

# **BNSF RAILWAY INTERMODAL FACILITY ACCESS STUDY**

## **ALTERNATIVE SCREENING ANALYSIS REPORT**

**Prepared for:**

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## EXECUTIVE SUMMARY

This Alternative Screening Analysis Report for the City of Tukwila was prepared by David Evans and Associates, Inc. to evaluate alternative access to the BNSF Railway Intermodal Facility in Tukwila (12400 51<sup>st</sup> Place South, Tukwila WA 98178)

The existing access to the intermodal facility uses 42nd Avenue S and S 124th Street. S 124th Street is also a residential collector street serving the community of Allentown. Several residential homes with driveways are located on S 124th Street, as is the Tukwila Community Center which houses an aquatic center, meeting rooms, classes and activities for all ages, and playground and ball fields.

This study did not create new alternatives but used alternatives that were developed by previous studies. A total of five alternatives were studied: Airport Way S, S 112th Street, S 124th Street, Gateway Drive – North Leg, and 48th Avenue S.

Several desktop researches were performed as part of this study. These researches included critical and sensitive areas, fish and wildlife, water resources, hazardous materials, geological and soils, and cultural and historical resources.

A scored screening matrix was developed collaboratively between the City of Tukwila, BNSF Railway, and David Evans and Associates, Inc. The matrix was presented to Tukwila City Council as well as to the public for their feedback on the screening matrix criteria. The public was allowed to provide feedback via an on-line open house and an in-person open house.

Representatives from Tukwila, BNSF Railway, and David Evans and Associates, Inc. met to score each alternative using a numerical scoring system from 1 to 9. The score for each criteria was added, and the lowest score is the preferred alternative.

Based on the scoring result, the 48th Avenue S alternative is the preferred alternative.

## INTRODUCTION

BNSF Railway owns an intermodal facility that transfers containers from trucks to railroad and vice versa. This facility is located within the City of Tukwila city limits in the Allentown community. The intermodal facility is adjacent to Interstate 5 (I-5) and just south of King County International Airport, also known as Boeing Field. BNSF calls this facility the South Seattle Intermodal Facility.

The only access route to the intermodal facility is along the southern edge of the Allentown community on S 124th Street. In order to improve livability and safety without compromising the operations of the yard, the community and the City are seeking an alternative access route to the intermodal facility.

## PROJECT BACKGROUND

The project area is located in the incorporated community of Allentown, within the City of Tukwila. For several years, the City has worked with Allentown residents on issues related to community impacts resulting from the BNSF South Seattle Intermodal Facility, and on identifying alternatives for a rerouted truck access—one with fewer adverse impacts on the neighborhood. Trucks currently use 42nd Avenue S and S 124th Street to access the rail facility. Over 20 different alternatives for truck access to the rail facility have been studied since 1998.

Truck traffic has increased along the existing truck route over the last several years, due to increased rail activity. The approximately 50 homes along S 124th Street experience 24-hour per day truck traffic, adding to the other existing airport, highway, and train noise levels in the neighborhood. Truck traffic also creates safety issues for residents. Trucks back up at the checkpoint station at the east end of S 124th Street, idling on S 124th Street, waiting to check into the rail facility, creating access difficulties, vehicle exhaust, noise, and safety issues for residents.

## SUMMARY OF DESIGN CRITERIA

After discussions with the City, the typical roadway section for this project used a 12-foot lane, 5-foot bike lane, 5-foot landscape strip, and 5-foot sidewalk. The total width for this roadway section is 75 feet (includes 1-foot for curbs on both side of the street). This same width was also used for the bridge section.

In developing the concept roadway profiles, a design speed of 35 mph was used.

Since the new access would primarily be used by trucks, the maximum roadway grade used was five percent.

## ALTERNATIVES

The City of Tukwila began studying access alternatives to the BNSF Intermodal Facility in 1998. An alternative study was performed by Harding Lawson Associates. Another access alternative study was performed by Cooper Consulting Engineering in 2000. This access study did not develop new alternatives, but used leading alternatives from these previous studies.



**Figure 1 – Project Study Area**



## Airport Way S Alternative

This alternative access would connect the northern end of the intermodal facility to Airport Way S. The existing railroad maintenance road would be reconstructed and provide ingress and egress to the intermodal facility. A new intersection and traffic signal would be required at Airport Way and the access road. Plan sheets for this alternative can be found in **Appendix A**.

