 towards downtown Aberdeen or make a U-turn in the roundabout to travel east out of town.

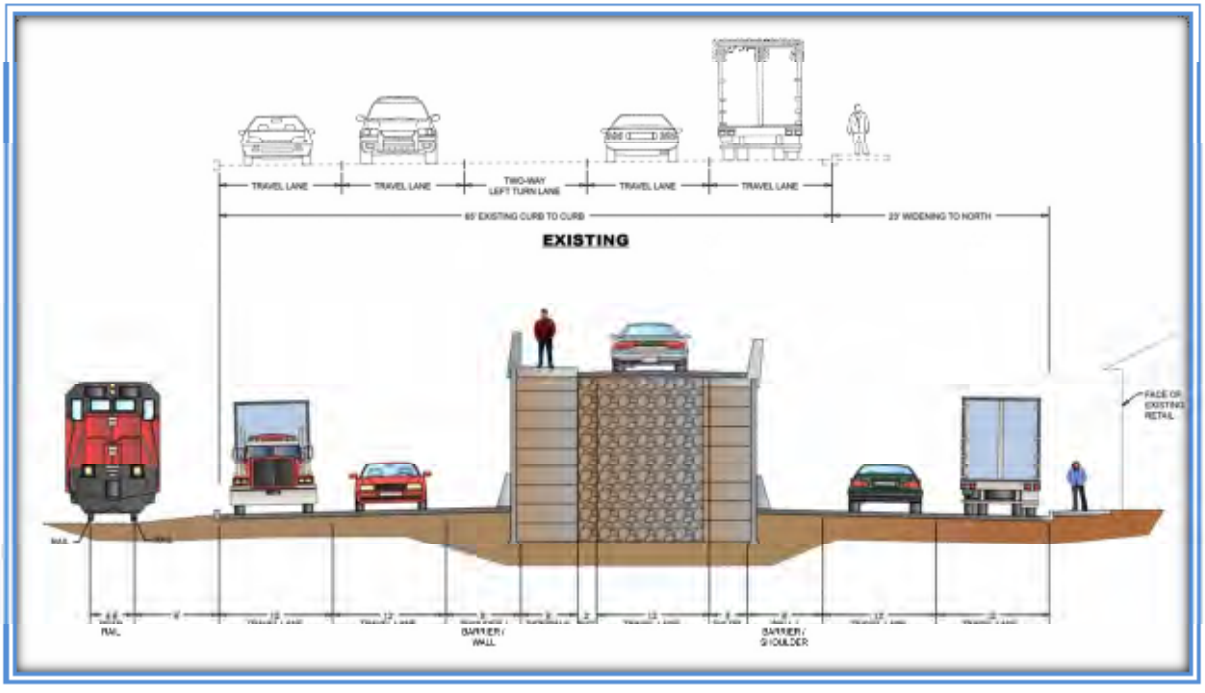
Driveways and entrances on the north and south side of US 12 will become Right-in/Right-out due to the elevated structure in the center of US 12.

Figure 9: Alternative B Traffic Circulation



As shown in the cross section sketch of the elevated structure and approach ramps in Figure 10, one 12-foot travel lane with 2-foot shoulder is provided in the westbound direction. Due to limited right of way along the existing US 12, the PSAP Railroad, and businesses along the north side of US 12, sidewalk has been provided on only one side and bike lanes have not been included.

Figure 10: Alternative B Cross Section (Looking West)



2.3.3. Alternative C – Chehalis Street Overcrossing

Design alternative C constructs a two-lane bridge that crosses over the entire width of US 12 and the PSAP rail corridor. The northern bridge approach wraps around in an arc from the west roundabout (constructed at US 12 and Newell Street) and the southern bridge approach ramp touches down into the center of the Mall parking lot (see Figure 11).

