Sounder South Strategic Development & Implementation Plan

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SoundTransit

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Revision History

Version	Title	Date	Notes, As Required
1	Draft	1/23/2020	
2	Final	4/1/2020	

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EXECUTIVE SUMMARY

Introduction

This Sounder South Strategic Development and Implementation Plan summarizes Sound Transit's approach to expanding Sounder South capacity to meet future anticipated demand. The plan is grounded in voter approved investments described in the Sound Transit 3 Plan and informed by a robust technical analysis and public input. The strategy to expand capacity articulated in this plan includes capital investments to extend train sets and platforms up to 10-cars and add train trips and corresponding track and signal improvements, pending the outcome of negotiations with BNSF Railway (BNSF), which owns the tracks Sounder operates on between Tacoma and Seattle. The analysis indicates, based on current ridership projections, that additional rider capacity is needed in the mid-2020's and the second half of the 2030's. The Plan is intended to be flexible to respond and adjust to ridership demand over time. Sound Transit intends to pursue longer trains and more trips during both of these periods, while remaining flexible and consistent with ridership demand.

Sound Transit 3 (ST3) Plan

The Sound Transit Board adopted the ST3 Plan in June 2016, and regional voters within the Sound Transit district approved it in November 2016. The ST3 Plan called for expanding the regional high-capacity transit system to improve connections between major cities with light rail, bus rapid transit, commuter rail, and express bus services. The ST3 Plan projected increased demand for Sounder South service due to increasing population and employment over the coming 25 years. To meet this demand, the ST3 Plan established a general framework for expanding the capacity of Sounder South commuter rail service and enhancing service, with an allocation of $934 million in 2014$. It identified longer trains and improvements to support additional service as the two primary methods for adding capacity.

> **ST3 Plan Description**: "***The Sounder south line capital improvement program helps meet growing demand for service by increasing system capacity and enhancing service.*** *This program includes expanding platforms to accommodate up to 10-car trains, allowing Sound Transit to run longer trains and carry more riders. Access elements include improvements for pedestrians, bicyclists, buses and private vehicles, prioritized under Sound Transit's System Access Policy. In addition, depending on affordability and cost-effectiveness, track and signal upgrades and other related infrastructure will provide capacity for additional trips."*

Sounder South Strategic Development and Implementation Plan

Sound Transit is planning to move forward with Sounder South improvements by developing a strategic expansion plan to prioritize investments that add more passenger capacity to the system. The Sounder South Strategic Development and Implementation Plan (SDIP) is that plan. The SDIP presents a strategy to give Sound Transit the flexibility to tailor a series of capacity enhancements to address expected changes in ridership demand between now and 2041, the ST3 Plan horizon year. To support the approach, the plan:

- Presents strategies to expand Sounder South capacity to serve a growing travel corridor in the future;
- Documents existing conditions and the history of Sounder South operations to date, including a detailed description of Sounder fleet and facilities;

- Forecasts future Sounder South ridership;
- Examines variables affecting Sounder capacity expansion and simulates alternative operating scenarios to inform options for expanding capacity; and
- Describes potential planning and delivery of Sounder South capacity improvements.

Sounder Expansion Strategy

This SDIP establishes a program of improvements to the Sounder South corridor that would enable Sound Transit to meet forecasted ridership demand and maintain service quality over the life of the ST3 Plan. The approach includes a strategy to address Sounder South ridership growth within the next few years, and provides a flexible approach for adding capacity as needed. To inform these strategies, the SDIP establishes two categories of Sounder capacity: (1) "fixed" capacity, for which Sound Transit has the discretion to develop and implement with relative certainty; and (2) "flexible" capacity, which refers to additional Sounder round trips and/or expanded hours of operation. Flexible capacity is subject to agreement with BNSF, who owns most of the corridor on which Sounder operates.

Strategy One: Longer Trains

Strategy One for Sounder South service focuses on adding fixed capacity through a program of station platform extensions and additional fleet to accommodate the operation of 10-car trains as soon as possible. The ridership forecast discussed later indicates demand will likely grow and reach current Sounder seated capacity during peak commute hours within the next three to five years. Left unaddressed, this condition could lead to trains operating during the busiest times with a growing number of standing passengers. Extending train lengths would provide sufficient capacity to accommodate expected ridership growth over the next 10 years and meet Sound Transit's service standards within a reasonable timeframe. The strategy includes station improvements to ensure passengers have safe, convenient access to longer trains. Planning, design, and construction of these improvements and acquisition of additional fleet would take between five and a half and eight years.

Fixed Capacity Investments at a glance:

- Extended station platforms
- Additional coaches
- Improved access to longer trains
- Expanded storage and maintenance

Strategy Two: More Trips

Flexible Capacity Investments at a glance:

- Capital improvements to track and signals
- Additional coaches and locomotives
- Expanded service when needed
- Expanded storage and maintenance
- Subject to agreement with BNSF Railway

Strategy Two is to work with BNSF to identify the timing of new trips to add a program of flexible capacity improvements that can be tailored to meet demand. Sounder South ridership will likely continue to grow as the communities along the corridor grow. Ridership growth over the next few years may be sufficient to cause crowding during the busiest travel times. Adding an additional trip, subject to agreement with BNSF, could provide sufficient capacity during peak travel demand to accommodate such demand. Ridership will likely adjust with the opening of light rail segments, Federal Way Link in 2024 and Tacoma Dome Link in 2030, as transit system users begin to use all available high capacity transit modes to meet their needs. Following those adjustments, Sounder South ridership will likely increase again, including when the service extends to

Tillicum and DuPont in 2036. Flexible capacity would enable Sound Transit to schedule improvements as demands change. Sound Transit plans to negotiate with BNSF to define the timing and requirements for service increases in response to future travel demand, and final decisions would be subject to joint agreement.

Figures ES-1 and ES-2 conceptually show how the two strategies could address Sounder South ridership over the life of the ST3 Plan. Specifically Figure ES-1 shows how longer trains could address the demand in the peak hour. Figure ES-2 shows how adding more round trips could influence weekday ridership over time. Note that the higher capacity shown for 8-car trains in Figure ES-2 results from proposed increased train frequency. With 15-minute headways, four 8-car trains provide 32 total coaches within the peak 60-minute period. By contrast, three 10-car

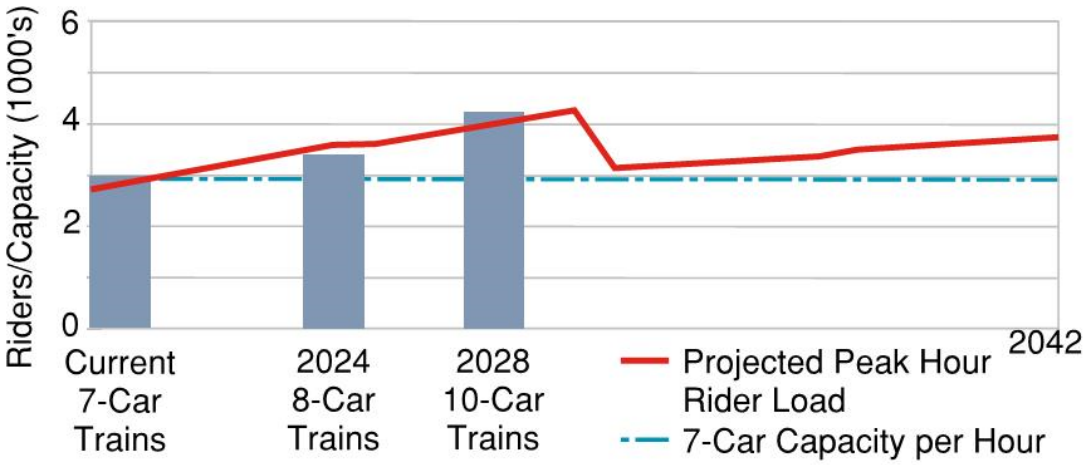

Figure ES-1 Sounder South Strategy One – Longer Trains: Peak Hour Demand Forecast and Proposed Capacities

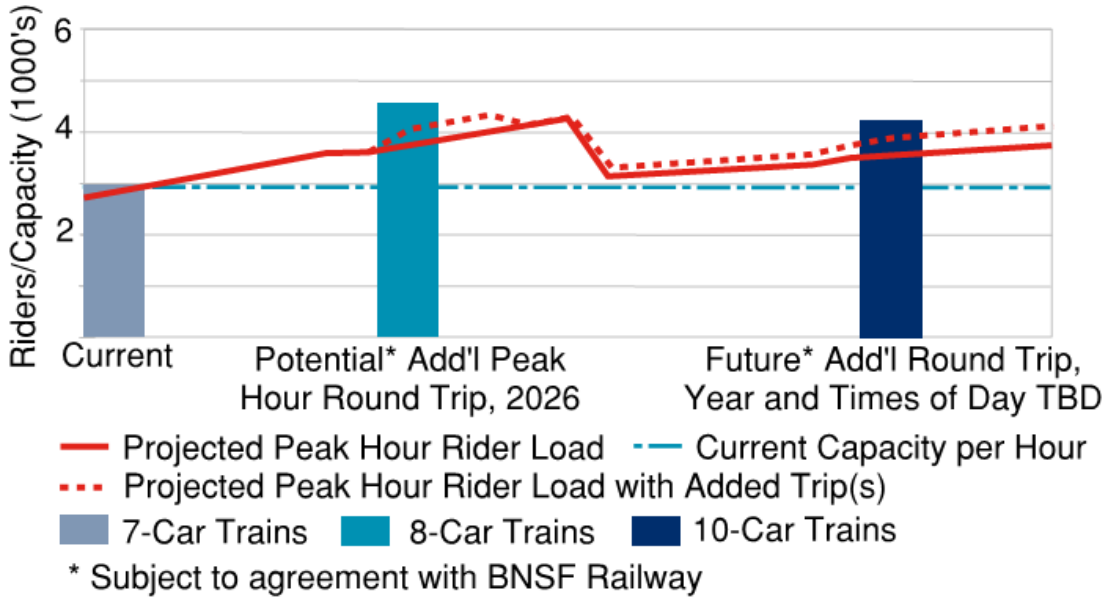

Figure ES-2 Sounder South Strategy Two – More Trips: Peak Hour Demand Forecast and Potential Added Round Trips

trains provide 30 total coaches in 60 minutes assuming 20-minute headways. The additional of new train trips is contingent on the outcome of negotiations with BNSF Railway. Section 4 describes the strategy in greater detail.

Summary of SDIP Technical Analyses

The SDIP strategies rest on robust technical analyses. The analytical tools described herein are documented in supplemental technical memoranda. The first step was to document the existing conditions in the Sounder South corridor in a Comprehensive Operations Assessment (COA). The COA provided a baseline for understanding possible improvements to the system. With the COA complete, the ST3 Plan ridership projection for the corridor was reviewed and updated. Next, Sound Transit defined a set of capital and operating improvement scenarios to quantify the capacity of each to meet projected demand. A simulation model was then used to evaluate four service expansion scenarios, and capital improvements to accommodate the anticipated schedules for each were developed. These steps were followed by development of conceptual comparative cost estimates and ridership projections for each scenario. Sound Transit also conducted public outreach to gather input and ideas regarding options for expanding Sounder capacity. This outreach involved describing the choices and trade-offs under consideration, and analyzing the public's feedback to help inform the content of the SDIP. A brief description of each key task follows.

Existing Conditions

The COA describes the operational characteristics of Sounder South commuter rail service since its inception in the year 2000, including ridership, schedules, on-time performance, and other performance metrics. The COA describes the operating environment Sounder navigates, including the right-of-way (ROW) between Seattle's King Street Station and Tacoma owned by BNSF and the Sound Transit-owned ROW between Tacoma and DuPont. The COA shows a clear response of increased ridership with each incremental expansion of Sounder South service, indicating additional trips generally induce demand. It captures the full inventory of Sounder capital facilities, including stations, maintenance and storage facilities, and fleet. It provides details on the chronology of Sounder expansion to date, as well as the dates of acquisition and maintenance intervals of fleet, including coaches, cab cars and locomotives, and passenger facilities. To provide industry context for expansion of Sounder service, the COA also includes a peer system assessment, which provides comparable information for four other systems in the country that provide commuter rail service similar to Sounder. Those systems included Frontrunner, Altamont Commuter Express (ACE), Metrolink, and Virginia Railway Express (VRE). While no two commuter rail systems are identical, the peer agency assessment offers insights to help inform the strategies for Sounder expansion included in this SDIP.