Due to geometric constraints and the alignments of Airport Way S and the new access road, access from Airport Way south of the new intersection to the intermodal facility is not feasible. Entry and exit from the intermodal facility would only be north of the new intersection. Taking into account these restrictions, I-5 freeway access would be via S Norfolk Street, East Marginal Way S, and S Boeing Access Road. A figure of the truck freeway access route can be found in **Appendix B**.

This alternative access would require the existing bridge on S Boeing Access Road over the railroad tracks to be reconstructed due to the width of the new access road and the existing bridge configuration.

This alternative would require the intermodal facility to construct the following at the north end of the yard: a check-in/check-out facility, truck queuing lanes, an operations building, and a truck storage access road along the western edge of the facility. This new road cannot be built within the existing BNSF parcel, so new right-of-way would be required.

## S 112th Street Alternative

This alternative would connect to the northern half of the intermodal facility. This new roadway would begin at East Marginal Way S and use the existing Seattle Public Utilities and Seattle City Light utilities corridor. The utilities corridor borders a shooting range to the north, and Duwamish Hill Preserve and a residential neighborhood to the south. A bluff separates the higher-elevation residential neighborhood from S 112th Street to the north and the rail facility to the east.

The existing utility corridor contains three separate high-power transmissions lines and a large-diameter water line, as seen in aerial photos.

Plan sheets for this alternative can be found in **Appendix A**.

The truck freeway access route to I-5 would be via East Marginal Way S and S Boeing Access Road. A figure of the truck freeway access route can be found in **Appendix B**.

This alternative would require the intermodal facility to construct the following at the north end of the yard: a check-in/check-out facility, truck queuing lanes, an operations building, and a truck storage access road along the western edge of the facility. This new road cannot be built within the existing BNSF parcel, so new right-of-way would be required.

## S 124th Street Alternative

This alternative would use the existing route and connect into the intermodal facility at its current location. Truck traffic would continue to access the rail facility using Interurban Avenue S, 42nd

Avenue S, S 124th Street, and the existing check-in/check-out facility. No improvements or changes would occur to the streets along the route as part of this project. This route is adjacent to approximately 50 homes and the Tukwila Community Center, and runs through the middle of the Allentown neighborhood. Impacts to the neighborhood associated with the truck traffic would continue, similar to existing conditions, and could continue to worsen, based on recent increases in freight-related truck traffic in this area. Due to its age and service life, the 42nd Avenue S bridge over the Duwamish River would require replacement. Plan sheets for this alternative can be found in **Appendix A**.

As a mitigation measure for the truck noise, it is assumed that a noise wall would be constructed along the northern edge of 42nd Avenue S. The construction of this new noise wall would require the acquisition of all homes whose driveways are on 42nd Avenue S. Also, seven roadways (43rd Avenue S, 44th Avenue S, 45th Avenue S, 46th Avenue S, 47th Avenue S, 48th Avenue S, and 49th Avenue S) would have their access to 42nd Avenue S closed. These streets would become dead-end streets, and new cul-de-sacs would be constructed at the south end of each street. All of the neighbor access would be shifted to S 122nd Street to the north.

There would be no changes to freeway access with this alternative. A figure of the truck freeway access route can be found in **Appendix B**.

There would be no changes to the intermodal facility as part of this alternative.

### **Gateway Drive Alternative**

This alternative access would connect to the intermodal facility at its current check-in/check-out location. This alternative would begin at Interurban Avenue S, use the north leg of Gateway Drive, construct a new roadway between the Boeing Employee Credit Union (BECU) buildings, construct a bridge over the Green River Trail and Duwamish River, go through residential parcels, and tie into the existing intermodal check-in/check-out facility. This alternative would construct three new at-grade intersections at Gateway Drive (east leg), 50th Place S, and 51st Place S. The new bridge would include a 10-foot-wide pedestrian facility. Plan sheets for this alternative can be found in **Appendix A**.

The truck freeway access route to I-5 would be via Interurban Avenue S. A figure of the truck freeway access route can be found in **Appendix B**.

There would be no changes to the intermodal facility as part of this alternative.

### **48th Avenue S Alternative**

This alternative access would connect to the southern end of the intermodal facility. This alternative would begin at Interurban Avenue S, use the existing 48th Avenue S roadway, and construct a new bridge over the Green River Trail and Duwamish River, as well as a roadway that goes under the existing S 129th Street bridge and into the rail yard facility. The new bridge would include a 10-foot-wide pedestrian facility. Plan sheets for this alternative can be found in **Appendix A**.