Figure 11: Alternative C (Chehalis St. Overcrossing) Rendering

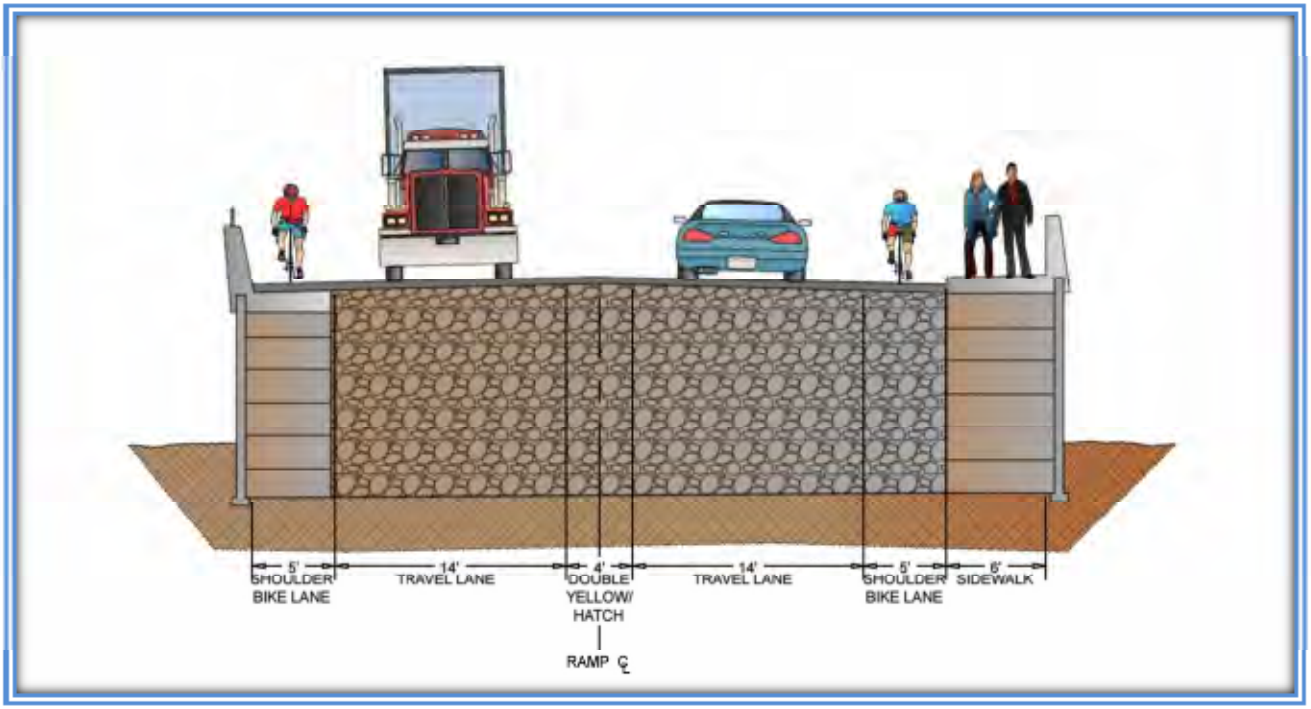
Traffic circulation for Alternative C is shown in Figure 12. Vehicles destined for the Mall via the overpass must originate from the west roundabout, which can be accessed from eastbound or westbound US 12 traffic.

Vehicles leaving the Mall parking lot must access the overpass from the central portion of the Mall parking lot, travel over the PSAP Railroad and US 12, curve west towards Newell Street, and then turn south onto Newell Street towards the west roundabout. Once in the roundabout, traffic can either travel westbound on US 12 towards downtown Aberdeen or continue through the roundabout towards eastbound US 12.

Figure 12: Alternative C Traffic Circulation

As shown in the cross section sketch of the elevated structure and approach ramps in Figure 13, two 14-foot travel lanes, two bike lanes, and one sidewalk is provided.

Figure 13: Alternative C Cross Section (Looking South)



2.4. Geometric Design

The scope of this study includes developing the top three grade-separation alternatives to a conceptual design level. AutoCAD Civil3D, a computer-aided design software, was used to create the horizontal and vertical elements for each alternative. Following is a discussion of the geometric design elements considered while developing the grade-separation alternatives.

2.4.1. Horizontal Design

Factors that control the horizontal footprint include the type of vehicles to be accomodated and their turning movements, horizontal curve radius length, and the roadway cross sectional width.

Design Vehicles

Vehicles with longer wheel bases, such as semi-trucks/trailers, recreational vehicles, fire trucks, buses, and logging trucks, require a large turning radius at roadway curves, right hand turns at intersections, and roundabout circulation lanes. A summary of these design vehicle properties is listed in Appendix B. Vehicle turning templates for these design vehicles were evaluated using AutoTURN software to identify minimum lane widths at horizontal curves, and curb return radii at intersections.

At the roundabout, a truck apron is provided in the center to accommodate the larger vehicles. Truck aprons typically have a smaller vertical height than a standard 6-inch high curb and are textured in a different pattern than the travel lane or sidewalk to designate the area as an alternate driving surface.

Horizontal Curve Radius

Horizontal curve radius design is controlled by the vehicle design speed and superelevation rate (i.e. cross slope of the roadway) of the roadway facility. In an effort to minimize the impacts to surrounding properties, the goal is to reduce the horizontal curve radii as much as possible which can be accomplished by reducing the design speed.

The proposed roadway approaches and bridge overpass for all three of the top alternatives would be designed for a 25 MPH posting. This is compatible with the 30 MPH posted speed limit on US 12 within the study limits and 25 MPH posted speed limit on surrounding City of Aberdeen side streets. The horizontal curve radii will meet the following guidelines from the AASHTO *Policy on Geometric Design of Highways and Streets, 2011 edition*, and vary depending on the ultimate superelevation rate selected during final design (see Appendix B).

