



HCT Planning

Sound Transit Long-Range Plan Update

Issue Paper S.2: Potential Rail Extensions to Frederickson and Orting

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Sound Transit

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FINAL

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Foreword

This issue paper is part of a series of reports designed to inform the Sound Transit Board in its decision-making on the Regional Transit Long-Range Plan update for the Sound Transit service area. Each issue paper provides information about a specific element or area of the Long-Range Plan and potential options. These reports focus on issues such as costs, ridership, engineering feasibility and operations.

The environmental impacts of the updated Long-Range Plan and Options, as well as potential mitigation measures, are examined in the Draft Supplemental EIS for the Regional Transit Long-Range Plan (December 2004). The Draft SEIS supplements the 1993 EIS prepared on the Regional Transit System Plan, and it generally updates that information and analysis through the year 2030. Public and agency comments on the 2004 Draft Supplemental EIS have been received and will be responded to in a final SEIS to be issued in June 2005.

The Sound Transit Board anticipates identifying a draft updated Long-Range Plan in the spring of 2005. There will be an opportunity for public review and comment on the draft Plan. The Board will adopt a final updated Long-Range Plan after public comments are received on the draft plan and the final SEIS is issued.

References in these reports to Sound Transit's existing Long-Range Plan are to the 1996 Regional Transit Long-Range Vision, which functions as the agency's Long-Range Plan. Discussion of the updated Long-Range Plan refers to the Plan being developed by Sound Transit over the coming months.

The following issue papers are being prepared:

East Corridor

E.1 – I-90/East King County High-Capacity Transit (HCT) Analysis

North Corridor

N.1 – Bus Rapid Transit (BRT) in SR 99 Corridor

N.2 – I-5 Corridor Northgate to Everett HCT Assessment

N.3 – Seattle Streetcar Options

N.4 – SR 522 Corridor HCT Assessment

N.5 – Convertibility of BRT to Light Rail

South Corridor

S.1 – Tacoma Link Integration with Central Link

S.2 – Potential Rail Extensions to Frederickson and Orting

S.3 – HCT System Development Issues in the South Corridor

S.4 – Potential Tacoma Link Extension - West

S.5 – Rail between Burien and Renton

S.6 – Potential Tacoma Link Extension - East

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1. Background

The scoping effort for the update of the Regional Transit Long-Range Plan's Draft Supplemental Environmental Impact Statement (DSEIS) identified two potential rail links to Sounder stations for evaluation as Options. One potential passenger rail link is an 11.0 mile line between downtown Tacoma and Frederickson using existing track currently owned by Tacoma Rail. The second passenger rail link would be from the existing Sumner Sounder Station to the community of Orting using existing 4.7 mile track owned by Meeker Southern Railroad.

2. Purpose of the Issue Paper

The purpose of this issue paper is to evaluate potential rail extensions to Frederickson and Orting as potential amendments to ST's Long-Range Plan. Several considerations were addressed as part of the assessment. These considerations include current and projected land use characteristics of the two corridors, estimated ridership in 2030, and estimated costs.

3. Key Findings

This review of potential connections to Sounder stations from Frederickson and Orting indicate the following key findings:

- While both corridors are expected to grow in terms of either population or employment, the estimated ridership levels for the potential connections to Sounder are as follows:
 - Approximately 830 trips per day for Frederickson-Tacoma Dome connection
 - Approximately 200 trips per day for Orting-Sumner connection
- The ridership for a potential passenger rail link to Frederickson is influenced by low industrial density development in the Frederickson station area. Also, parking is expected to remain free-of-charge to employees.
- The ridership for a potential passenger rail link to Orting is influenced by low density residential development located near the proposed station.
- For a potential Frederickson connection, bus transit access could be improved with the future completion of the Cross Base Highway connecting I-5 with south Pierce County.
- For most of the Fredrickson area, access to Sounder stations is available at the Puyallup and Sumner stations and would still exist with rail service to Frederickson.
- The estimated cost range for a potential Frederickson-Tacoma Dome passenger rail link is between \$200 million and \$250 million (2004 dollars)
- For residents in the Orting area, access to Sounder service is available at the Puyallup and Sumner stations and would still exist with rail service to Orting.
- An estimated cost for an Orting-Sumner passenger rail link is between \$80 million and \$100 million (2004 dollars).