The truck freeway access route to I-5 would be via Interurban Avenue S. A figure of the truck freeway access route can be found in **Appendix B**.

This alternative would require the intermodal facility to construct new truck queuing and exiting lanes. All new lanes can be constructed within BNSF parcels. No construction or modification would be needed at the existing check-in/check-out facility or operation building.

## SUMMARY OF BACKGROUND DATA COLLECTION

To assist in screening the alternatives, existing information in the following subjects was gathered and displayed as geographic information system (GIS) maps. No field work was conducted, and the information for the existing conditions came from publicly-available sources. An Existing Conditions Technical Memorandum was prepared for each subject area. This information will also be used in the technical discipline reports prepared as part of the environmental documentation under SEPA.

- Critical and Sensitive Areas
- Fish and Wildlife
- Water Resources
- Hazardous Materials
- Geological and Soils
- Cultural and Historical Resources

The following sections provide a summary of the findings.

### Critical and Sensitive Areas

The project area is located in the Puget Sound lowlands, within the tidally-influenced Duwamish estuary ecosystem. Category III and IV wetlands exist within the project study area. The Duwamish River runs through the middle of the project area and is designated by the City of Tukwila as a shoreline of statewide significance.

### Fish and Wildlife

Fish and wildlife use of the project study area is limited by its high density of industrial, commercial, and residential development. Terrestrial wildlife habitat in the project area is limited to the buffers of wetlands, the narrow riparian fringe along the Duwamish River, and a few scattered undeveloped steep slopes and undeveloped parcels.

Fish use in the Duwamish River, which contains a wide range of native and nonnative fish species, includes several species listed as threatened species under the federal Endangered Species Act (ESA), including Chinook salmon, steelhead trout, and bull trout.

### Water Resources

According to the King County Aquifer Recharge Area map, no critical aquifer recharge areas are located within the project area. Since the Duwamish River is a designated floodway that is



contained by constructed levees, there are no 100-year or 500-year floodplains located within the project study area.

All alternatives fall within Tukwila's shoreline jurisdiction.

The Duwamish River is on the Ecology 303(d) list for over 300 water quality pollutants.

### **Hazardous Materials**

Hazardous material sites were identified within the project study area. Each site was assigned a risk rating (low, medium, or high). The risk assigned was based on professional judgment considering each site's distance to the alternative footprint, type, duration of historical development, contaminated media, known gradient and contaminant migration potential. The majority of the sites were classified as low risk. Concerns exist based on historical or current development, but the likelihood for conditions at the site to affect the project is assessed as relatively low.

### **Geological and Soils**

The project study area is located within the Duwamish River valley. Prior to human modifications, the Duwamish River was a natural distributary channel of the Cedar and Green Rivers, as well as the White River. These rivers originate on the flanks of Mount Rainer.

Predominate geologic units mapped in the area of the proposed route alternatives include: alluvium, bedrock, and glacial deposits. The alternative routes are primarily located within the areas mapped as alluvial deposits. Bedrock is mapped along the southeastern edge of the Duwamish River valley in the project study area. Exposed bedrock outcrops are also mapped in the northern portion of the project area while a glacial deposit area was mapped along the southwestern edge of the project study area.

In general, there are relative good soils within the project area; however, the potential of liquefaction does exist within the project study area, especially along the riverbanks.

### **Cultural and Historical Resources**

The project study area is within an area identified by local Native American groups as a traditionally important landscape. Traditional cultural properties are known to be in the vicinity of each access alternative.

Remnants of electric railroad may be located at the western ends of all of the alternatives, and would be considered as items of archaeological importance if encountered.

The project study area contains several buildings, structures, and objects (BSO) that are 35 years or older. The majority of these BSOs are residential homes. Survey and elevations need to be performed to determine if they are eligible for registry.

## SCREENING MATRIX

In the following two sections, an explanation of the selection criteria matrix is presented. The first section, Matrix Criteria, discusses the criteria groups and each individual criterion. The second section, Scoring Methodology, discusses the approach used to score each alternative.

### Matrix Criteria

A screening matrix was developed to score the alternatives. The City of Tukwila, BNSF Railway, and David Evans and Associates, Inc. worked collaboratively to create the screening matrix. The matrix was then presented to the City Council and the public for their comments. Bob Giberson, Tukwila Public Works Director, presented the screening matrix to the City Council. The City Council did not have any comments on the screening matrix.

The screening matrix was presented to the public via two venues: an on-line open house and an in-person open house. The public did not have any comments on the screening matrix.