Capacity Expansion Scenarios

To support identification of appropriate investments in the two strategies, the SDIP examined a series of capital and operating scenarios to better understand how Sound Transit can meet long-term growth in demand for Sounder South service. These scenarios tested four variable factors in Sounder South service: train length, train frequency, hours of train service, and number of daily train trips. Specifically, the scenarios examined the capacity improvements that could be gained by:

- Increasing train lengths from seven cars today to eight, nine, or 10 cars;
- Increasing frequency during the peak commute period from a train every 20 minutes today to one every 15 minutes;
- Adding more round-trips to the schedule; and
- Broadening the hours of service into mid-morning, early afternoon, and evening.

The scenarios were used to determine the anticipated reliability of each schedule, the capital improvements necessary to maintain efficient operation of freight and passenger services, potential operating and capital costs for each, and potential ridership.

Ridership Analysis

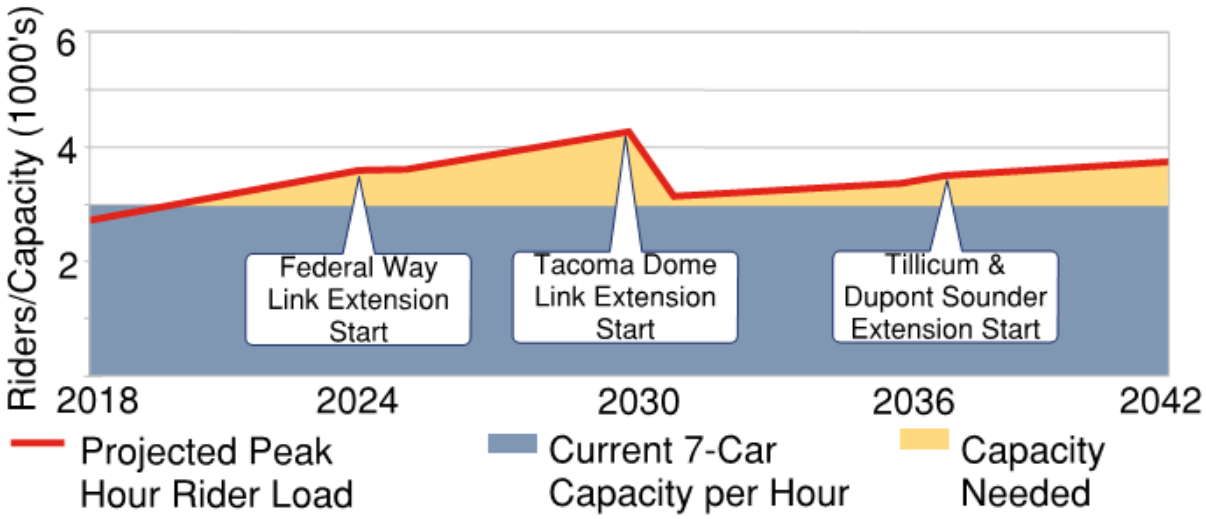

Figure ES-3 Sounder South PM Peak Hour Ridership Projections and Existing Capacity

As stated previously, the ST3 Plan estimated ridership for Sounder South corridor service as part of the overall regional transit system forecast for the ST3 Plan's horizon year of 2041. The SDIP ridership analysis began with a review of the ST3 Plan's assumptions for Sounder South service and expected ridership, and then updated those assumptions to reflect scenarios examined by this plan. As noted above, the resulting forecast shows continued robust growth in Sounder South ridership, sufficient to exhaust the system's existing capacity for seating within the next few years during peak commute periods.

Figure ES-3 shows projected maximum ridership during the peak hour, the busiest part of peak period. The forecast also shows a discernible pattern in which Sounder South ridership temporarily drops twice during the period between now and 2041. These adjustments in ridership correspond to the opening of light rail segments running parallel to Sounder South commuter rail in the south corridor. The first ridership drop is relatively minor and occurs when the Federal Way Link light rail segment opens in 2024. The second is larger and occurs when the Tacoma Dome Link light rail segment opens in 2030. In both cases, Sounder South ridership subsequently recovers and continues to grow steadily because of anticipated population and employment growth in the corridor, and the extension of service to Tillicum and DuPont in 2036.

Key Findings

Examination of existing conditions, factors influencing trip scenarios, and ridership analysis provided these key findings:

- Ridership trends are consistent with previous estimates, with strongest ridership being in the peak period.
- There is a potential to meet future demand by lengthening trains and platforms.
- There is a connection between Sounder South and Link ridership. Sounder South ridership temporarily declines when Federal Way Link Extension and Tacoma Dome Link Extension begin operations. Sounder South ridership recovers over time due to anticipated population and employment growth.
- Additional trips induce demand, which drives ridership higher.
- The BNSF tracks are congested by freight trains in off-peak times, limiting the available track time for passenger trains outside morning and afternoon peak travel periods.
- 15-minute headways for Sound South trains could pose risks to reliability.
- The cost of capacity improvement for evening trips may exceed rider benefit.

Public Engagement

Sounder enjoys strong ridership and a devoted, repeat customer base. The south corridor line is a significant presence in the eight cities it serves. Sound Transit placed a high priority on engaging customers and citizens in the corridor to ensure their feedback would help shape this plan. The agency asked for feedback on choices related to service frequency, train length, span of service, and number of trips. Using a combination of online surveys, focus groups, and advertised open houses at stations, Sound Transit received a robust public response. Section 3 describes the outreach effort in detail and presents results. Common themes from the feedback include a strong desire for consistent, on-time service; interest in adding more trips; support for longer trains to serve more riders; and requests for improved circulation and amenities at stations.

Putting the SDIP in Place

For improvements called for in this SDIP, Sound Transit plans to undertake project-level planning and project development activities that would include, as appropriate, alternatives analysis, preliminary design, environmental review, external engagement, and coordination with partners, stakeholders, tribes, and host jurisdictions. For fixed-capacity improvements, including longer platforms and related passenger access features, Sound Transit plans to work with cities, the public, and BNSF to coordinate design activities and provide environmental documentation. For track and signal improvements to accommodate changes to service, Sound Transit plans to work with BNSF, the Federal Transit Administration (FTA), and other key stakeholders to define necessary improvements, secure agreements to enable implementation, and provide supporting environmental documentation. In addition, Sound Transit plans to work with Amtrak and the Washington State Department of Transportation Rail Office to coordinate plans and services. Figure ES-4 presents the proposed investment approach to implementing both the operation of longer trains (Longer Trains and Platform Extensions) and more round trips (Potential Additional Service) and focused station access improvements.

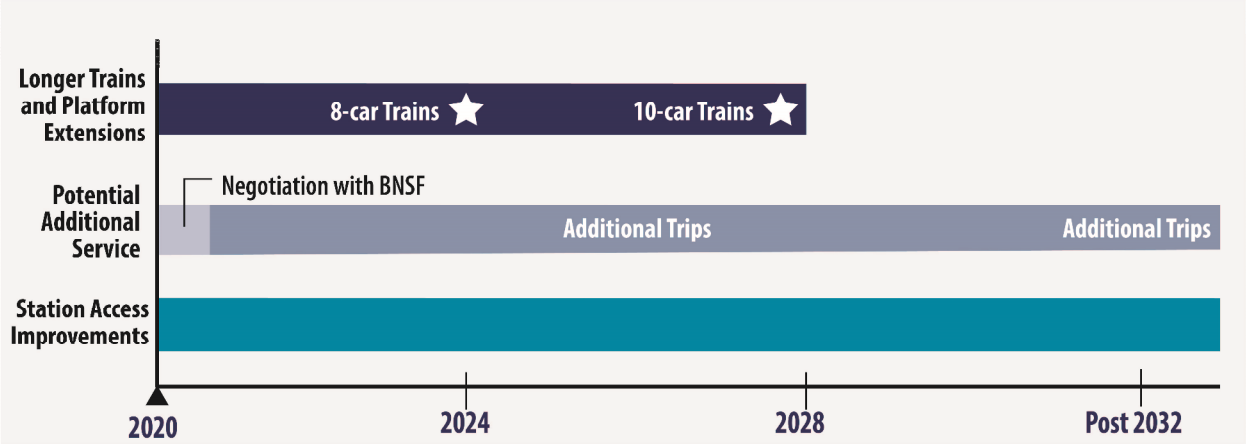

Figure ES-4 Sounder South Proposed Investments Approach

All Sounder improvements under this plan would be carried out within the parameters of Sound Transit's system access, transit integration, sustainability, and transit-oriented development policies and practices. Project development activities are described in Section 4. Sound Transit anticipates planning and implementation for individual projects identified in the SDIP to begin on a rolling basis starting in 2020.

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Acronyms

ADA	American's With Disabilities Act
BNSF	BNSF Railway
COA	Comprehensive Operational Analysis
FEIS	Final Environmental Impact Statement
FRA	Federal Railroad Association
PSRC	Puget Sound Regional Counsil
ROW	Right-of-Way
RTC	Rail Traffic Controller
SDIP	Sounder South Strategic Development and Implementation Plan
SEIS	Supplemental Environmental Impact Statement
SEPA	State Environmental Policy Act
TIP	Transportation Improvement Program

1 INTRODUCTION – THE SOUNDER SOUTH STRATEGIC DEVELOPMENT AND IMPLEMENTATION PLAN

Sounder South corridor commuter rail service has been a mainstay, high-capacity transit option for residents of South King and Pierce counties since its debut in 2000. Starting with a modest two weekday round trip service, Sounder has grown to 13 round trips serving over 16,000 riders each weekday. The service offers primarily rush hour, peak direction trips about every 20 minutes northbound in the mornings and southbound in the afternoons. Trains serve stations in Lakewood, South Tacoma, Tacoma, Puyallup, Sumner, Auburn, Kent, Tukwila, and Seattle.

Sounder South commuter trains offer a high-capacity transit option capable of moving significant numbers of people during the busiest commute hours. Trains have diesel locomotives propelling seven, double-decker passenger cars with a seated capacity of nearly 1000 people. These coaches provide comfortable seating, work tables, power outlets, on-board Wi-Fi, bicycle storage, and restrooms. They operate on tracks owned by the BNSF Railway (BNSF) between Seattle and Tacoma, and on tracks owned by Sound Transit between Tacoma and Lakewood. In the future, Sound Transit plans to run trains farther southwest on Sound Transit-owned tracks to stations in Tillicum and DuPont. With a predictable schedule and generally reliable on-time performance, Sounder South has earned consistent high marks from its customers.

The communities served by the Sounder South service are projected to continue growing, as population and employment in the region grow. To continue providing a reliable commute option, Sounder would need to grow along with them. The Sound Transit 3 (ST3) Plan passed by voters in 2016 provided resources – $934 million (in 2014$) – to support growth in Sounder South capacity in coming years. The ST3 Plan established a general framework for expanding the capacity of Sounder South commuter rail service and enhancing service.

This Sounder South Strategic Development and Implementation Plan (SDIP) provides an opportunity to study the corridor and work with partners to develop a system plan. The SDIP presents a flexible strategy to tailor a series of Sounder capacity enhancements to address expected changes in ridership demand between now and 2041, the ST3 Plan horizon year. To support the approach, the plan:

- Presents strategies to expand Sounder South capacity to serve a growing travel corridor in the future;
- Documents existing conditions and the history of Sounder South operations to date, including a detailed description of Sounder fleet and facilities;
- Forecasts future Sounder South ridership;
- Examines variables affecting Sounder capacity expansion and simulates alternative operating scenarios to inform options for expanding capacity; and
- Describes potential planning and delivery of Sounder South capacity improvements.

Ridership forecasts for Sounder South predict ridership to continuously evolve over the next 25 years, while maintaining a consistent upward growth trajectory. Ridership forecasts anticipates temporary adjustments at times as the Link light rail system extends southward and commuters begin to use all transit modes available in the corridor. Underlying regional growth in population and employment will likely ensure the cities in the corridor continue growing, resulting in overall

growth in transit system ridership, and bringing new riders to Sounder. Sounder South ridership is also projected to increase enough in the next few years to consistently exhaust seated capacity on most trips in the current system.