4. Characteristics of the Corridors

This section describes characteristics of the two corridors that are being considered for rail connections to Sounder commuter rail stations in Pierce County. These characteristics include current operating conditions of the tracks, track ownership, nearby land uses, and potential travel patterns affecting the station areas.

If implemented, rail service along these corridors would be designed to operate as shuttles, which could operate in both peak and non-peak periods. Since passenger demand for these shuttles is not expected to be as high as other high capacity transit lines in the



region, the vehicles would likely be diesel multiple units (DMU's). DMU's can operate as single, self-propelled cars versus the multi-unit trains that serve Sounder stations. They operate without the need for separate locomotives that push or pull passenger coaches.

4.1 Frederickson Connection

Figure 1 identifies the alignment of a potential rail connection between the Tacoma Dome station and Frederickson. Currently, the Mountain Division of Tacoma Rail operates limited freight service along this line. For purposes of this paper, new stations would be located in the vicinity of 57th Street E. at D Street, 18th Avenue E. at SR 512, and the Frederickson Industrial Area. The station spacing allows access to the service between Tacoma and Frederickson while still allowing operating speeds that are competitive with auto travel.

4.1.1 Track Conditions and Ownership

The Tacoma-Frederickson line is a single track. In Tacoma, the line joins the east-west Burlington Northern Santa Fe line west of the Tacoma Dome station. The line is currently classified as *excepted*. This rating allows the track to be excepted from regulations and safety rules of the Federal Railroad Administration. The excepted rating allows some use of the track but at low operating speeds. The classification is not generally sufficient to allow passenger rail service.