Cross Section Design

The total width of the roadway approaches and bridge overpass will depend on the dimensions of the individual components such as retaining walls/traffic barriers, sidewalk(s), bike lane(s), travel lanes, and shoulders. **Table 3** is a summary of the cross section components and approximate dimensions, for the top three alternatives.

Table 3: Design Concept Roadway Cross Section Elements

Alt.	Wall with Barrier	Sidewalk	Bike Lane	Travel Lane	Travel Lane	Bike Lane	Sidewalk	Wall with Barrier
A	YES	6’	-	14’	14’	-	-	YES
B	YES	6’	-	12’	-	4’ Shoulder	-	YES
C	YES	6’	5’	14’	14’	5’	-	YES

Providing multimodal facilities such as bike lanes and sidewalks are project goals, and have been incorporated into the design concepts when possible. As noted in the table above, design Alternatives A and B only have sidewalk on one side of the approach roadway, and do not include a bike lane. In both of these alternatives, providing sidewalk on both sides plus a bike lane would have resulted in extensive right of way impacts that would make these two alternatives not feasible.

2.4.2. Vertical Design

The critical factors controlling the vertical profile of the roadway approach and bridge overpass include vertical clearances over the US 12 travel lanes and PSAP Railroad, as noted below.

Table 4: Minimum Vertical Clearance

FACILITY	MINIMUM VERTICAL CLEARANCE (TO BOTTOM OF BRIDGE OVERPASS)
US 12	16.5’
PSAP RAILROAD	23’

The vertical touch-down point of the roadway approaches were determined by setting the bridge girder elevations to meet the US 12 and PSAP Railroad vertical clearance elevations, then transitioning down to existing ground with a target longitudinal slope of 5%. Vertical curves for the profile were developed according to the AASHTO *Policy on Geometric Design of Highways and Streets, 2011 edition.* Vertical alignment of the overcrossing structure must meet the Genesee and Wyoming, Inc.’s., (PSAP Railroad’s owner) vertical clearance requirement, as identified in Appendix B.

2.5. Utilities

Existing utilities located within US 12, and the surrounding areas within the study limits includes storm drainage, water, sanitary sewer, natural gas, and overhead power/cable/phone. Many of these facilities will require relocation in the areas of the roadway approach fill, and retaining wall foundations. During Preliminary Engineering phase, as utility conflicts are defined in more detail, it may be necessary to pothole select utilities in order to verify locations.

2.6. Geotechnical Investigations

A preliminary geotechnical memorandum prepared by Landau Associates (see Appendix C) supported the conceptual engineering design. This memorandum:

- Presented a summary of desktop review of subsurface conditions within the study limits.

- Identified geologic hazards and assess their impact on the project.
- Addressed geotechnical risks and potential mitigation strategies.
- Provided preliminary recommendations for design and construction of bridge foundations, retaining walls, and bridge approach embankments.

Soil borings and testing will be performed in the Preliminary Engineering Phase to further refine these evaluations. Preliminary geotechnical recommendations include the following:

- Bridge foundations will likely consist of drilled shafts. Embedment depths of 170 feet Below Ground Surface (BGS) were used for conceptual cost considerations.
- The proposed bridge approach embankments will settle excessively and require shallow ground improvement to mitigate bearing capacity failure. Typical options include overbuilding the embankments (which could require up to about 1 year of settling before final grading and paving) or using lightweight fills and wick drains to reduce settlement magnitude.
- Existing underground utilities will need to be rerouted from beneath bridge approach embankments and their immediate vicinity in order to avoid damage imparted by embankment settlement.
- Bridge approach embankments are expected to require repairs after a design earthquake due to liquefaction-induced settlement and potentially lateral spreading. Ground improvement below the embankments will be necessary to keep the approach embankments operational during or shortly after a design earthquake. Options for ground improvement will be studied further in the Preliminary Engineering Phase, and could include stone columns, compaction grout, jet grout, etc.

Although the above considerations are applicable to the top three alternatives, we conclude there are notable differences between each alternative from a geotechnical perspective. In Table 5 below, each alternative is ranked from 1 to 3, with 1 being the most effective or least costly. A total of 6 points was assigned to each geotechnical-related design consideration category.