Sound Transit plans to use two strategies to meet these challenges: longer trains and more trips. Strategy One calls for longer trains, focuses on making investments in fixed assets, including station platforms and additional fleet, to increase baseline Sounder South system capacity by expanding from 7-car trains today incrementally up to 10-car trains in the future. These are investments Sound Transit can begin implementing right away and deliver over the next several years with reasonable cost and schedule risks. Strategy Two focuses on adding more Sounder South trips. Sound Transit plans to work with BNSF and other partners in the corridor to plan service increases for implementation as needed to promote and accommodate future ridership. This strategy requires Sound Transit to reach agreements with BNSF on two program elements: capital improvements to increase capacity within the corridor to increase the number of Sounder South trips without adversely affecting freight operations, and access to the BNSF-owned tracks. This could include adding one or more trips before capital improvements to increase capacity are completed.

The SDIP is a system plan intended to communicate Sounder expansion priorities at a programmatic level for the use of resources identified in the ST3 Plan, and provide guidance for future decisions. Sound Transit could implement the strategies and priorities identified in this plan through project-level planning, preliminary design, and environmental documentation work. Decisions on specific investments would be subject to those processes and are described in greater detail in Section 4 of this plan.

2 BACKGROUND AND TECHNICAL ANALYSIS INFORMATION

Sound Transit based the SDIP on a foundation of studies that analyzed the history and current performance of Sounder South, new operational scenarios to enhance the service, current and potential ridership in the corridor, and station improvements related to expanding service capacity. These analyses are documented in supplemental technical memoranda and summarized below.

2.1 Overview: Sounder South – Past and Present

Voter approval of the Sound Move ballot measure in 1996 initially established Sounder South Commuter Rail service. Sound Move provided nine weekday round trips between Seattle and Pierce County. The Sound Transit 2 (ST2) Plan, approved by voters in 2008, added four additional round trips. Sound Transit partnered with BNSF and the cities in the corridor to build station facilities and upgrade railroad tracks and signals to increase weekday train trips incrementally over time.

Sounder South service began in 2000 with two daily round trips (four total trips) between Tacoma and Seattle. Since then, the service has grown successfully and now provides 13 daily round trips (26 trips total), and ridership has grown steadily along with the expanded service. Sounder South has progressed from providing a commute alternative to a few hundred daily riders in 2000 to being the first commute option to over 16,000 daily riders in 2018.

Sounder South operates mostly during the morning and afternoon peak commute times following the peak commuter pattern. In the morning, most trains run north toward Seattle, and during the afternoon, most trains run south toward Tacoma Dome and Lakewood stations. Train trips run every 20 minutes during the busiest times when demand is highest, a period known as the “peak hour”. The periods before and after the peak hour are referred to as the “shoulders” of the commute. Train trips on the shoulders of the peak hour are less frequent as ridership demand decreases from the morning and afternoon peak. In addition to the peak-direction trips, Sounder South also provides some trips in the reverse directions, southbound in the morning, and northbound in the afternoon. In addition to serving non-peak riders, these trips also allow Sound Transit to re-position trains for trips in the peak direction. Sounder South trains are comprised of a diesel-electric locomotive and seven, double-decker passenger cars.

The ST3 Plan approved by voters in 2016 builds on the progress of Sounder South by providing a capital improvements program to expand capacity and further enhance its ability to serve customers. The strategy for future expansion of Sounder South begins with recognizing key features of the service today. The Sounder South Comprehensive Operations Assessment (COA) documents these features, including a detailed examination of Sounder South’s existing service conditions. Together, the features listed in this section provide a foundation for Sounder South’s future growth.

2.2 Key Features – Sounder South today

Stations: Sounder South trains operating in both directions serve the following stations: Lakewood, South Tacoma, Tacoma Dome, Puyallup, Sumner, Auburn, Kent, Tukwila, and Seattle. King Street Station in Seattle serves as the northern terminal for Sounder South. With the exception of King Street and Tacoma Dome Stations, Sound Transit owns all the station facilities. In the future, Sound Transit plans for Sounder South to serve new stations in Tillicum and DuPont. Figure 2-1 shows each station location within the corridor. The stations in Seattle and Tacoma are located in urban settings. The other stations are located in community downtowns surrounded largely by variable density. Except where noted, the stations include the following common features:

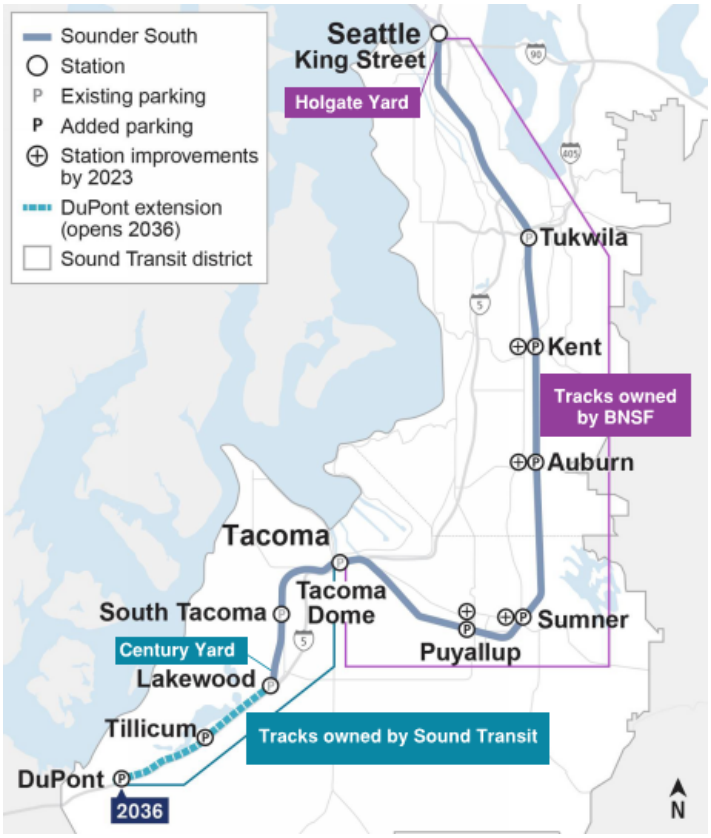


Figure 2-1 Sounder South Corridor Map

- Seven-car train platforms for passenger access to trains, with lighting, signage, landscaping, ticket vending machines, and shelters.
- Vehicular parking (except at King Street Station) in close proximity to platforms. Sound Transit is in the process of expanding parking facilities in Kent, Auburn, Sumner, and Puyallup. New stations planned for Tillicum and DuPont would include parking. Today there over 6,200 transit-managed parking stalls among the eight Sounder stations south of Seattle.
- Transit facilities, such as bus stops, bus loops, and bus layover space to facilitate transfers between trains and buses.
- Sidewalks, pathways, and/or other pedestrian facilities to provide safe and convenient access to the trains for passengers.
- Bicycle storage, including bike racks, individual bike lockers, and secure bike storage areas. Configurations and availability vary by location.

Passengers access the stations by a variety of means, including driving, drop-offs, bus and light-rail transfers, walking, and biking. Use of these modes varies at each station and depends on residential density, local and regional bus schedules, bicycle and pedestrian connections, parking volume, and pick-up/drop-off space around stations.

Fleet: Sound Transit owns the Sounder fleet. Sounder South uses diesel-electric locomotives, double-decker passenger coaches, and double-decker cab cars for each train. Table 2-1 shows existing fleet composition. The current in-service fleet includes 81 total vehicles, made up of 14 locomotives, 40 passenger coaches, and 27 cab cars. Weekday Sounder South service requires a minimum of 56 vehicles, including 7 locomotives, 7 cab cars, and 42 coaches. The remaining vehicles serve the Sounder North corridor, provide a reserve train to back up daily service, and a spare ratio to ensure proper maintenance intervals. Table 2-2 shows weekday fleet allocation.

Table 2-1 Existing Fleet Composition

Equipment Type	Vehicle Number	Manufacturer	Beginning of Service Year	Available Fleet	Total Fleet
Locomotive	901-911	GM	2000-2001	11	14
Locomotive	921-923	Motive Power	2012	3	
Cab car	101-111 301-307	Bombardier	2000-2003	18	27
Cab car	321-329	Bombardier	2017	9	
Coach	201-240 401-410	Bombardier	2000-2003	40	40

Cab cars allow Sounder trains to reverse direction to complete a round trip efficiently. Rather than turning the train around, the operator moves to the cab car at the opposite end from the locomotive, where they can control the train. Cab cars also include passenger seating.

In general, all passenger coaches and cab cars include the following passenger amenities:

- two main levels of seating
- luggage racks
- restrooms
- work tables
- power outlets
- free Wi-Fi
- wheelchair spaces
- bicycle spaces

Sound Transit stations provide access for passengers with mobility impairments with a taller section of platform, called a mini-high platform, positioned to access the second car when a bridge plate is placed by the on-board conductor. Each coach can seat about 146 passengers, depending on the configuration. Cab cars can accommodate 130-140 passengers, with new cab cars having lifts for passenger with mobility impairments that are not regularly called upon. Overall, each 7-car train serving Sounder South has room for nearly 1000-seated passengers.

Table 2-2 Weekday Fleet Allocation

Equipment Type	Amount	North Service	South Service	Reserve Train	Spares	Spare Ratio (%)
Locomotive	14	4	7	1	2	16.7%
Cab car/Coach	67	10	49	3	5	8%
Total	**81**	**14**	**56**	**4**	**7**	**9.5%**

Operations: Key operational features of Sounder South include delivery of service and maintenance, the right-of-way through which trains travel, the schedule for train operations, and travel time. Today Sounder South's operational characteristics are generally as follows:

- Right-of-Way (ROW): Sounder South operates over a 48-mile corridor stretching from Lakewood in Pierce County to King Street Station in Seattle. Sound Transit owns and maintains the portion of track from Tacoma south. Just north of Tacoma Dome Station, the ownership changes at the junction with the BNSF main line, named TR Junction. Sounder South operates on the BNSF-owned main line between that junction and Seattle. Figure 2-1 shows track ownership within the corridor. Sound Transit has established agreements with BNSF to secure access to the tracks for Sounder South train trips during commute hours, and to upgrade the track and signal facilities in the corridor to accommodate freight service, passenger service, and track maintenance. Similarly, Sound Transit has invested in upgrades to its own track and signal facilities to support passenger services. Outside of Sounder South's peak period, freight trains use the BNSF tracks heavily and BNSF staff also perform scheduled inspections and maintenance, which can cause congestion.
- Service & Maintenance Delivery: Sound Transit contracts with specialized providers to deliver Sounder service. BNSF operates all Sounder services under a contract with Sound Transit, including Sounder South. BNSF provides train crews and dispatch services. Train crews include one engineer to operate each train and one conductor per train to serve customers and support the engineer. In addition, Amtrak maintains the Sounder fleet and provides mid-day storage under contract to Sound Transit. Finally, Sound Transit contracts independently for security, fare collection, and maintenance of station facilities.
- Schedule: Sounder South operates each weekday during the afternoon and morning commute periods. Figure 2-2 shows the current full weekday schedule. During the afternoon, 10 train trips operate southbound from Seattle beginning at 2:35 pm, with the last departure at 6:30 pm. Seven of these trips continue to Lakewood, while three terminate at Tacoma Dome Station. In addition, three trips operate northbound toward Seattle in the afternoon. In the mornings, 10 trips operate in the northbound direction. Eight of these trips originate in Lakewood beginning at 4:36 am. Two trips originate at Tacoma Dome Station at the peak hour of the commute. The final morning departure from Lakewood is 10:16 am. In addition, three trips operate southbound from Seattle in the morning to position equipment for northbound trips. There is no regularly scheduled weekend service. However, Sound Transit provides special service to serve sports and other events in the corridor; these services are determined on a case-by-case basis.