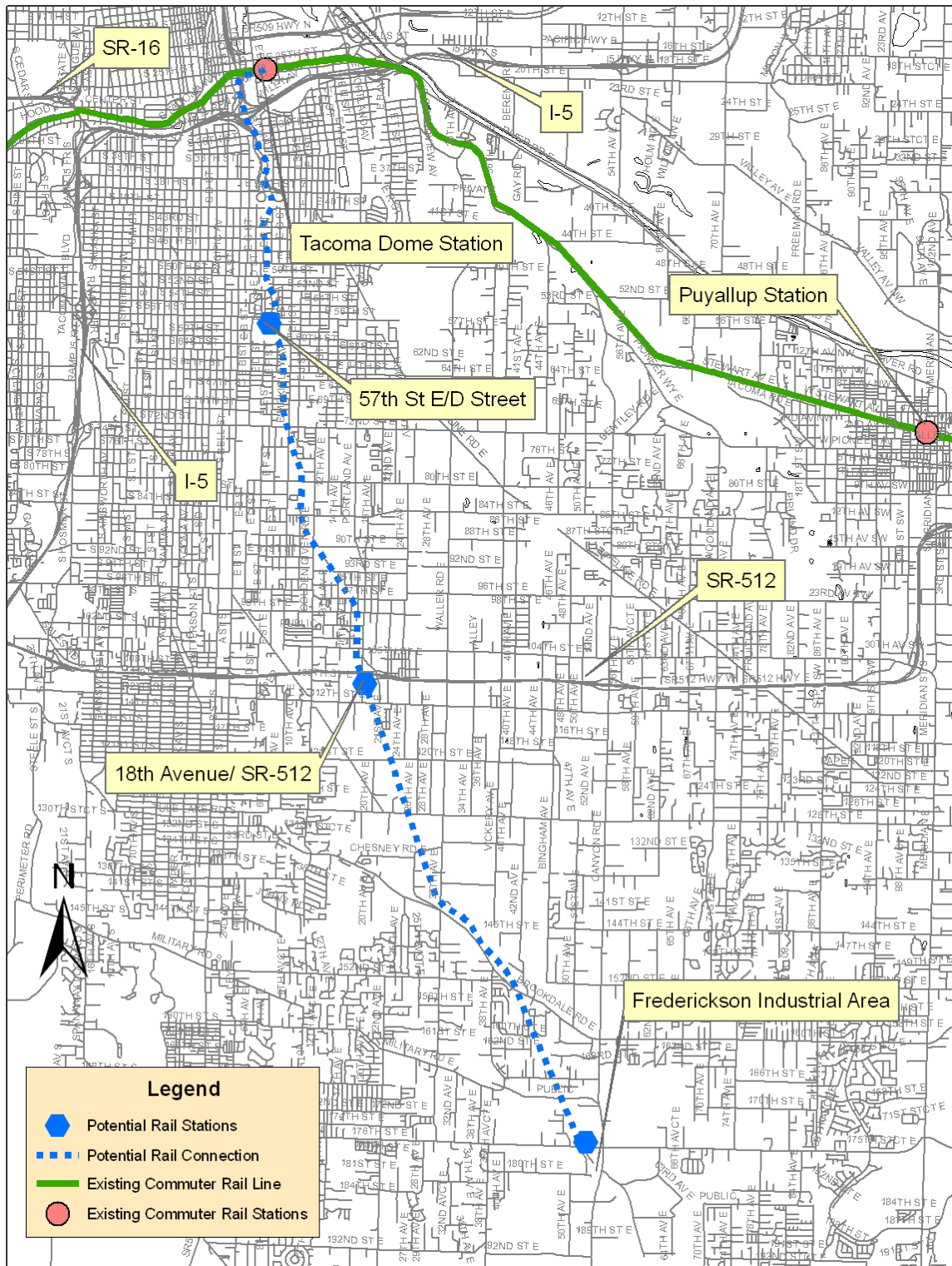


Figure 1: Potential Rail Connection – Frederickson

The Tacoma-Frederickson track will need to be upgraded to Class 3 to allow passenger rail service to operate at speeds that that will be competitive with auto and bus travel speeds. Also, along some portions of the existing track, grades are 3.3 percent. The extent of track grade will require improvements to allow higher operating speeds as compared to what is currently being provided by Tacoma Rail freight trains.

Ownership of the existing track by Tacoma Rail could present some institutional issues for ST. Since the start of implementation for *Sound Move*, ST has negotiated with Burlington Northern Santa Fe (BNSF) Railroad regarding use of tracks, payment for leases, etc. Any use of the Frederickson line would require a new set of negotiations with a different owner and operator.

4.1.2 Land Use Characteristics at Station Areas

Land use characteristics along the Tacoma/Frederickson line vary but are dominated by low density housing along most of the alignment. At the north end, there is no high-density employment in the immediate area of the Tacoma Dome station. However, riders could transfer to Tacoma Link, which serves employment and other activities in downtown Tacoma; riders could also transfer to existing Sounder service operating to various locations on the Tacoma-Seattle line.

Between downtown Tacoma and Frederickson, the connection would serve an area dominated by single family housing and neighborhood commercial areas. The corridor is within ST's existing boundaries. At the Frederickson end of the connection, land use is heavily industrial. The Frederickson Industrial Area is one of eight *Manufacturing Industrial Centers* designated by the Puget Sound Regional Council. Estimated Year 2000 employment in the Frederickson Manufacturing Industrial Center was approximately 1,700¹. This Center encompassed approximately 2,800 acres². Employment sites in this industrial center are spread out in a large area and parking is provided free of charge to workers.

Thus, as compared to large and more compact central business districts such as Tacoma, Everett, and Seattle, the combination of lower densities and continued availability of free parking in Frederickson would not likely result in the area being regarded as a major market for rail transit. However, given the potential for large employers who would be subject to the state's Commute Trip Reduction program, combined with other local policies designed to encourage denser commercial development and reduce the availability of free parking, the area could mature over time into a transit-supportive environment.

¹ US Bureau of the Census, Washington State Employment Security Department, and Puget Sound Regional Council

² US Bureau of the Census and Puget Sound Regional Council

4.1.3 Future Transportation Developments Affecting Frederickson Rail Service

Although there is no rail service along the Tacoma/Frederickson corridor, access to passenger rail service still exists for residents along the corridor at the Tacoma Dome and Puyallup Stations. Under *Sound Move*, Sounder commuter rail service will gradually expand to 18 trips per weekday (9 roundtrips) from the current six trips per day (three roundtrips). Under the 1996 Regional Transit Long-Range Plan, additional expansion of Sounder could occur.