Table 5: Geotechnical Related Design Considerations

Geotechnical Criteria	Alt. A Heron St. Flyover	Alt. B Benn St. Mod. Texas-T	Alt. C Chehalis St. Overcrossing
Liquefaction and Lateral Spreading Risk	3	2	1
Bridge Foundation Depth	3	1.5	1.5
Embankment Settlement Time	3	1.5	1.5
Embankment Settlement-related Damage to Adjacent Buildings/Streets	2.5	2.5	1
Utility Relocation Requirements	2.5	2.5	1
Ground Improvement Cost Under Embankment	3	2	1
Total Score	**17**	**12**	**7**

Based on the evaluation procedure described above, we concluded that Alternative C is the best suited alternative strictly from a geotechnical standpoint (low score of 7).

Alternatives A and B heavily impact US 12 during construction due to how close the embankments/walls are to the travel lanes of US 12. For both these alternatives, traffic would most likely require rerouting during heavy ground improvement construction. Also, the associated settlement delay and utility/property damage could amount to a fatal flaw for these alternatives.

2.7. Structures

2.7.1. Bridge Structure

In each conceptual design alternative, a new bridge structure will span the PSAP rail line and part, or all of, US 12 travel lanes. Criteria used to evaluate structure types included:

- constructability
- cost-effectiveness
- minimize construction impacts

The design of the new bridge structure follows WSDOT Bridge Design Manual (BDM) and AASHTO LFRD.

Alternates A and C utilized a pre-stressed concrete girder bridge type. This is a cost-effective design option and can be used to accommodate spans of up to approximately 240-feet. The depth of the girders is approximately $1/20^{th}$ of the bridge span length. The strategy for the vertical profile of the design concepts is to minimize the bridge depth, to help aid in reducing the overall height of the roadway and the steepness of the bridge approaches to minimize right of way impacts. These girders are precast offsite and can be installed in place with short closures of the rail and US 12.

Alternate B utilizes a cast-in-place, post-tensioned concrete box girder bridge type with flared sides to accommodate the truck turning radii on top of the structure.

2.7.2. Retaining Walls

Retaining walls were recommended for the bridge approach embankments, which vary in height from 5-feet to 30-feet, to minimize right of way impacts. To reduce overall project cost, the bridge span length has been minimized as must as possible, by substituting with retaining walls. As mentioned in the Geotechnical memorandum, it is recommended to perform ground improvements under the retaining walls and use lightweight fill in the bridge approach embankments/retaining walls.

A cost effective fill wall suitable for this project is the Foam Cement Wall, which is a very lightweight concrete in place of soil as in traditional Mechanically Stabilized Earth Walls (MSE). The advantage of this wall type is the significant reduction in unit weight of the wall mass (30 LB/CF versus 130 LB/CF) and increased strength of the wall mass (concrete cement versus granular soil). The face of the wall is typically finished with a precast wall panel, which can also be an opportunity to incorporate a design or pattern into the wall face.

2.8. Traffic Operations

Traffic volumes and intersection turning movements for the peak AM and PM hours were gathered for the study limits in August 2014, to support the traffic modeling exercise.

All three design alternatives improve the intersection Level of Service (LOS) and queue lengths overall for the study intersections, compared to the existing baseline condition (when a train is present within the study area). All three design alternatives also provide uninterrupted emergency access to the Mall when a train is present.

The Traffic Memorandum (see Appendix D) describes the assumptions, intersection Level of Service (LOS), and vehicle queue results of the existing baseline condition and the three improvement alternatives, for the purpose of ranking the top three design concepts.

A more detailed traffic simulation model will be prepared during the Preliminary Engineering Phase to compare the current day traffic conditions to a future condition, which is usually evaluated for 20 years after the year of construction. This more detailed traffic model will allow the design team to evaluate minor modifications and fine tune the design, to optimize traffic flow through the study area.

2.9. Environmental Considerations

An Environmental Planning Memorandum has been prepared by DEA (see Appendix E), which described the key environmental constraints for the top three alternatives for the project. An Area of Potential Effects (APE) boundary map has been prepared for each alternative, which identified the outer limits of physical impacts associated with the alternatives. The results of the memorandum are based upon a desktop review of data, maps, and documentation from City of Aberdeen, Grays Harbor County, and various state and federal agency sources. A site visit was also conducted on October 27, 2014, to verify the results of the desktop review and note omissions or errors in data.

The following is a brief overview of these findings.

2.9.1. Wetlands and Streams

The Chehalis and Wishkah Rivers are designated as estuarine wetlands. Desktop research did not reveal any wetlands within the APE for the top three alternates. However, a wetland was identified beneath the railroad trestle during the October 2014 site visit, adjacent to Guest House International hotel.

The study limits encompassed a small peninsula defined by the converging channels of the Chehalis River (on the south) and Wishkah River (on the north and west). A stream (Wilson Creek) flows in the north-south direction across the southeastern edge of the peninsula. Work below the ordinary high water mark of these three water bodies would trigger permitting through multiple regulatory agencies.