Lakewood to Seattle (northbound)

Train	Lakewood Station	S. Tacoma Station	Tacoma Dome	Puyallup Station	Sumner Station	Auburn Station	Kent Station	Tukwila Station	Seattle
1500	4:36AM	4:41	4:50	5:03	5:08	5:18	5:25	5:32	5:52
1502	5:01	5:06	5:15	5:28	5:33	5:43	5:50	5:57	6:17
1504	5:26	5:31	5:40	5:53	5:58	6:08	6:15	6:22	6:42
1506	5:46	5:51	6:00	6:13	6:18	6:28	6:35	6:42	7:02
1508	6:06	6:11	6:20	6:33	6:38	6:48	6:55	7:02	7:22
1510	6:26	6:31	6:40	6:53	6:58	7:08	7:15	7:22	7:42
1512	6:46	6:51	7:00	7:13	7:18	7:28	7:35	7:42	8:05
1514	:	:	7:20	7:33	7:38	7:48	7:55	8:02	8:22
1516	:	:	7:50	8:03	8:08	8:18	8:25	8:32	8:52
1518	10:16	10:21	10:30	10:43	10:48	10:58	11:05	11:12	11:32
1520	**:**	**:**	**4:06PM**	**4:18**	**4:23**	**4:33**	**4:40**	**4:47**	**5:07**
1522	**:**	**:**	**4:30**	**4:42**	**4:47**	**4:57**	**5:04**	**5:11**	**5:31**
1524	**:**	**:**	**5:15**	**5:27**	**5:32**	**5:42**	**5:49**	**5:56**	**6:16**

Seattle to Lakewood (southbound)

Train	Seattle	Tukwila Station	Kent Station	Auburn Station	Sumner Station	Puyallup Station	Tacoma Dome	S. Tacoma Station	Lakewood Station
1501	6:05AM	6:18	6:25	6:32	6:42	6:47	7:06	:	:
1503	6:35	6:48	6:55	7:02	7:12	7:17	7:36	:	:
1505	7:55	8:08	8:15	8:22	8:32	8:37	8:52	9:01	9:11
1507	**2:35PM**	**2:48**	**2:55**	**3:02**	**3:12**	**3:17**	**3:37**	**:**	**:**
1509	**3:15**	**3:28**	**3:35**	**3:42**	**3:52**	**3:57**	**4:17**	**:**	**:**
1511	**3:35**	**3:48**	**3:55**	**4:02**	**4:12**	**4:17**	**4:30**	**4:39**	**4:51**
1513	**3:55**	**4:08**	**4:15**	**4:22**	**4:32**	**4:37**	**4:57**	**:**	**:**
1515	**4:15**	**4:28**	**4:35**	**4:42**	**4:52**	**4:57**	**5:10**	**5:19**	**5:31**
1517	**4:35**	**4:48**	**4:55**	**5:02**	**5:12**	**5:17**	**5:30**	**5:39**	**5:51**
1519	**4:55**	**5:08**	**5:15**	**5:22**	**5:32**	**5:37**	**5:50**	**5:59**	**6:11**
1521	**5:20**	**5:33**	**5:40**	**5:47**	**5:57**	**6:02**	**6:15**	**6:24**	**6:36**
1523	**5:45**	**5:58**	**6:05**	**6:12**	**6:22**	**6:27**	**6:40**	**6:49**	**7:01**
1525	**6:30**	**6:43**	**6:50**	**6:57**	**7:07**	**7:12**	**7:25**	**7:34**	**7:46**

Figure 2-2 Sounder South Schedule (Timetable) - 2019

- Travel time: Sounder South trains operate up to 79 miles per hour. Travel time between Lakewood and Seattle with eight station stops is 76 minutes. Travel time between Tacoma Dome and Seattle with six station stops is 62 minutes.

Ridership. Sounder South has experienced consistent ridership growth since opening in 2000 as a result of service expansion, capacity improvements, population and economic growth, and increasing road congestion as shown in Figure 2-3. Notably, ridership increased by 15 percent per year between 2015 and 2017, a period that corresponds to an improving economy and the opening of University of Washington Link Extension.

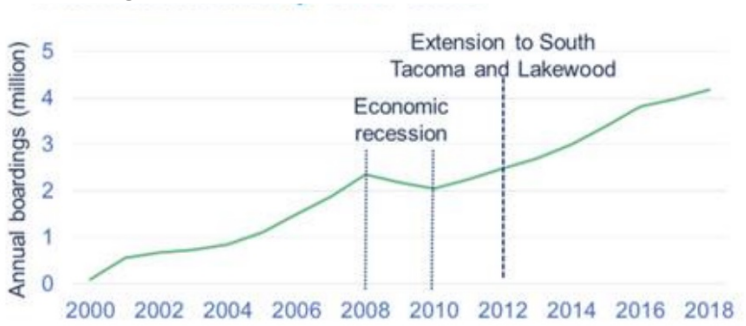


Figure 2-3 Annual Sounder South Boardings - 2000-2018

Today, Sounder South averages over 16,000 daily riders, and more than four million per year. Ridership is highest southbound in the afternoons and northbound in the mornings. Trips in the opposite directions at rush hour carry comparatively fewer riders, reflecting the broader commute pattern overall. Figures 2-4 and 2-5 demonstrate this pattern by showing the average weekday usage of each train in 2018. Sound Transit's performance standards for passenger comfort for Sounder is to provide a seat for every passenger who is on board for longer than 30 minutes. The figures also show some Sounder South trips at or near the passenger comfort standard, an indication additional capacity may be needed to support continued ridership growth.

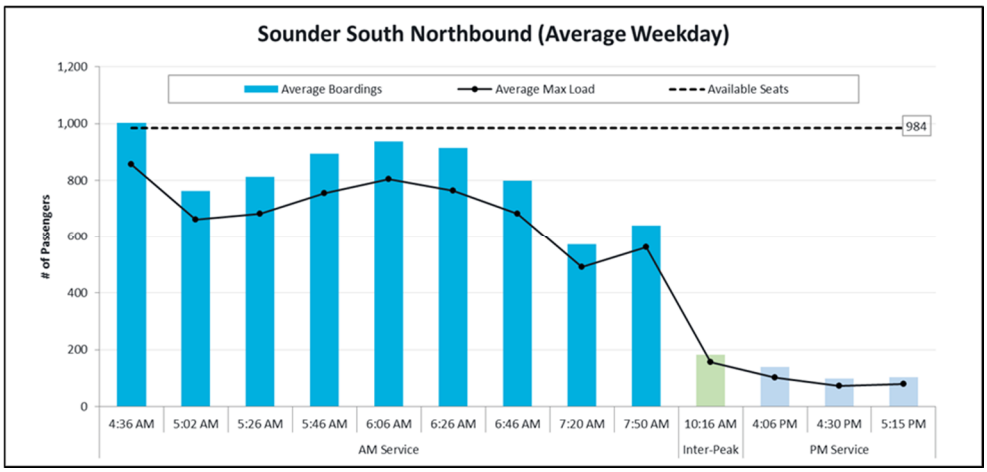


Figure 2-4 Average Weekday Boardings and Max Load (Northbound, 2018)

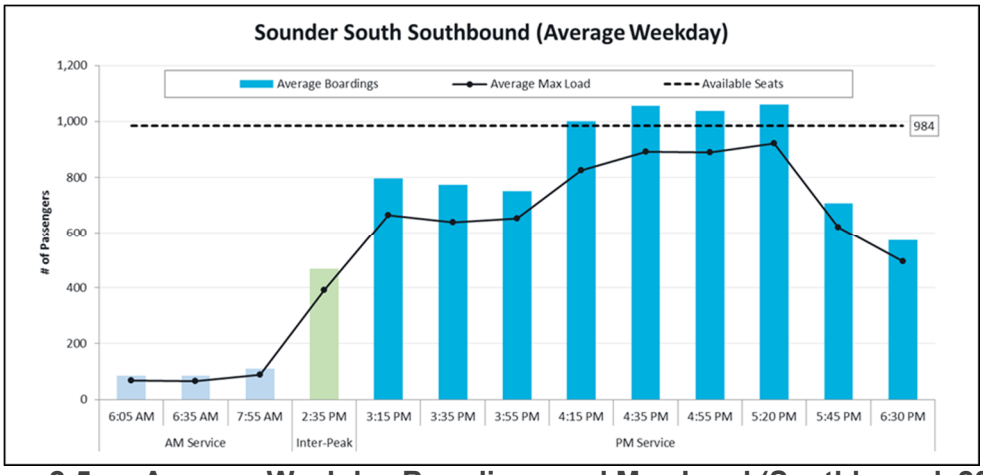


Figure 2-5 Average Weekday Boardings and Max Load (Southbound, 2018)

2.3 Ridership Growth

The ST3 Plan responds to continued regional population and employment growth as forecasted in the Puget Sound Regional Council (PSRC) Vision 2040 plan. The forecasted growth includes the communities served by Sounder South. The ST3 Plan projected Sounder South ridership would continue to grow as a result. To inform the Sounder South SDIP, Sound Transit refreshed ridership projections in the corridor.

Sound Transit based the ridership analysis on its established modeling techniques, using PSRC's 2040 growth projections. Sound Transit based its assessment of future Sounder South demand on the afternoon commute, which represents the period of highest daily ridership. Using 2042 as the year when the entire ST3 system would be in operation, the results show Sounder South ridership will likely continue to grow steadily assuming the existing train schedules. Sound Transit expects annual ridership on Sounder South trains could reach nearly 6 million in 2042, as shown in Table 2-3.

Table 2-3 Sounder South Annual Ridership Projection

2018 Annual Riders	2042 Annual Riders
4.18 Million	**5.95 Million**

Ridership forecasts anticipate temporary adjustments downward over this period twice, once in 2024 when Federal Way Link Extension opens, and again in 2030 when Tacoma Dome Link Extension opens. These adjustments result from some current users of the Auburn and Tacoma Dome Sounder stations, respectively, likely opting to use Link light rail. In addition, ridership will likely increase in 2036, when the Sounder South extension to Tillicum and DuPont opens. Figure 2-6 shows the expected trend in Sounder rider load during the afternoon peak hour, when the service sees heaviest demand.

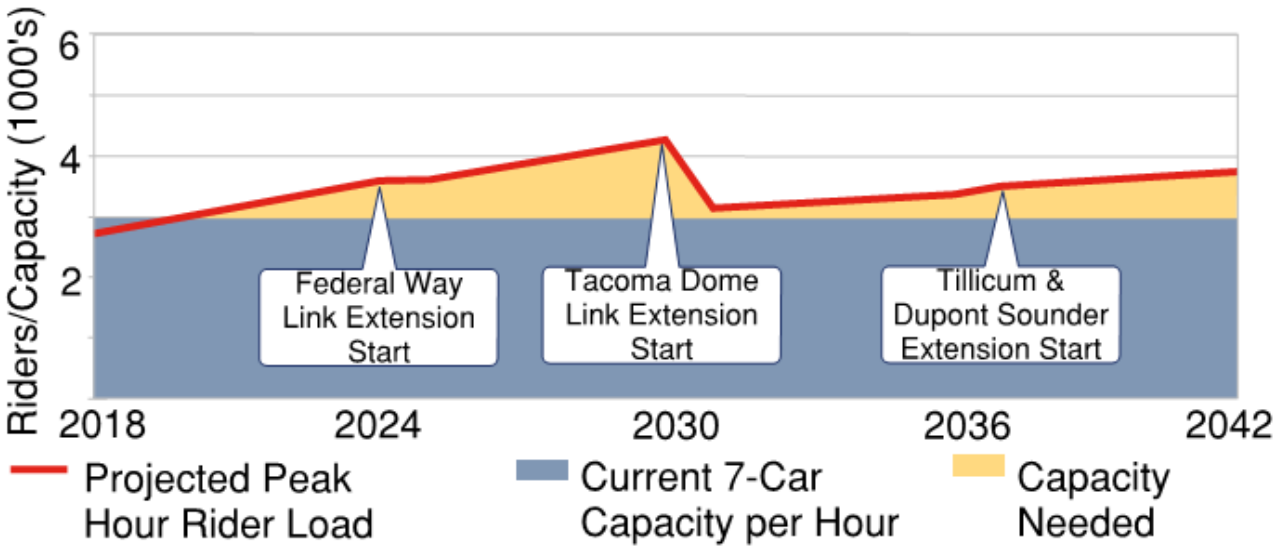


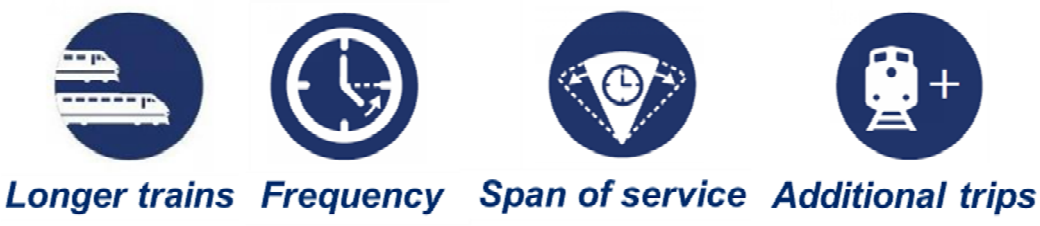
Figure 2-6 Sounder South PM Peak Hour Ridership Projections and Existing Capacity

The ridership forecast indicates travel demand could exceed existing Sounder South seated capacity standard within the next few years. More capacity would be needed to ensure Sound Transit meets its passenger comfort standard and provide room for riders to use the service.