A potential passenger rail connection between Frederickson and the Tacoma Dome station will provide an opportunity to access this expanding service. This access, however, will require a transfer at the Tacoma Dome station.

Consideration of a passenger rail link between Frederickson and Tacoma should also recognize the potential construction of the Cross Base Highway. The alignment for this new highway is shown in Figure 2.

The Cross Base Highway would provide opportunities for improved public transit connections to the Frederickson area. These improvements include a new ST Express regional bus route that is identified in ST's 1996 Long-Range Plan Alternative in the Supplemental Environmental Impact Statement. This route will provide a quick connection to South Pierce County from the I-5 corridor, including transfer opportunities to other ST Express routes and, with potential extension of commuter rail to DuPont, to a future Sounder station.

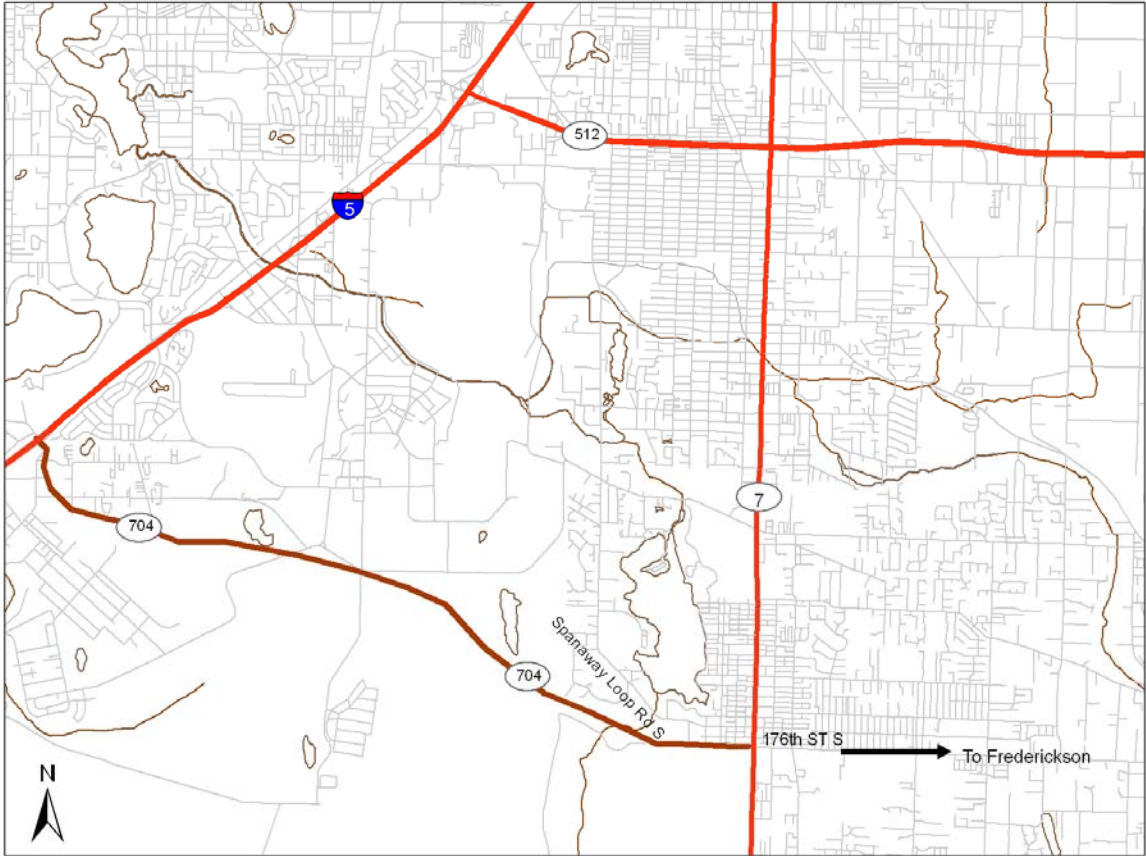


Figure 2: Proposed Cross Base (SR 704)

4.1.4 Travel Patterns

Although residential densities along the Frederickson connection are projected to remain low through 2030, high density employment levels in downtown Tacoma and downtown Seattle could attract some riders from the area. However, both current and projected levels of transit demand between Frederickson and these major employment destinations are low. Table 1 identifies the potential work-related transit market between Frederickson and locations along the existing Sounder line as well as future stations. This estimate reflects general potential transit demand that passenger rail is trying to serve.