Table 6: Summary of Wetland & Streams Impacts

Alternate	Wetlands	Streams
A	• Proposed improvements along East Heron Street may be within a wetland buffer, triggering compliance with City critical areas regulations	• Located within the stream and shoreline buffer of the Wishkah River and would trigger compliance with the City's Shoreline Management Master Program Regulations and critical areas regulations.
B	• No impacts to any documented wetlands	• Proposed improvements within the 100-foot stream buffer of Wilson Creek, triggering compliance with City critical areas regulations. • A culvert replacement would trigger substantial permitting requirements, including mitigation. These improvements may also fall within the 200-foot shoreline area of the Chehalis River, triggering compliance with the City's Shoreline Management Master Program Regulations.
C	• No impacts to any documented wetlands	• No impacts to any documented streams

2.9.2. Water Resources

According to City critical areas maps, there are no critical aquifer recharge areas located within the City limits and therefore none within the APE for all alternates. However, the APE for all alternates is located within the 100-year flood zone (FEMA Zone A). Per the City of Aberdeen Comprehensive Plan Policy O-230, new development should be designed to maintain natural flood storage functions and minimize hazards.

Both the Wishkah and Chehalis Rivers are located outside of the APE for all three alternates and will not be directly impacted by the Project.

There are no differences of note amongst the three alternates relative to water resources.

2.9.3. Land Use and Acquisition

Existing land use on the peninsula is primarily commercial, with a pocket of residential land uses located north of Newell Street. Per the City's 2001 Comprehensive Plan, zoning designations within the APE for all three alternates are General Commercial and Multiple Family Residential (north of Newell Street). The area south of US 12 is located within the Waterfront Development (WD) area. Right-of-way acquisitions will be required for all three alternates. Impacts to parcels have been estimated as a 'total-take' or a 'partial-take'. For parcels that are significantly impacted by the project improvements, the entire parcel would be acquired for right of way and the business or resident would be relocated. Residential and commercial relocations that may be required as a result of those acquisitions are identified in **Table 7**. For Alternate B, we have also identified several parcels that will have impacts to the front of their buildings as a result of

the US 12 widening. For these parcels, we have not shown them as total acquisition/relocation, rather, we are estimating a partial right of way acquisition with compensation for damages. This compensation could be used to remodel the buildings to allow the business to continue functioning in their current capacity. These parcels are included in **Table 7** as well.

Table 7: Residential and Commercial Relocations

Alternate	Residential Relocations	Commercial Relocations	Building Impacts Require Significant Remodeling
A	1 parcel	2 parcels (1 business)	0
B	1 parcel	7 parcels (4 businesses)	6 parcels
C	6 parcels	4 parcels (3 businesses)	0

Morrison Riverfront Park is located at the east end of the peninsula. The presence of federal funding on the project requires that this site be protected as a Section 4(f) resource.

The dilapidated condition of many of the structures in the residential area north of Newel Street, observed during the October 2014 site visit, suggests that this is a low-income area. Spanish signage was also observed, suggesting the potential presence of minority populations. If federal funding is obtained for the Project, compliance with Executive Order 128998 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) will be required.

2.9.4. Noise

All three alternates propose changes in the vertical and horizontal alignment of the roadway, which is likely to increase traffic noise in the Project vicinity. Sensitive noise receptors in the Project vicinity include single and multi-family residences north of Newell Street and the Guest House International hotel.

Table 8: Summary of Noise Impacts

Alternate	Noise Impacts
A	• Proposed improvements will elevate westbound US 12 in close proximity to the Guest House International hotel, likely increasing traffic noise for hotel patrons
B	• Proposed improvements will likely increase traffic noise for residents located north of Newel Street
C	• Proposed improvements will likely increase traffic noise for the remaining residents located north of Summit Street and west of Newell Street

2.9.5. Visual Quality

All three alternates propose changes in the vertical and horizontal alignment of the roadway, which will modify visual character within the study limits. The elevated structures proposed under all three alternates are a significant change that will be visible for drivers, residents, employees, and business patrons alike.

Table 9: Summary of Visual Impacts

Alternate	Visual Impacts
A	• Proposed improvements will construct an elevated structure that will modify visual quality for drivers and employees and patrons of businesses on the south side of US 12, and patrons of Guest House International hotel
B	• Proposed improvements will construct an elevated structure that will modify visual quality for drivers and employees and patrons of businesses on both sides of US 12. The structure may impair visibility of businesses on the north side of US 12
C	• Proposed improvements will construct an elevated structure that will modify visual quality for drivers and employees and patrons of businesses on both sides of US 12, and the residential neighborhood on the north side of US 12

2.9.6. Cultural and Archaeological Resources

A Preliminary Cultural Resource Assessment has been prepared by Lithic Analysts for the selected three alternates (see Appendix F). The presence of federal funding on the project will trigger the need to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, and as amended by state law. Revised Code of Washington (RCW) 27.53.060 provides protection of cultural resources on private and public lands in the State of Washington. In addition, 36 CFR Part 800 of the NHPA requires that any Federal agency having direct or indirect jurisdiction over a proposed Federal or Federally assisted undertaking, or issuing licenses or permits, must consider the effect of the proposed undertaking on historic properties eligible for inclusion in the National Register of Historic Places (NRHP). Section 106 of 36 CFR 800 provides the process by which this must be accomplished.