Sounder South ridership has also increased in response to increases in service. Historic ridership data illustrate that adding trips has resulted in more riders using the service. This pattern can be expected to continue in the future; service increases are likely to generate higher ridership than indicated by the base forecast.

2.4 Options for Expanding Sounder South

Sounder South operates today with seven car trains during a fixed rush hour schedule. Four primary factors present opportunities to expand capacity in responses to forecasted ridership growth. These include:



- **Train length:** Sound Transit operates seven car trains on all Sounder South trips today. The ST3 Plan calls for operating trains up to 10 cars long. Sounder South capacity could be increased incrementally by operating trains consisting of eight, nine, and/or ten cars.
- **Trip frequency:** Today, Sound Transit provides train trips every 20 minutes during the busiest commuter period. The service tapers on either side of the peak commute periods, with less frequent service earlier and later during the morning and afternoon rush hours. Increasing trip frequency by operating trains every 15 minutes could provide more seated capacity during the peak hour of each commute period
- **Span of service:** Sound Transit's window for operating Sounder South today is generally limited to the existing peak commute periods under its agreements with BNSF. Broadening the period during which Sounder South operates to provide more trips later in the morning, earlier in the afternoon, and/or later in the evening would provide more capacity than exists today.
- **Number of trips:** Today, Sound Transit operates nine round trips in the peak direction during the peak periods, as well as three reverse round trips during the peak periods and one off-peak round trip (See Figure 2-2). Adding additional round trips to the existing schedule would provide more overall capacity to the system.

Sound Transit considered these factors in various scenarios to understand options for expanding Sounder South capacity and to determine an appropriate program of investments to meet future demand in the corridor. The scenario development and analysis used a two-step process: first by defining a broad set of concepts to encompass all possible combinations of the capacity expansion factors; and second, using a model to simulate operations for each scenario. The simulation results established a basis for understanding how each scenario might perform in terms of reliability, cost, and ridership.

The existing Sounder South level of service established the baseline for evaluating scenarios. In addition to the baseline, Sound Transit examined four additional scenarios for expanding capacity. All scenarios assumed 10-car trains. There are two reasons for this. First, the simulation model does not distinguish between train lengths. Second, the scenarios showed maximum potential capacity to differentiate between scenarios for the purpose of comparison. A brief description of each follows:

- **Scenario A: 9 peak-period round trips with 10 cars every 15 minutes**
  This scenario tested 15-minute headways to simulate more trips during the busiest commute period to provide additional capacity only during the peak hour. It also provided an understanding of how more frequent service might affect Amtrak and BNSF freight services in the corridor.
- **Scenario B: 11 peak-period round trips with 10 cars every 15 minutes**
  This scenario added two trips in the peak periods within the existing span of service to show how more frequent trips might provide additional capacity throughout the entire commute period. It also provided an understanding of how more frequent service might affect Amtrak and BNSF freight services in the corridor.
- **Scenario C: 11 peak-period round trips with 10 cars every 20 minutes**
  This scenario added two trips in the peak periods, uses 20-minute headways, and extends the commute period beyond today's schedule by adding one trip 30 minutes later in the morning and another 30 minutes earlier in the afternoon. It showed how trips every 20 minutes over a longer period might augment system capacity. It also provided an understanding of how extending hours of service might affect Amtrak and BNSF freight services in the corridor.
- **Scenario D: 11 peak-period round trips with 10 cars every 15 minutes, plus evening service**
  This scenario added three more round trips, two within the existing commute periods and one in both directions during mid-evening. Testing this scenario demonstrated how 15-minute headways might provide additional capacity at the busiest time. It also provided an understanding of how more frequent and additional later evening service might affect Amtrak and BNSF freight services in the corridor.

Sound Transit developed these scenarios while considering the likely financial impacts and ridership gain. The ridership gain of adding hourly service during the middle of the day appeared low compared to the anticipated costs for track and signal infrastructure. It is possible that the costs of the required improvements to support added capacity for passenger trains during the mid-day or evening could exceed the ST3 approved Sounder capacity expansion program budget for Sounder South.

Table 2-4 shows the results for each scenario simulation and provides a high-level view of the results with more detailed descriptions of the methods and results following the table.

Simulation Model: For consistency, Sound Transit used a Rail Traffic Controller (RTC) model to simulate rail operations and evaluate scenarios, the same model BNSF uses to analyze system capacity. RTC expresses output as minutes of delay per 10 miles compared to the baseline.

The model compared the scenarios to the baseline 2042 No-Action scenario that assumes no changes to the current rail infrastructure or the number of passenger trips. The Rail Traffic Controller (RTC) model used an estimated number of additional freight trains in 2042 based on an assumed freight tonnage increase of two percent annually, which is a rate typically accepted by the Federal Railroad Administration (FRA). This baseline simulation showed that the rail network in the study area would continue to operate reliably into 2042 without any infrastructure improvements.

Table 2-4 presents separately the changes in the delays to Sounder, Amtrak, and freight trains for each scenario. It also presents the changes in delay to freight trains in two ways, average minutes of delay over 10 miles, and number of trains delayed for more than 30 minutes. Decreases in delay are in shaded grey cells in the table, while increases in delay are in red bold text.

Table 2-4 Train Operation Simulation Delay Results

Scenario	Scenario Description#	Freight Delay*	Amtrak Delay	Sounder Delay	Freight Delay**
Baseline		36	1.5	1.1	11.8
A	15 minute frequency with nine round trips	34.1	**2.4**	**2.0**	7.9
B	15 minute frequency with 11 round trips	**42.5**	**3.6**	0.5	**14.3**
C	20 minute frequency with 11 round trips and extended hours	28.8	**2.4**	0.7	5.4
D	15 minute frequency with 11 round trips plus evening	32.5	**1.9**	0.9	6.3

*Delay expressed as minutes per 10 miles;
**Delay expressed as trains per 30 minutes;
#All trips are in the peak period and peak direction except as noted

The freight delay metric of average delay over 10 miles is measured over a discrete segment of track for each freight train trip. This provides an understanding of track and signal improvements needed within particular areas to reduce delay in the system. The number of freight train trips delayed for more than 30 minutes expresses the overall resiliency and fluidity of the general rail network within the entire study area.

Table 2.4 shows that, when measured against the baseline, Scenario A, with only minor track and signal improvements, decreases the minutes of freight delay and the number of freight trains delayed longer than 30 minutes, but it also increases minutes of delay for Amtrak and Sounder trains. Scenario B, with a modest level of track and signal improvements, increases both delay metrics for freight trains and increases the delay minutes for Amtrak, while improving the delay to Sounder trains. Scenario C, with the same modest level of track and signal improvements, increases the delay minutes for Amtrak, but decreases the delay to Sounder trains and decreases both delay metrics for freight trains. Similarly, Scenario D increases the delay minutes for Amtrak, decreases the delay to Sounder trains, and decreases both delay metrics for freight trains. However, Scenario D also included significantly more track and signal improvements than the other scenarios.

2.5 Key Findings

This section summarizes the key findings derived from the technical analyses.

- Updated ridership trends on Sounder South are consistent with previous estimates, with the strongest ridership in the morning and afternoon peak periods. Further, ridership can be expected to continue to increase over time.
- Without increasing Sounder South capacity, projected demand will likely eclipse existing seated capacity during the peak period within the next few years. This could result in trains operating regularly with standing riders, which would not meet Sound Transit's current performance standards.
- There is a connection between Sounder and Link ridership. When light rail projects extend Link to Federal Way in 2024 and Tacoma Dome in 2030, some riders will likely choose to ride Link's more frequent service. This would temporarily slow or reduce demand on Sounder South trains. However, Sounder ridership will likely recover over time.
- Sounder South trips at 15-minute headways could pose additional risk to on-time reliability. Today, with 20-min peak headways, longer delays to a Sounder South train may delay other trains behind it, however more frequent 15-minute headways are more likely to result in any short delay having a cascading effect, delaying multiple train trips. At a minimum, it would reduce the margin for error in operating trains between stations and moving them in and out of the King Street terminal.
- In general, the RTC simulation analysis suggests a program of capital improvements can be tailored to support growth in Sounder South ridership into 2042 by instituting longer trains, more frequent trips, expanded service hours, and/or additional trips. Such a program should be possible to implement without compromising overall system performance for freight, passenger, and commuter services. These factors can be organized into two categories of improvements: fixed-capacity improvements and flexible capacity improvements.
- Sound Transit considered adding later evening trips and more mid-day trips outside the 3.5-hour two commute periods. These concepts would conflict with heavier BNSF freight train operations when their tracks are most congested. BNSF has indicated to Sound Transit that it would not support evening service without substantial additional investment. As a result, Sound Transit would need to make even more track and signal improvements on BNSF's corridor than is needed to increase capacity during Sounder's morning and afternoon peak periods. The cost of the capacity improvements for these trips may exceed rider benefit.
- The variables affecting schedule enhancements, more frequent trips, extended hours, and additional round trips, fall only partially within Sound Transit's control. Additional trips and service hours are subject to approval by BNSF, which means they must be carefully and deliberately planned along with a corresponding program of track and signal capital improvements to the rail infrastructure. These improvements are referred to in this plan as "flexible" capacity, because they can be pursued in various combinations and can be tailored to meet ridership growth, subject to negotiations with BNSF.

- In comparison, the ability to extend trains lengths to 10 cars is more within Sound Transit's control. Longer trains can be implemented through a program of extending station platforms, acquiring additional fleet, and providing more maintenance and storage capacity, while continuing to operate within the existing schedules. These improvements are characterized in this plan as "fixed" capacity, because they are based on durable assets that are substantially within Sound Transit's authority to plan, deliver, acquire, own, operate, and maintain.
- All scenarios using 10-car trains provide the ability to meet the baseline ridership forecast within the forecast horizon. All scenarios testing additional service produce a ridership increase above the baseline forecast as a result of additional capacity during peak commute hours.
- King Street Station's narrow platform and limited egress points, coupled with it being the originating and ending station for all Sounder service, makes it a critical pinch point for both adding trips and operating longer trains. King Street Station will likely need further study during project-level alternatives analysis to ensure it can provide sufficient capacity to accommodate increased passenger use.

2.6 Past Planning Process and Environmental Reviews

In 1996, Sound Transit adopted its Regional Transit Long-Range Vision (later updated in 2005 as the Long-Range Plan) and the Ten-Year Regional Transit System Plan (Sound Move). Sound Move was the first phase of investments for implementing the Long-Range Vision, and included commuter rail service and stations between Everett and Lakewood. For SEPA compliance, Sound Transit completed a Regional Transit System Plan Final Environmental Impact Statement (FEIS) in 1993 and a Final Supplemental Environmental Impact Statement (SEIS) on the Regional Transit Long-Range Plan in 2005. The current regional transit system in the south Puget Sound area includes Sounder South commuter rail between King Street Station in downtown Seattle and Lakewood. In 2008, Sound Transit adopted the second phase of Long-Range Plan investments, the ST2 System Plan (ST2). This plan included expanded Sounder service between Seattle and Lakewood, and access improvements at South Tacoma and Lakewood stations, among others.