**Table 1:
Total Potential Home Based Work-Related Transit Trips (Daily)
between Frederickson and Selected Locations**

Travel Corridors	2002 Daily Trips	2030 Daily Trips
Downtown Seattle / Frederickson	20	110
North Tacoma / Frederickson	70	200
South Tacoma / Frederickson	100	200
Lakewood / Frederickson	20	40

Source: Sound Transit Ridership Model

Despite the significant percentage gain, the estimated low volumes in 2030 for the work-related transit market between downtown Seattle and Frederickson are of particular importance. Among the various regional connections, the downtown Seattle/Frederickson market is important to note given the high density employment in downtown Seattle as well as the relatively high parking costs as compared to other employment destinations.

4.2 Orting Connection

Figure 3 identifies a potential rail connection between the existing Sumner Sounder Station (Main Street and Traffic Avenue), and Orting. Currently, the Meeker Southern Railroad Rail operates a few freight trips per week along this line. For this connection, a single station is identified at the terminus of the line north of Orting. The north terminus of the connection would be located at the existing Sumner Sounder station.

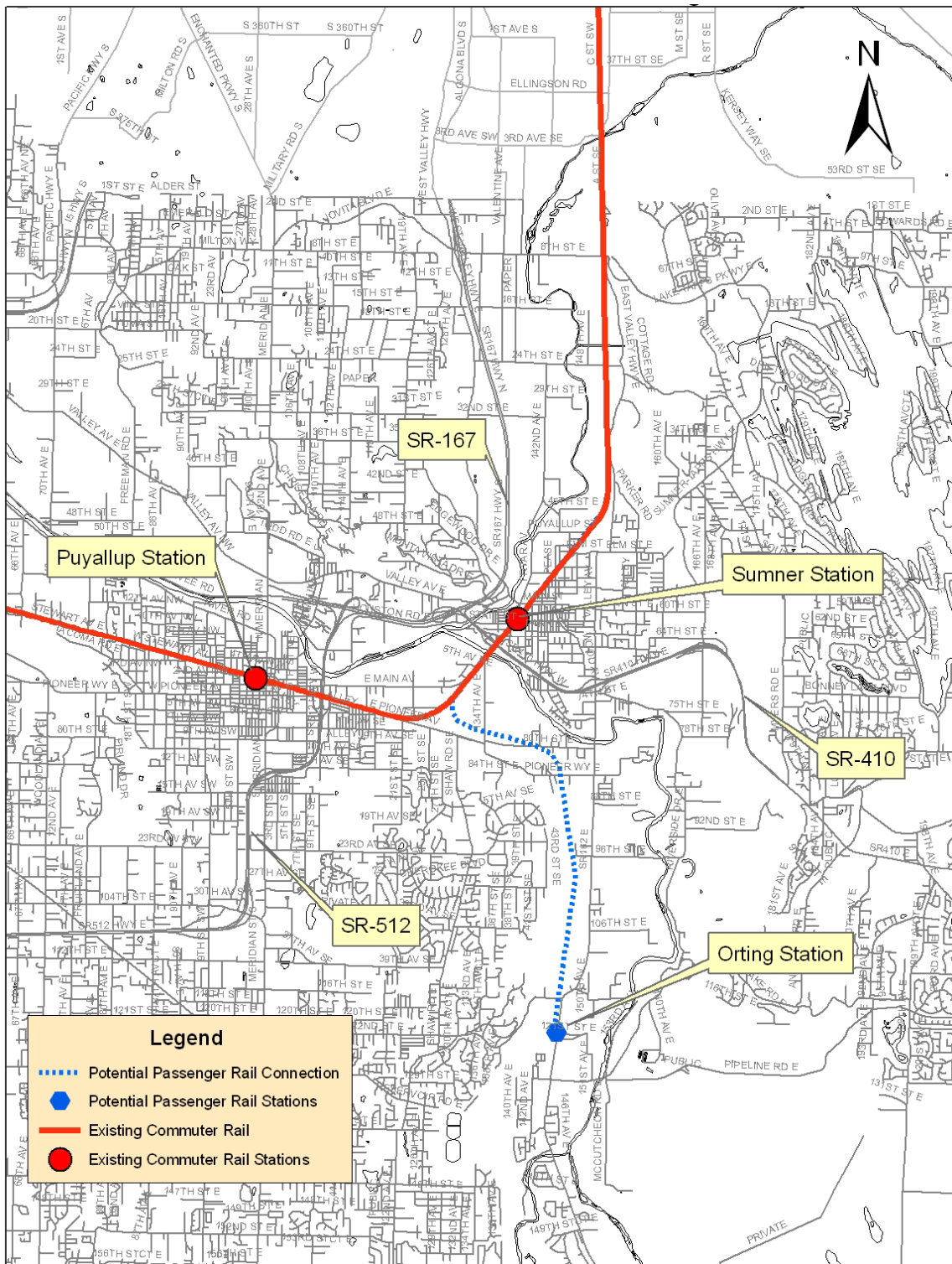


Figure 3: Potential Rail Connection – Orting

4.2.1 Track Conditions and Ownership

As is the case with the Tacoma-Frederickson line, the Orting-Summer line is a single track. The line is currently classified as *excepted*. This rating allows the track to be excepted from regulations and safety rules of the Federal Railroad Administration. The excepted rating allows some use of the track but at low operating speeds. The classification is not generally sufficient to allow passenger rail service.

The current configuration of the track serving Orting involves a connection with the BNSF line south of the existing Summer Sounder station. Therefore, northbound rail vehicles coming from Orting will connect with the BNSF mainline and then operate north to the Summer Station. The reverse would take place for rail trips going south from Summer to Orting. Due to this track sharing, the shuttle service would use valuable capacity on BNSF's main line. This track sharing would likely require re-opening negotiations with BNSF for passenger rail access.