Traditional Cultural Properties (TCPs) are recognized as eligible for inclusion in the NRHP because of "association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (NPS 1996).

Previously recorded archaeological sites are not located within the project study area limits. However, the Washington State Department of Archaeology and Historic Preservation (DAHP) Statewide Predictive Model classifies the project study area limits as "very high risk" for the discovery of unrecorded archaeological sites.

A substantial amount of fill has been introduced in the study area, and any sloughs or creeks have been filled and/or channeled. Archaeological sites, if any, would be located below the fill. For instance, previously recorded archaeological sites in the project study area vicinity are industrial mills or fish weirs, both a direct result of the geomorphology of Grays Harbor and associated rivers and creeks. Some of the previously recorded archaeological sites on Grays Harbor have been identified below many feet of imported and industrial fill. These include both pre-contact and historic sites covered with river fill from natural situations as well as dredging sediments.

Any construction activities that require excavation of below-grade material are at risk of exposing historic artifacts or features.

During the Preliminary Engineering Phase, the team will evaluate the anticipated construction activities associated with the preferred alternative, and determine if a pre-construction archaeological testing plan is necessary to further assess the risk for encountering archaeological material within the APE.

2.9.7. Hazardous Materials

A screening-level environmental assessment report has been prepared by Landau Associates documenting the potential for hazardous materials to be encountered during project construction (see Appendix G). The scope of work included review of Sanborn® map, historical aerial photographs, and a regulatory database report for evidence of sites within and adjacent to the project corridor with known or potential presence of subsurface contamination. Based on this review, a screening-level environmental assessment was conducted of the potential for hazardous materials to be encountered during project construction.

Review of available historical and regulatory information identified 11 sites of potential concern within the study limits. Three of the sites are considered to pose a relatively high risk to the project due to their location relative to one or more of the top three design alternatives and the confirmed presence of contamination in soil and groundwater. The remaining eight sites that were identified are considered to have the potential to affect the project construction based on their historical use(s); however, the relative risk for these sites to impact project construction is considered to be low, due to the lack of specific evidence/information regarding releases to soil or groundwater.

The potential for impact on the project will depend on the depths and locations of the excavations associated with construction. Groundwater contamination may be present at the project corridor due to properties along the corridor or due to potential up gradient sources. Any excavation along the project corridor extending greater than about 5.5 feet BGS, based on an approximate depth to groundwater of between 5.5 and 12 feet BGS, is considered to have the potential to encounter contaminated groundwater.

The three sites considered to pose a relatively high risk to the project are all listed in one or more regulatory databases. Therefore, contacts should be made with Washington State Department of Ecology (DOE) to review the available files for these sites to further evaluate the potential for contamination associated with these sites to affect the project.

The remaining eight sites of potential concern were not identified in the regulatory database report. Therefore, no additional information regarding environmental conditions at these sites is likely available from public sources. During the Preliminary Engineering Phase of the preferred design, further investigation will be required for any of these sites located within the APE.

In addition, due to the history of the project corridor, there is the potential that contamination will be encountered during excavation for project construction at other areas along the corridor. The contractor should be made aware of the potential for encountering contamination and report any staining, odor, or other evidence of potential contamination encountered during any project construction activities. Procedures should be in place for the stockpiling and sampling of excavated soils for characterization purposes, so that any materials that cannot be used as backfill will be disposed in accordance with current regulations.

During the Preliminary Engineering Phase, a formalized plan will be developed for removal, treatment, or disposal of any contaminated soil or groundwater encountered during construction.

2.10. Construction

2.10.1. Construction Staging and Impacts

The top three design alternatives were evaluated for ease of construction and any risks that could develop during construction. Table 10 includes a summary of the constructability criteria and associated benefits and challenges for each of the top three alternatives.