The screening matrix contained four groups of scoring criteria. The groups and group descriptions are as follow:

- Right-of-Way  
This group evaluates the need for new right-of-way to construct the alternative and railroad yard modifications and the complexity or difficulties in obtaining the new right-of-way.
- Construction  
This group evaluates the complexity, difficulties, and impacts of constructing the alternatives.
- Railroad  
This group evaluates the complexity, difficulties, and impacts to the operations of the existing railroad intermodal facility.
- Environmental  
This group evaluates the complexity, difficulties, and impacts to the environment, preparing the required environmental documentation, and obtaining construction permits.

For each of these groups, more in depth scoring criteria were used. The following section describes these additional scoring criteria.

### *Right-of-Way*

- Residential  
This criterion evaluates the need for new residential right-of-way to construct the alternative, and the complexity or difficulties in obtaining the new residential right-of-way.

- Commercial

This criterion evaluates the need for new commercial right-of-way to construct the alternative, and the complexity or difficulties in obtaining the new commercial right-of-way.

- Vacant Land

This criterion evaluates the need for new vacant land right-of-way to construct the alternative, and the complexity or difficulties in obtaining the new vacant land right-of-way.

## **Construction**

- Utilities Relocation

This criterion evaluates the complexity or difficulties of relocating existing utilities (power, telephone, gas, water, etc.). A couple of examples are the type of overhead lines (transmission versus distribution), and the size of water line (12 inches versus 6 feet).

- Road Construction

This criterion evaluates the complexity, difficulties, and impacts to existing roadways in constructing the alternative. Some examples are roadway horizontal or profile revisions, stormwater or sidewalk reconstruction, and illumination/traffic signals construction or revisions.

- Impacts Traffic during Construction

This criterion evaluates the complexity, difficulties, and impacts to existing traffic in constructing the alternative. Some impact examples are the number of days and hours for lane or roadway closures, the length of detour routes, and the delays for vehicles to reach their destination.

## **Railroad**

- Railroad Yard Access To and From Freeway

This criterion evaluates the complexity or difficulties of vehicle access from the railroad intermodal facility to the freeway and vice versa. Some examples are the distance a vehicle travels from the intermodal facility to the freeway, the number of signalized intersections a vehicle will cross, and the turning movements (i.e., right turns versus left turns).

- BNSF Yard Access Reliability

This criterion evaluates the complexity, difficulties, and impacts to providing a reliable access to the intermodal facility. The main criterion is the risk associated with an alternative for a closure of a route that restricts access to the facility. This could be due to any reason: bridge closure or collapse, flooding, or road closure.

- Impacts to Railroad Operations

This criterion evaluates the complexity, difficulties, and impacts to existing intermodal facility operations. Some examples are relocating the check-in/check-out facility, relocating the operations building, vehicle circulations within the facility, or access to storage areas.

### *Environmental*

- Air Quality

This criterion evaluates the complexity, difficulties, and impacts of air quality.

- Noise

This criterion evaluates the complexity, difficulties, and impacts of noise to sensitive receivers.

- Historic, Cultural, and Archaeological Resources

This criterion evaluates the complexity, difficulties, and impacts on historical structures and to cultural or archaeological sites.

- Critical/Sensitive Areas

This criterion evaluates the complexity, difficulties, and impacts to critical and sensitive areas.

- Geotechnical

This criterion evaluates the complexity, difficulties, and impacts of geotechnical items to the construction of the alternative.

- Traffic - Operations

This criterion evaluates the complexity, difficulties, and impacts of traffic operations due to the alternative.

- Permitting

This criterion evaluates the complexity, difficulties, and impacts of obtaining permits needed to construct each alternative.

### *Cost*

The last group in the screening matrix is construction cost. This was included for information purposes only. The construction cost was separated into two groups. The first one, Roadway Construction, represents the cost to construct the roadway improvements, or reconstruction of the existing roadway. The second one, Railroad Yard Construction, represents the cost to construct improvements or reconstruct the intermodal facility.



## Scoring Methodology

A numerical scoring system was used to score each alternative. The scoring range was 1-9 with 1 representing the least difficulty or complexity and 9 representing the most difficulty or complexity. With this system, the preferred alternative will have the lowest total.