Ownership of the track by Meeker Southern Railroad could present some institutional issues for ST. Since the start of implementation for *Sound Move*, ST has negotiated with Burlington Northern Santa Fe (BNSF) Railroad for use of tracks, payment for leases, etc. Any use of the Summer-Orting line would require a new set of negotiations with a different owner and operator.

4.2.2 Land Use Characteristics at Station Area

Land use characteristics along the potential Summer/Orting passenger rail line are dominated by low-density housing and open space. The line is within ST's existing boundaries. At the north end, the immediate area of the Summer station does not have high density employment that would normally attract passenger rail ridership. In addition, parking is free for people working at Summer businesses. At the Summer Station, riders could also access existing Sounder service operating to downtown Seattle and locations along the way. Some of these locations have either high employment densities or high daily parking costs for or both.

At the Orting end of the connection, land use is characterized by low-density residential developments with most of the potential travel market located west of a potential rail station. However, much of this housing is located on a ridge west of a potential Orting Station with limited access to the station area. As indicated in Figure 3, the residents in this area have more convenient access to the existing Puyallup Sounder Station located at Meridian Street North and West Main Avenue. Also, using the Puyallup Station eliminates the need for transferring.

4.2.3 Travel Patterns

Although residential densities at a potential Orting Sounder station are projected to remain low through 2030, high density employment levels in downtown Tacoma and downtown Seattle could attract some riders from this area. However, as is the case with Frederickson, current and projected levels of travel between Orting and these major employment destinations are low.

Table 2 identifies the potential work-related transit market between Orting and locations along the existing Sounder line. While some growth in demand will occur, residential growth in the immediate area of the Orting Station will be limited. This area is currently outside the Urban Growth Boundary. Therefore, future high density residential or other developments similar to what has occurred in the vicinity of existing Sounder stations (e.g. Kent Station) will not likely occur at a potential Orting Station.