Table 10: Constructability Evaluation of Alternatives

Constructability Criteria	Alt. A Heron St. Flyover	Alt. B Benn St. Mod. Texas-T	Alt. C Chehalis St. Overcrossing
Impacts to US12	**Medium Impact**: Likely to impact one of the two existing eastbound US 12 lanes	**High Impact:** One or two travel lanes and two-way left turn lane of US 12 for full limit of project	**Low Impact**: Minimal impact to US12 while bridge girders are set, which can be done with a few short night-time closures.
Impacts to Rail Service	**Low Impact:** A short duration track closure (2-3 days) is required to install the precast concrete girders over the rail corridor	**Medium Impact**: The cast-in-place box girder will require falsework, which temporarily impedes on the vertical clearance of the rail corridor until the concrete is placed, cured, and falsework removed	**Low Impact:** A short duration track closure (2-3 days) is required to install the precast concrete girders over the rail corridor
Impact of Bridge	**Low**: Foundations can be constructed	**High Impact**: Foundation	**Low**: Foundations can be constructed outside

Foundation Construction	outside the horizontal perimeter of US 12 and PSAP rail corridor	construction will be adjacent to US 12 travel lanes and will require lane closures	the horizontal perimeter of US 12 and PSAP rail corridor
Bridge Approach Embankments	**Medium Impact**: Likely to impact one lane of eastbound US 12 and the adjacent parking lot of Five-Star Dealership	**High Impact:** One travel lane in each direction and two-way left turn lane of US 12 for full limit of project during preloading for approach fills and wall construction	**Low Impact**: No impact to US12; this work will occur on newly-purchased City right of way not on US 12

2.10.2. Construction Timing

Construction duration for a project of this nature typically ranges from 1.5 to 3 years, and is greatly influenced by the amount of work that can be performed unimpeded by adjacent travel lanes.

Alternate B will most likely take the longest to construct. This alternate has the greatest potential to impact the existing travel lanes of US 12, therefore more of the work might be performed at night to reduce impact to the public, which is less efficient for the contractor.

Alternate C will have the least amount of impacts to US 12 traffic since most of the project footprint is located on the northern edges of US 12. This will allow the contractor to perform a large portion of the bridge approach fills 'offline' from US 12, as well as the bridge foundations are located outside the footprint of US 12. Night work will most likely be limited to setting the bridge girders. This relatively unimpeded access to the project site allows the contractor to be more efficient and reduce the construction duration.

Alternate B construction duration will most likely fall within the timelines for Alternate A and C. The bridge approach fill and retaining walls will be constructed directly adjacent to the eastbound travel lanes of US 12. The contractor's staging and work zone on the south side of the approach fills will require a temporary shift of the two eastbound travel lanes of US 12, between the Heron Street bridge and the gas station. This restricted work zone will have some impact on the contractor's efficiency.

2.11. Public Involvement

The East Aberdeen Mobility Project team conducted a variety of outreach activities to ascertain and test public priorities and preferences. These activities included, but were not limited to:

- Property Owner and Neighbor Interviews
- Property Owner and Resident Mailing
- Two Community Open Houses
- Port of Grays Harbor and City of Aberdeen Briefings
- Online Preferences Survey
- Project Fact Sheet
- Web Presence and Updates at ghcog.com

- FAQ Document
- Fielding Public Inquiries

Detailed information about all public involvement activities is provided in Appendix H. The following provides a high-level summary of priorities and preferences.

2.11.1. Priorities and Preferences

At the first open house and through a subsequent web survey, the public identified Option C, the Chehalis St. Overpass, as the preferred alternative and also prioritized overall project objectives. Both were presented at the second open house in December 2014. Votes for the preferred alternative are shown in ***Table 11*** and the ranking of project objectives are shown in Table 12 below.

Table 11: Which mobility improvement option would best improve traffic flow on US12?

Design Option	Open House #1 Votes	Web Survey Votes	Total Votes
Option A: Heron St. Flyover – two lane ramp on Heron St. adjacent to Five Star Dealership with roundabout at US 12/Newell Street	0	22	22
Option B: Benn St. Texas-T – one way ramps in US 12 center lane with overpass at Benn St. and roundabouts at west and east end of ramps	0	9	9
Option C: Chehalis St. Overpass – roundabout at US 12/Newell St. with overpass at Chehalis Street	19	40	59
Total Votes	**19**	**71**	**90**

Table 12: Which project objectives are most important? (Community Votes)

Objective	Open House 1 Votes	Web Survey Votes	Total Votes
1. Ease congestion on US 12 for vehicles and freight	10	60	70
2. Reduce blockages that impede shopping and neighborhood access	4	46	50
3. Improve safety for pedestrians and bicyclists	6	30	36
4. Identify solutions that can be implemented quickly and cost-effectively	7	28	35
5. Identify solutions that minimize impacts to businesses	8	23	31
6. Improve vehicle access via eastbound lanes to neighborhood north of US 12	1	11	12
Total Votes	36	198	234

The Chehalis St. Overpass was also identified as the preferred alternative by key stakeholders, including potentially-impacted property owners. Their input was gathered through one-on-one interviews, telephone exchanges and email, in addition to the workshops.