The most recent SEPA environmental document on the Long-Range Plan is the 2014 Final Supplemental Environmental Impact Statement (Final SEIS) for the Regional Transit Long-Range Plan Update. The 2014 Final SEIS supplemented and built upon the 1993 FEIS and the 2005 Final SEIS. Voters approved the third phase of investments (ST3) for implementing the Long-Range Plan in 2016 which includes the Sounder South Capacity Improvements Program and the Sounder DuPont Extension. While projects have been evaluated under SEPA at the planning-level, additional project-level environmental reviews that comply with SEPA and NEPA will be conducted as individual projects are implemented.

3 PUBLIC ENGAGEMENT

3.1 Public Engagement Overview

Sound Transit has engaged with communities along the Sounder South corridor and the general public in a variety of ways since March 2019 to inform the SDIP, including:

- Convening a Corridor Leadership Forum of Sound Transit Board members, local elected officials, and port representatives.
- Convening Interagency and Railroad Working Groups made up of technical and administrative staff from cities, transit agencies, Washington State Department of Transportation, Puget Sound Regional Council, and railroad operation groups in the corridor.
- Conducting broad public engagement, including focus groups, online surveys and pop-up events at stations.

Sound Transit conducted two major rounds of broad public outreach, as shown in Figure 3-1, below. During the second round of outreach in January 2020, Sound Transit shared and sought public input on the draft SDIP. Both rounds of outreach are detailed further below.

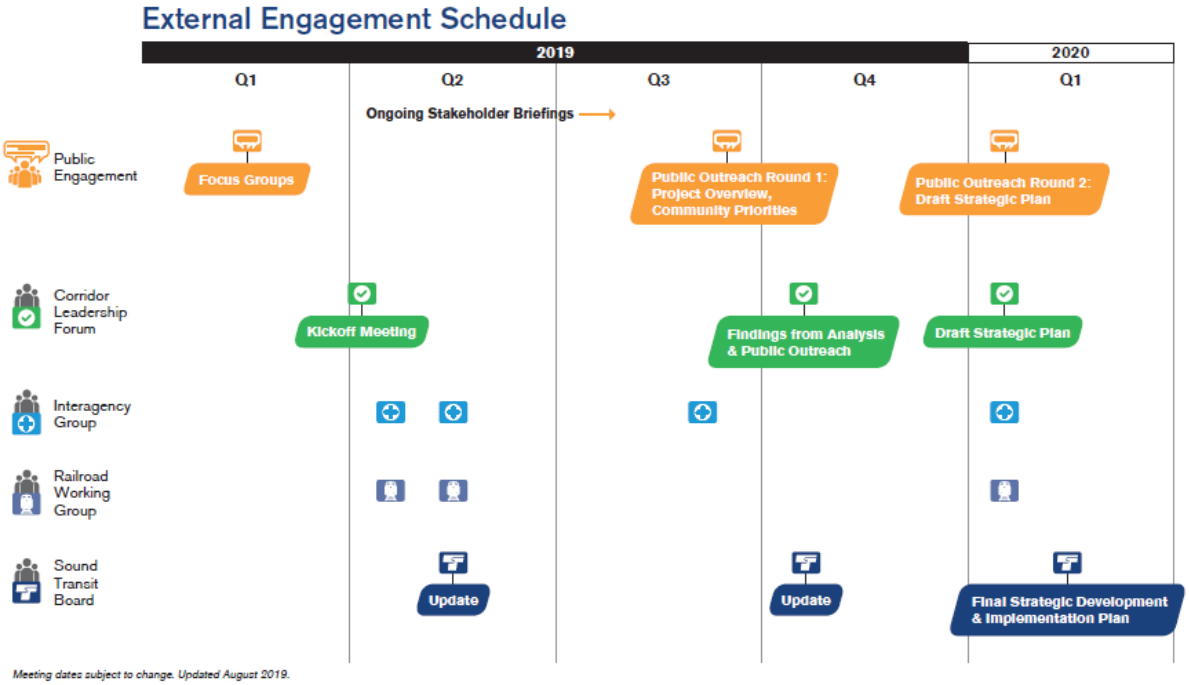


Figure 3-1 SDIP External Engagement Schedule

3.2 Fall 2019 Public Feedback Summary

In September 2019, Sound Transit hosted an online open house and 11 drop-in sessions in communities served by Sounder South to share initial analysis on possible Sounder South improvements, information on system constraints and trade-offs and gather community feedback on priorities.

Overall, more than 4,100 people participated in September 2019, resulting in more than 2,500 responses to the online survey. The survey and events were publicized through a mailing to more than 22,000 residents and businesses, promotion on social media, posters and signs at the stations, and other methods.

Visitors to the online open house and drop-in sessions were asked for feedback about their priorities for expanding Sounder South capacity and what changes could make riding Sounder a better option for them. Approximately 75% of respondents were current daily or weekly riders, and approximately 25% were infrequent riders or non-riders.

Common themes from the feedback are discussed in more detail and include:

1. Strong desire for consistent, on-time service.
2. Interest in adding more trips.
3. Support for longer trains to serve more riders.
4. Requests for improved circulation and amenities at stations.

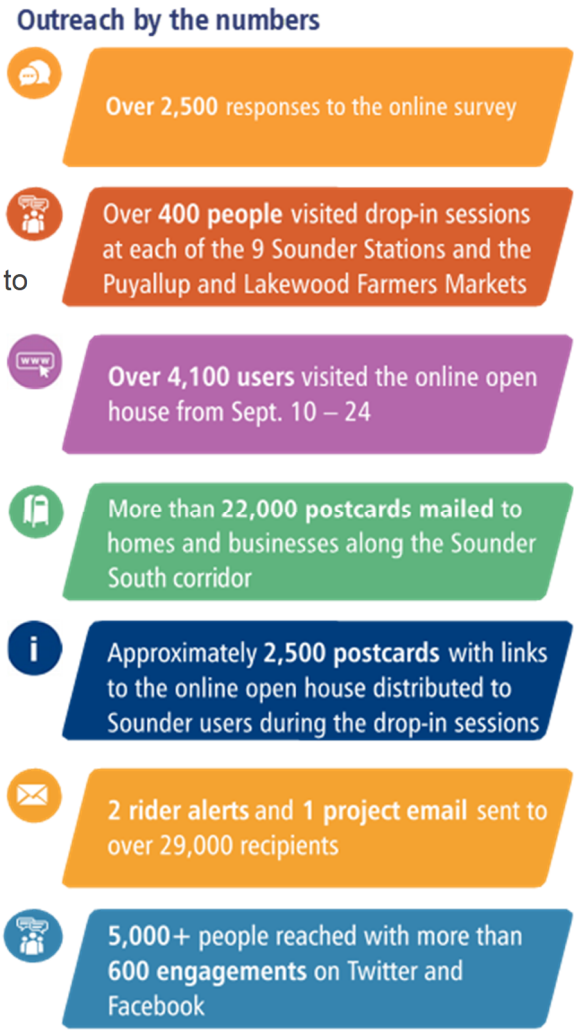


Figure 3-2 Fall 2019 Outreach Statistics

3.2.1 Strong desire for consistent, on-time service

Participants were asked to rank the importance of six service features. Overall, “consistent, on-time service” was the number one priority response by riders and non-riders alike. This was followed by “more frequent service during peak commute times”, which was generally prioritized higher by current riders than infrequent or non-riders.

These top two priorities from respondents have trade-offs: increasing the frequency of service by running trains every 15 minutes during peak periods, rather than every 20 minutes as done today, may lead to a decline in reliability and higher potential for service delays, due to train congestion on the tracks and other factors.

Figure 3-3 Photo of Drop-in Session

Close together in third and fourth place were “more choices for when to ride: a later evening train,” and “getting a seat on the train.” In fifth and sixth place were “more choices for when to ride: an earlier afternoon train,” and “more choices for when to ride: a later morning train.” More choices for when to ride were of greater importance to infrequent and non-riders.

“Ensuring trains arrive on time and manage delays better. I understand they may be out of control due to freight or medical emergencies, but issues like train maintenance also on top can be frustrating for riders.”

Figure 3-4 On-time Service Quote

3.2.2 Interest in Adding More Trips

Survey respondents were interested in more daily Sounder trips. In an open-ended question (“Do you have comments about Sound Transit potentially running 1-3 more weekday trains?”), with over 1,600 responses, 91% of respondents reacted positively to Sound Transit potentially running more trains.

Additionally, in a question noting funding constraints, participants were asked what Sound Transit should prioritize when it comes to expanding Sounder South service: more choices for when to ride or ensuring there are enough seats to meet demand during peak travel times. More respondents preferred more choices for when to ride compared to enough seats during peak travel times.

- Non-riders showed a stronger preference for more choices for when to ride compared to enough seats.
- People of color and people with lower incomes (earning less than $60,000 annually) also showed a slightly stronger preference for more choices for when to ride.

“Greater service span is important to allow a greater variety of trips to be made by train and will also serve to increase peak ridership. If I know I can get home in the early afternoon to pick up a child from school, I may be more likely to ride at the peak morning commute.”

Figure 3-5 Increased Sounder Trips Quote

3.2.3 Support for Longer Trains to Serve More Riders

Respondents were also supportive of Sound Transit potentially running longer trains and extending platforms at the stations. In an open-ended question (“Do you have comments about Sound Transit potentially running longer trains at the Sounder stations? Consider longer platforms and more people.”), with over 1,100 responses, more than 70% reacted positively to Sound Transit potentially running longer trains.

Positive responses included comments about the need to alleviate crowding during peak periods, better accommodating riders with accessibility needs, eliminating people standing/sitting on the stairs when trains are crowded and better access for bicyclists. Of the negative responses, themes included concerns about how longer trains would impact crowding at King Street Station, preference for more service, and perceived high costs to lengthen trains

and extend platforms.

> ***"I think [running longer trains is] a great idea since the trains are often PACKED on my way home at 5:45."***

Figure 3-6 Longer Trains Quote

3.2.4 Requests for Improved Circulation and Amenities at Stations

Participants were asked to share what would improve their experience getting on and off the train, considering more riders and potentially longer trains in the future. Of the 1,200 people who provided comments, the top theme was requests for station amenities, such as additional ORCA card readers, more shelters, and more visible schedule information. In addition, a third of commenters asked for improved station circulation, such as wider platforms, additional platform access points, and more elevators, stairs or pedestrian bridges.

Participants who answered this question were able to note if their comment was station specific. King Street Station had the most comments, with respondents especially interested in improved station circulation and better connections to the International District / Chinatown Link station and other downtown destinations.

3.2.5 Other Feedback Themes

Other questions on the survey explored why people do or do not ride Sounder today, and what might make them more likely to ride. Survey respondents also had questions and comments about a variety of Sounder issues. The project website (www.soundtransit.org/sounder-capacity) provides the full Fall 2019 Outreach Summary, including a Frequently Asked Questions section with common questions and Sound Transit responses.

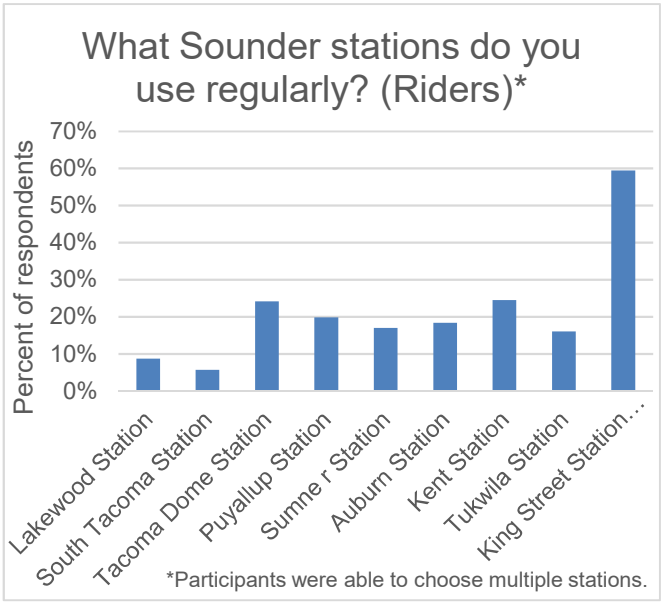


Figure 3-7 Most Utilized Stations

3.3 Respondent Characteristics

A goal of Sound Transit's fall 2019 outreach was to reach a variety of audiences, including current and potential riders and people who live or work near the Sounder South stations.