**Table 2:
Home Based Work-Related Transit Trips (Daily)
between Orting and Selected Locations**

Travel Corridors	2002 Daily Trips	2030 Daily Trips
Downtown Seattle / Orting	70	270
North Tacoma / Orting	20	60
South Tacoma / Orting	10	20
Lakewood / Orting	5	20

Source: Sound Transit Ridership Forecasting Model

5. Ridership and Cost Estimates

This section describes estimated ridership and capital costs for potential connections to Sounder service from Frederickson and Orting. Ridership estimates were identified as part of the DSEIS issued in December 2004 and prepared for the update of ST's Regional Transit Long-Range Plan. Capital costs for each line assume a upgrading of the existing track in order to allow appropriate operating speeds for future passenger rail service.

5.1 Ridership Estimates

Table 3 identifies estimated ridership levels for the Frederickson and Orting passenger rail connections. The table identifies the daily ridership as well as assumed service headways (time between trains) for these connections. Service along the Orting connection is assumed to occur during peak periods only while the Frederickson connection would operate during peak and off-peak periods.

Table 3: Estimated 2030 Ridership for Potential Sounder Connections

Potential Rail Connection Corridor	Estimated Daily Ridership	Frequency of Service
Tacoma / Frederickson	830	30 minutes - All day
Sumner / Orting	200	30 minutes - Peak Periods ³

Source: Sound Transit Ridership Forecasting Model; for Sumner/Orting, estimates have been provided by ST staff

³ Assumes six one-way trips from 6:00 to 9:00 AM and six one-way trips from 3:00 to 6:00 PM

To provide a perspective on ridership estimates for the Frederickson and Orting passenger rail connections, comparisons can be made with ridership forecasts that were done for potential HCT developments in the ST service area. These ridership estimates were identified in the Draft SEIS for the updated Regional Transit Long-Range Plan. (See Regional Transit Long-Range Plan Draft Supplemental EIS, Table 4.9-16, p. 4.9-45)

5.2 Cost Estimates

Cost estimates identified in this issue paper did not involve detailed engineering for either potential passenger rail connection. The estimates are provided to allow comparisons with potential ridership levels for each potential connection as well as other factors that can affect a final decision on including the rail connections in the updated Regional Transit Long-Range Plan.

Potential rail connections would operate on existing tracks that are currently being used for low-volume, low-speed freight traffic. To provide adequate operating conditions for passenger rail service, including train speeds that result in travel times that are competitive with bus and auto, substantial costs would need to be committed to track upgrades.

The existing track classification for the Orting-Summer line is regarded as *excepted* and it will need to be upgraded to at least a Class 3 level to allow passenger rail service. The Frederickson line is of better quality than the Orting line (e.g. higher operating speeds are permitted); however, it would still have to be upgraded substantially to allow passenger rail service to operate at adequate speeds.

One approach to conceptual cost estimates for the Sounder connections involves using estimates done for the commuter rail extension from downtown Tacoma to Lakewood. Cost estimates have been completed by ST staff and work is proceeding with design for stations and track upgrades. Total cost for the Lakewood extension was estimated at approximately \$204.0 million. Some of this cost included new right-of-way, which would not be required the Frederickson or Orting rail connections.

The cost estimate completed for the Tacoma-Lakewood Sounder extension includes direct construction costs. The estimate also addresses items such as agency overhead, engineering and design construction management, legal and public outreach costs, and permitting.

Vehicle costs were also included in the cost estimate for the Lakewood extension. However, these vehicles (locomotives and coaches) assumed a rail operation similar to what is currently operating on Sounder between Everett and downtown Seattle and downtown Seattle and Tacoma. For potential Frederickson and Orting rail connections, DMU vehicles have been assumed and are included in the total cost estimates identified below.

On a per mile basis, ST staff identified the estimated cost of the Lakewood extension (excluding any right-of-way costs and vehicles costs) at \$16.0 million⁴. Using this per mile unit cost and applying it to the potential rail connections, the estimated costs (2004 dollars) for the passenger rail connections are as follows:

- Frederickson: Between approximately \$200 million and \$250 million
- Orting: Between approximately \$80 million and \$100 million

⁴ Sound Transit staff estimates; January 2004