In addition to a numerical score, a color coding system was implemented in order to provide a quick of the scoring. The colors used were red, yellow, and green. The color assignment for the numerical scores is as follows:

Color	Numerical Score	Description
Green	1 through 3	Low Complexity/Difficulty
Yellow	4 through 6	Medium Complexity/Difficulty
Red	7 through 9	High Complexity/Difficulty

## SCORING OF ALTERNATIVES

The selection criteria matrix was sent to the City of Tukwila and BNSF Railway in order for them to score, independently, each alternative. David Evans and Associates, Inc. also scored each alternative independently. On July 20, 2016, representatives from City of Tukwila, BNSF Railway, and David Evans and Associates, Inc. met to develop a collaborative score for each alternative. The following figure shows the scoring as a result of this meeting.



	SELECTION CRITERIA MATRIX																												
	Right-of-Way					Construction					Railroad					Environmental									Total	Cost			
Alternatives	Residential	Commercial	Vacant Land	Subtotal		Utilities Relocation	Road Construction	Impacts Traffic during Construction	Subtotal		Railroad Yard Access to and from Freeway	BNSF Yard Access Reliability	Impacts to Railroad Operations	Subtotal		Air Quality	Noise	Historic, Cultural, and Archaeological Resources	Critical/Sensitive Areas	Geotechnical	Traffic - Operations	Permitting	Subtotal		Total Score	Roadway Construction Cost (Millions)	Railroad Yard Construction Cost (Millions)	Total Project Cost (Millions)	
Airport Way S	8	9	9	26		9	9	9	27		8	9	9	26		6	1	2	7	4	6	6	32		111	\$19.3	\$90.0	\$109.3	
S 112th Street	8	9	9	26		9	2	4	15		8	4	9	21		7	5	2	7	4	7	7	39		101	\$21.4	\$68.0	\$89.4	
S 124th Street	9	2	3	14		4	9	9	22		6	5	1	12		5	9	9	4	7	8	8	50		98	\$28.9	\$0.0	\$28.9	
Gateway Drive - North Leg	7	9	6	22		7	8	8	23		4	4	1	9		3	6	6	7	7	5	6	40		94	\$23.3	\$0.0	\$23.3	
48th Avenue SE	1	8	6	15		6	7	7	20		3	4	5	12		2	7	6	7	7	5	6	40		87	\$15.9	\$4.4	\$20.3	

**Legend:**

- |     |                              |
|-----|------------------------------|
| 1-3 | Low Complexity/Difficulty    |
| 4-6 | Medium Complexity/Difficulty |
| 7-9 | High Complexity/Difficulty   |

## CONCEPTUAL CONSTRUCTION COSTS AND RIGHT-OF-WAY ESTIMATES

Conceptual construction costs and right-of-way estimates were determined for each alternative. The construction cost estimates were separated into three categories: roadway construction cost (includes bridge construction), railroad construction cost, and right-of-way acquisition cost.

The estimates were by three separate entities. The conceptual roadway construction cost estimates were determined by David Evans and Associates, Inc. (DEA). The railroad costs were determined by BNSF Railway. The right-of-way costs were determined by Abeyta & Associates, a right-of-way specialist, and a subconsultant to DEA.

The following table provides the conceptual costs for roadway construction, roadway right-of-way, railroad facilities construction, and railroad right-of-way.

Alternative	Conceptual Cost Estimate (in millions)				
	Roadway Costs		Railroad Costs		Total
	Roadway	Right-of-Way	Railroad	Right-of-Way	
Airport Way S	\$14.5 – \$19.3	\$0	\$58.5 – \$78.0	\$9.0 – \$12.0	\$98.3 – \$109.3
S 112th Street	\$12.4 – \$16.6	\$3.6 – \$4.8	\$47.7 – \$63.6	\$3.3 – \$4.4	\$80.5 – \$89.4
S 124th Street	\$18.9 – \$25.3	\$ 2.7 – \$3.6	\$0	\$0	\$26.0 – \$28.9
Gateway Drive – North Leg	\$11.3 – \$15.0	\$6.2 – \$8.3	\$0	\$0	\$21.0 – \$23.3
48th Avenue S	\$10.2 – \$13.6	\$1.7 – \$2.3	\$3.3 – \$4.4	\$0	\$18.3 – \$20.4

## CONCEPTUAL PLAN SHEETS

For each alternative, plan sheets were created. These plan sheets show the proposed roadway edges and new right-of-way. Intermodal facility new construction is not included in these plans.

## **Appendix A – Alternative Plan Sheets**

Draft



## **Appendix B – Truck Access Routes**

Draft

## **Appendix C – Roadway Cost Estimate Back-up**

Draft