Approximately 75 percent of survey respondents were current weekly or daily riders. Sound Transit heard from at least 110 riders from each station. There was an average of 415 respondents per station (see Figure 3-7 for distribution).

In addition to current riders, Sound Transit collected more than 425 surveys from non-riders and infrequent riders.

In self-reported demographics, survey participants were predominantly white (76% white, 8% Asian/Pacific Islander, 5% mixed race, and 4% African American) and of relatively high income (44% more than $120,000 and only 15% less than $60,000). Compared to demographics for Sounder ridership, survey respondents were slightly less racially diverse than riders as a whole on Sounder and appear to have slightly higher incomes.

3.4 Winter 2020 Public Feedback Summary

Sound Transit hosted an online open house from January 23 – February 6, 2020, to seek public feedback on the Draft Strategic Development and Implementation Plan. Overall, more than 3,600 people visited the online open house, with more than 600 people completing the survey to share their feedback, including 10 responses in Spanish. In addition, Sound Transit received eight letters from cities and agencies along the project corridor regarding the draft plan.

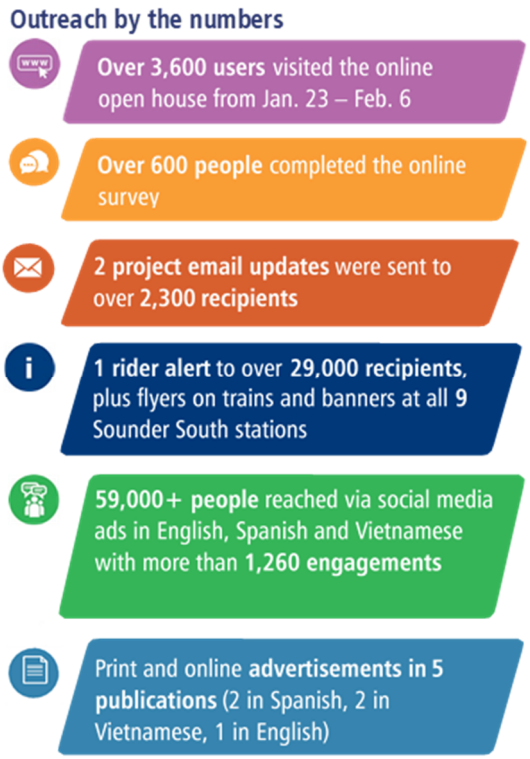


Figure 3-8 Winter 2020 Outreach Statistics

The online open house was publicized through posters and signs at the stations, social media, advertisements in regional online and print newspapers, and emails to the project newsletter and rider alert system. Project information was available in Spanish and Vietnamese, in addition to English.

The primary question on the survey asked, "What do you think about the draft Strategic Development and Implementation Plan? Please focus your comments on suggested changes or additions." Over 600 people responded. The two main strategies in the plan, longer trains and more trips, were referenced in roughly 36% and 58% of all comments, respectively. Over 75% of responses included support for one or both strategies, while approximately 18% included criticism of some kind. Key issues raised in critical comments included the need for additional parking, critique of project timelines and requests for greater focus on train reliability. See below for more detail on comments about the two primary strategies and other themes, along with some representative quotes.

"Both aspects of the plan (more trips and longer trains) are good and very much needed, especially as the population continues to grow. Longer trains would have a bigger benefit in the long term. Please also consider making more parking at the stations a priority."

"I like the idea of longer trains (more cars) and more frequent trips. I believe both are needed to accommodate the public needs...but these changes need to be enacted sooner rather than later."

Figure 3-9 Main Strategies Quotes

3.4.1 Strategy One: Longer Trains

Of the approximately 36% of comments that referenced longer trains, most stated support for the strategy, with several noting crowded platforms and the standing room only conditions on some trains today. Others voiced specific support for the optional interim 8-car strategy while longer platforms are built at each station. Some respondents voiced support for prioritizing more trips over longer trains. Reasons included:

- A belief that more trips would be easier, faster or less expensive to implement.
- Concerns that longer trains would trains would lead to more congested platforms, particularly at King Street Station

"Would like to see the addition of more train cars as the trains are very full and afternoon cars are often standing room only."

Figure 3-10 Longer Trains Quote

3.4.2 Strategy Two: More Trips

Of the approximately 58% of comments that referenced more weekday trips, most were in support and included suggestions for when the trips should be added. Though the draft plan indicates Sound Transit would seek to add new trips during the periods of highest demand, which are the peak morning and evening commute periods, evening service was the most frequently mentioned by commenters. (Due to track capacity and maintenance needs, BNSF has indicated they do not support an evening passenger trip on their tracks.) Also mentioned (in decreasing order) were midday, morning, weekends and peak commute periods, with a few mentions of reverse-commute trips. Several comments recognized the uncertainty of negotiating new trips with BNSF, which owns most of the tracks used by Sounder South.

"More trips would be great. At least one earlier in the morning and one later. The same for the afternoon. One earlier and one later. It would be nice to be able to head south earlier than 230"

"Adding an extra train after 6:30 pm can help people who work late evening."

Figure 3-11 More Trips Quotes

3.4.3 Other Topics

Other comment themes focused on suggested additions to the plan and other Sound Transit topics, including:

- **Parking** (mentioned by one in five people): There is a strong desire to increase parking capacity at Sounder South stations in conjunction with investments to expand train capacity.
- **Timeline for implementation:** Many respondents supported steps to expand capacity as soon as possible, especially during peak commute periods, or questioned how long it will take to implement the strategies of the plan.

- **Schedule reliability and delays:** Similar to feedback received during outreach in fall 2019, multiple participants emphasized the need for consistent, on-time service as part of any service expansion plan.
- **Station improvements:** Most commenters on this topic emphasized the need for platform and station circulation improvements at King Street Station. Others requested more station amenities, such as shelters and real-time arrival signage.
- **Transit connections to Sounder South stations:** Many participants commented on current bus or other transit options to connect to Sounder South stations. Additionally, there is a desire to better align other transit schedules with the Sounder South schedule.
- **Other Sound Transit projects**: A handful of comments provided feedback on other nearby Sound Transit projects, including station parking and access projects at Kent, Auburn, Puyallup and Sumner stations, the Federal Way and Tacoma Dome Link extensions, and the DuPont Sounder Extension. Comments ranged from hopes for faster timelines, requests for coordination between projects and reflections on ridership projections.

The full Winter 2020 Outreach Summary, including a Frequently Asked Questions section with responses from Sound Transit, is available on the project website: www.soundtransit.org/sounder-capacity.

3.4.4 Respondent Characteristics

The survey asked respondents how often they currently ride Sounder South and their zip code. Approximately 80% of the 600 survey respondents were current weekly or daily Sounder riders, while about 20% were from non-riders and infrequent riders.

The majority of respondents (58%) were from Pierce County, with an additional 36% from King County and 5% from Thurston County. There were respondents from all nine cities with Sounder South stations (including Seattle's King Street Station), with higher response rates (more than 10%) from cities with higher daily Sounder boardings, including Puyallup, Tacoma and Kent.

Ten responses (about 1.7%) were in Spanish. Five of the comments were generally supportive of the plan, while four requested more emphasis on additional trips, including evenings and weekends. No responses were received in Vietnamese.

3.5 Public Engagement Next Steps

Following presentation of the final SDIP to the Sound Transit Board, Sound Transit anticipates starting planning and implementation for individual projects identified in the SDIP on a rolling basis starting in 2020. Sound Transit plans to conduct additional public engagement to seek public feedback and provide appropriate environmental review opportunities on individual projects.

4 SOUNDER SOUTH SERVICE EXPANSION STRATEGY

The strategy for expanding service addresses both intermediate and long-term needs based upon the ridership projections, public feedback and financial trade-offs between operational and construction costs.

Sound Transit examined two ways to increase Sounder South capacity to meet demand. The first is investing in new fixed capacity to enable operation of longer trains with more seats during peak travel times. The second adds new flexible capacity by operating more trips and extending the hours of service. Fixed and flexible capacity improvements have distinct timelines, risks, and challenges.

Fixed Capacity Investments at a glance:

- Extended station platforms
- Additional coaches
- Improved access to longer trains
- Expanded storage and maintenance

Flexible Capacity Investments at a glance:

- Capital improvements to track and signals
- Additional coaches and locomotives
- Expanded service when needed
- Expanded storage and maintenance
- Subject to agreement with BNSF Railway

The Sounder South strategy for longer trains would invest in fixed capacity to accommodate 10-car trains. These investments include platform extensions, additional coaches, and storage tracks. This strategy also includes planning and implementing a program of strategic station access improvements to facilitate convenient passenger access to longer trains, or where access needs are greatest. When modifying existing or building new platforms, Sound Transit will address compliance with the Americans with Disabilities Act (ADA) to provide equal access for all customers. Sound Transit's approach to demonstrating continued commitment to ADA compliance is presented later in this Section.

Together, these improvements would provide sufficient capacity to serve Sounder South demand between now and 2030. Implementing these improvements would require approximately five to eight years. Therefore, Sound Transit may also consider adding flexible capacity to alleviate near-term crowding. The Sounder South strategy for adding more trips is a longer-term program of variable-capacity enhancements. Sound Transit plans to work with BNSF to determine the scope of the track and signal improvements to the BNSF and Sound Transit ROW needed to accommodate additional trips and extend hours of service. Sound Transit would determine when additional trips may begin service subject to updated ridership forecasting. This program would be subject to establishing an agreement with BNSF to specify how Sound Transit could deliver the identified improvements, the cost of those improvements, and secure access for additional Sounder South trains.

4.1 Strategy One: Longer Trains

The core component of Strategy One is operating Sounder South with 10-car trains and adding as much as 40 percent more carrying capacity from the 7-car trains in operation today. For Sound Transit to lengthen Sounder South trains, more coaches and space to store and maintain them when they are not in use is needed. Longer trains also require longer platforms to allow

passenger access to every car. These items, fleet, storage capacity, and platform extensions, are the initial priority investments for increasing capacity for Sounder South. Extending train lengths may also lead to increased crowding on station platforms. Sound Transit plans to address this with targeted access improvements at strategic locations where the needs are greatest.

Based on project delivery experience, 10-car train operations could take between five and a half and eight years to implement to allow for the completion of all platform extensions. It would take four to five years to acquire all the necessary coaches. Once Sound Transit extends the required platforms and makes the other necessary improvements, Sound Transit could implement longer trains incrementally based on demand. The following sections describe approaches to planning platform extensions, acquiring fleet, and securing storage and maintenance capacity.

4.1.1 Fleet Acquisition

Today, Sound Transit operates seven train sets for the Sounder South service, each made up of one locomotive, six coaches, and one cab car. Operating 10-car trains with the same number of trips would require up to 35 more coaches, including spares. Sound Transit would procure those cars to coincide with platform and storage track improvements, anticipating approximately four to five years to receive the coaches and prepare them to enter service. Figure 4-1 shows Sounder maintenance and layover locations.

4.1.2 Sounder Fleet Storage and Maintenance

Sounder South equipment is stored and cleaned overnight at the Century Yard in Lakewood and lays over in the middle of the day at Amtrak's Holgate Yard in Seattle. Once Sound Transit completes the Sounder Maintenance Base project in 2023, Century Yard will accommodate the longer trains that would be stored, cleaned, and maintained.

Amtrak has tentative plans to add tracks at Holgate Yard that would accommodate longer Sounder trains. Subject to confirming such plans, Sound Transit assumes a need for improvements at Holgate Yard, which could take between four and a half and six and a half years to plan, design, and construct.