Concerns to be addressed or resolved in the next study phase include:

- Roundabout information and education – multiple parties expressed concern that a roundabout might exacerbate already congested conditions, or worse, confuse local drivers not accustomed to navigating them.
- Bridge Approach Landings – the landings will impact parking capacity, local traffic flow – for customers and delivery trucks alike, and property owners. Extensive outreach will be necessary to mitigate impacts and identify solutions for affected land owners and/or residents
- Aesthetics – several parties expressed concern about adding "more concrete" to the gateway area. If constructed, the overpass will need to incorporate high quality design features.
- Emergency access – while, long-term, the overpass will provide unfettered access into the Gateway Mall, some are concerned about near-term solutions. Local emergency responders have expressed interest in any coordinating activities that facilitate near-term solutions.
- Safety – while not within the purview of the East Aberdeen Mobility Project, multiple community members expressed concern about the potential transport of oil by rail.

2.11.2. Additional Information

As with any project, community members engage in the project at varying points in time and don't necessarily have the information they need to feel comfortable. Moving forward, it will be important to stress several key points, including:

- this is not a project to facilitate the transport of oil
- federal and state grants will be pursued to finance the project
- simply moving or raising the rail tracks is not a viable or affordable solution

2.12. Construction Costs

A conceptual level cost estimate has been prepared for the top three alternatives, for the purpose of identifying future project funding needs. The construction cost estimate includes construction costs as well as right of way impact costs. The costs were developed from 2014 values plus a 30 percent contingency to allow for cost increases between now and time of construction as well as the refinement of the design from conceptual level to final design.

A detailed summary of the construction costs for each alternative are identified in Appendix I. As shown in *Table 13* below, Alternates A and C are the apparent lowest cost design options. The higher cost of Alternate B is associated with a second roundabout and more significant right of way impacts.

Table 13: Summary of Construction Costs

Alternate	Estimated Construction and Right of Way Costs (in Millions)
A	$17.0 - $19.0
B	$18.5 - $20.5
C	$16.5 - $18.5

3. Conclusion and Recommendations

Conclusion

The purpose of this project was to identify conceptual design solutions to improve the transportation system in east Aberdeen to relieve congestion, increase mobility, and improve safety on US 12, as well as improve non-motorized access and safety along US 12.

The project team proceeded to develop ten design concepts that would accommodate the technical design requirements, the challenging physical project constraints, and public outreach preferences and concerns. The CDMT, WSDOT and consultant team evaluated these concepts based on their ability to meet project goals and criteria, and based on this feedback the CDMT selected their top three design alternatives:

- Alternate A – Heron Street Flyover
- Alternate B – Benn Street Modified Texas-T
- Alternate C – Chehalis Street Overcrossing

Conceptual level design documents have been created for these three alternates including an aerial view traffic circulation map, a future rendering of the elevated structure, and a cross section view of the elevated structure (see Appendix J).

The top three alternatives were then introduced to the public through open houses and individual property owner meetings, and were also presented to key stakeholders such as PSAP Railroad, City staff, Port staff, emergency services, and Grays Harbor Transit.

The CDMT evaluated the top three alternatives based on the technical criteria (see Appendix K) and feedback from the public outreach and key stakeholder coordination process to select a preferred alternative.

Recommendation

Conceptual Design Alternative C, ***Chehalis Street Overcrossing***, scored the highest based on the technical evaluation and the public feedback process. This new roadway design concept incorporates a two-lane roadway bridge with bike lanes and a sidewalk over US 12 and the PSAP Railroad. The north bridge approach is located near Chehalis Street and the south bridge approach touches down within the Mall.

This study will serve as the foundation for moving the preferred alternative forward into the preliminary engineering and environmental planning phase. During this next phase, the preferred alternative will be further refined as additional information is obtained including geotechnical, cultural resources, environmental permitting, and public outreach feedback. While there is a preferred concept for the building a grade-separation structure over US 12 and the PSAP Railroad, there could still be minor modifications to the exact location and layout of that facility, from what is shown in the attached conceptual design exhibits. This will be an iterative process to develop the optimal design solution that is constructible with minimal impacts and that can be built within reasonable federal grant amounts.

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APPENDICES

Appendix A: Initial Design Concepts

Appendix B: Geometric Design

Appendix C: Geotechnical

Appendix D: Traffic

Appendix E: Environmental

Appendix F: Cultural Resources

Appendix G: Hazardous Materials

Appendix H: Public Involvement

Appendix I: Project Costs

Appendix J: Top Three Alternatives Exhibits

Appendix K: Top Three Alternatives Criteria Ranking

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