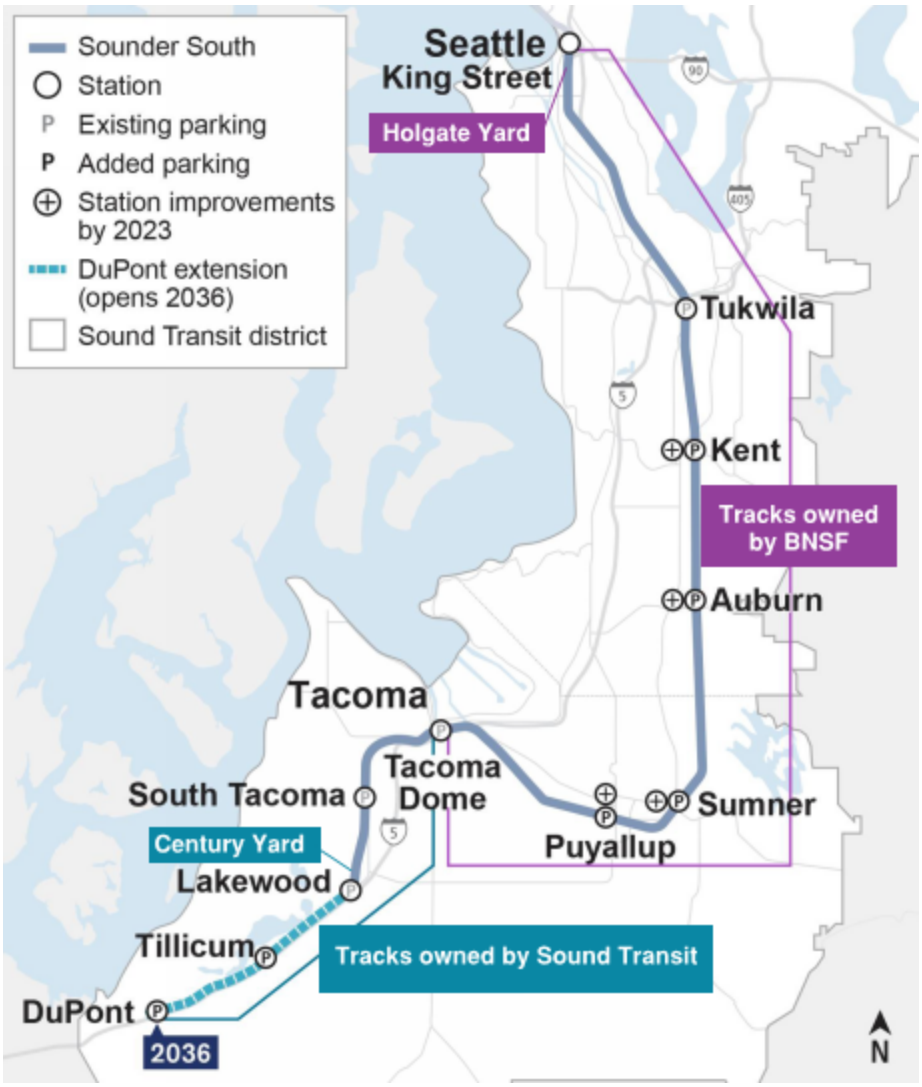


Figure 4-1 Sounder Maintenance Yards

4.1.3 Platform Extensions

Extending station platforms to accommodate 10-car trains varies in scope and difficulty depending on the station. Sound Transit anticipates planning and designing platform extensions to provide access to each train car, and to provide access to a specific car for passengers with mobility impairments. The platforms at Seattle, Tukwila, Kent, Auburn, Sumner, Puyallup, Tacoma Dome, South Tacoma, and Lakewood must be extended to accommodate access to each coach on a 10-car train. Sound Transit would plan and design platform extensions to address the unique characteristics of each station location. Figures 4-2 through 4-10 are conceptual representations of how the platforms may be extended. Additional design, further coordination with agencies and the public and environmental review is necessary is the next project development phase to establish platform extension configurations.

Figure 4-2 Lakewood Station Proposed Platform Extension

Figure 4-3 South Tacoma Station Proposed Platform Extension

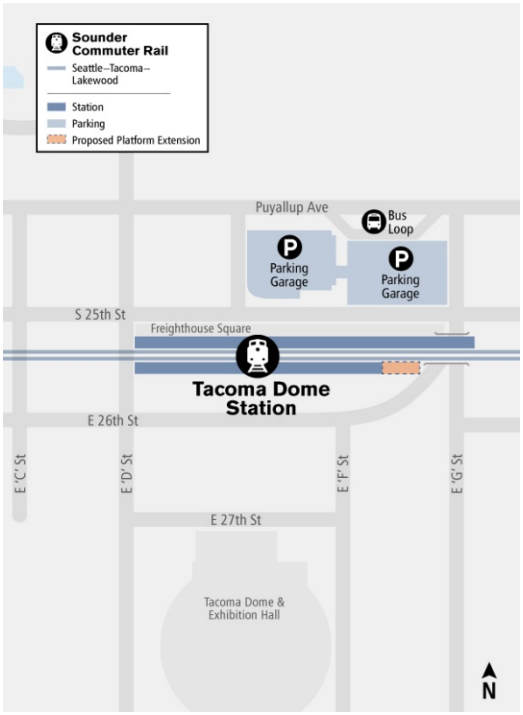


Figure 4-4 Tacoma Dome Station Platform Extension

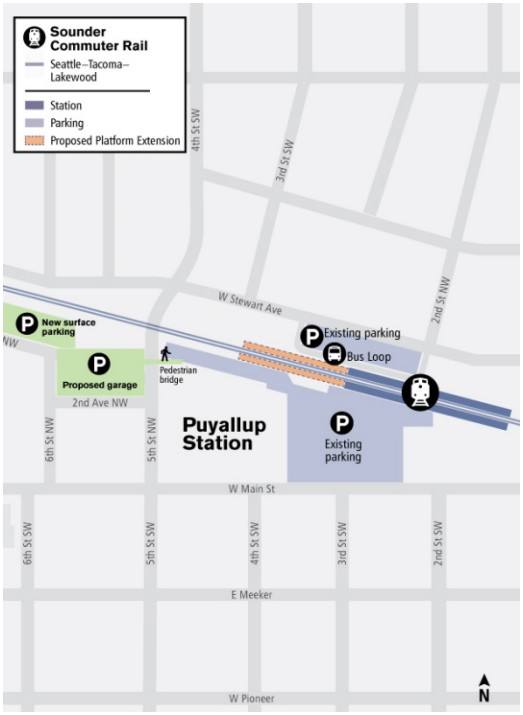


Figure 4-5 Puyallup Station Proposed Platform Extension

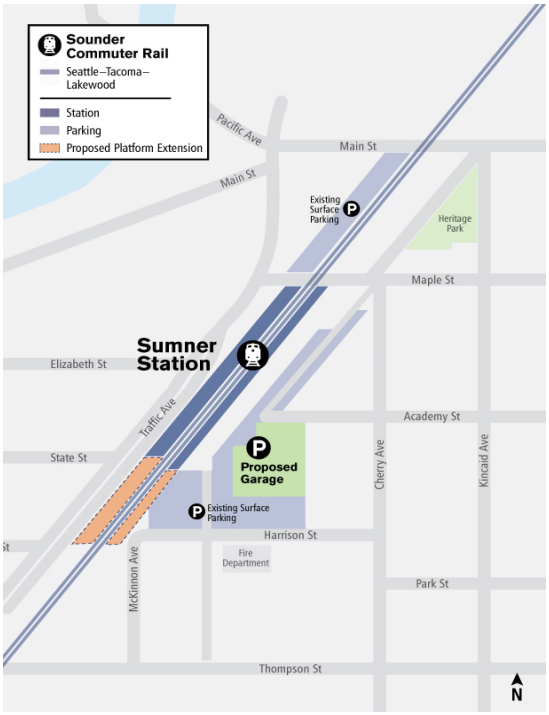


Figure 4-6 Sumner Station Proposed Platform Extension

Figure 4-7 Auburn Station Proposed Platform Extension

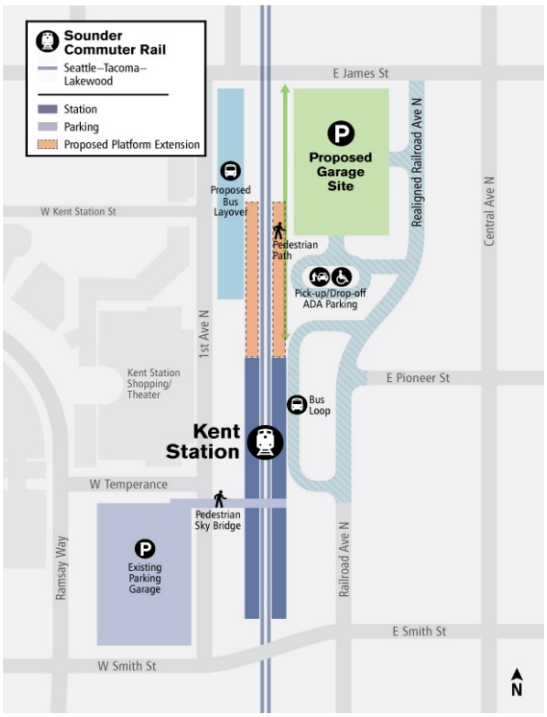


Figure 4-8 Kent Station Proposed Platform Extension

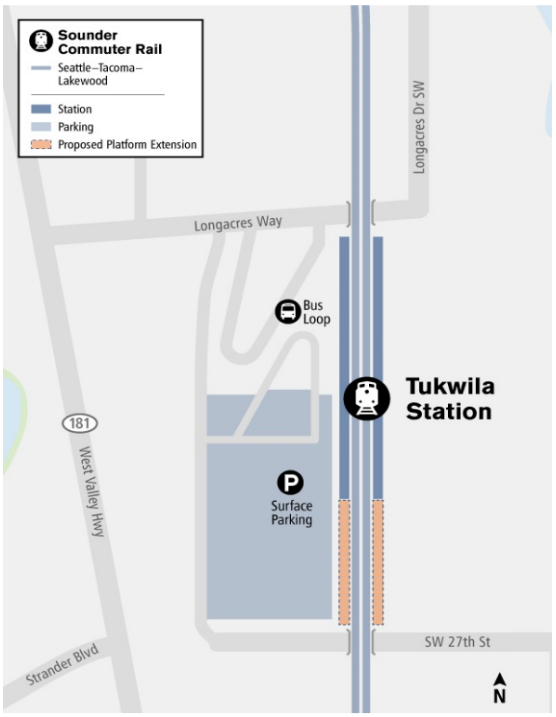


Figure 4-9 Tukwila Station Proposed Platform Extension

Figure 4-10 King Street Station Proposed Platform Extension

4.1.3.1 Passengers with Mobility Disabilities

Sound Transit is addressing the Americans with Disability Act (ADA) requirements, including the 2011 U.S. Department of Transportation rules, in planning and designing platform extensions. These rules require passenger rail service providers to offer full-length, level-entry boarding at new or altered platforms where no platform track is shared with freight trains or to seek federal concurrence for alternative compliance methods. Because freight trains share the tracks at each Sounder station platform and the freight car envelopes would overlap a full-length, level-entry boarding platform, Sound Transit plans to seek concurrence from the Federal Transit Administration on alternative compliance methods.

Table 4-1 Platform Extension Lengths, Directions, and Mini-High Relocation Requirements

Station	Platform	Extend. Dist. (ft.)	Extend Direction	Relocate Mini-high?
King Street	Track 3-4	25	South	N
Tukwila	East	255	South	N
Tukwila	West	255	South	N
Kent	East	335	North	Y
Kent	West	285	North	Y
Auburn	East	TBD*	TBD*	TBD*
Auburn	West	255	South	N
Sumner	East	255	South	N
Sumner	West	255	South	N
Puyallup	North	255	West	N
Puyallup	South	255	West	N
Tacoma Dome	North	0	N/A	Y
Tacoma Dome	South	95	East	Y
South Tacoma	East	255	North	Y
Lakewood	East	255	North	Y
* See Section 4.1.3.2 for discussion				

As previously noted, Sound Transit would plan and design platform extensions to address the unique characteristics of each station location. Table 4-1 conceptually shows initial planning assumptions for each location.

Since 2000, Sound Transit has utilized mini-high platforms to serve riders with mobility-related disabilities. Mini-high platforms are specialized facilities with a ramp to a smaller platform that is higher than the surrounding platform. Sound Transit uses mini-high platforms to provide level boarding for any passenger on one car per train. The mini-high platform is at the car floor height but their edge is set further back from the tracks than the rest of the platform to accommodate freight clearances. When Sound Transit acquired nine new cars in 2017, it equipped the new cab cars with car-borne lifts so that each train also has one car with a car-borne lift.

Figure 4-11 Passengers Leaving Train Using Bridge-plate and Mini-High Platform

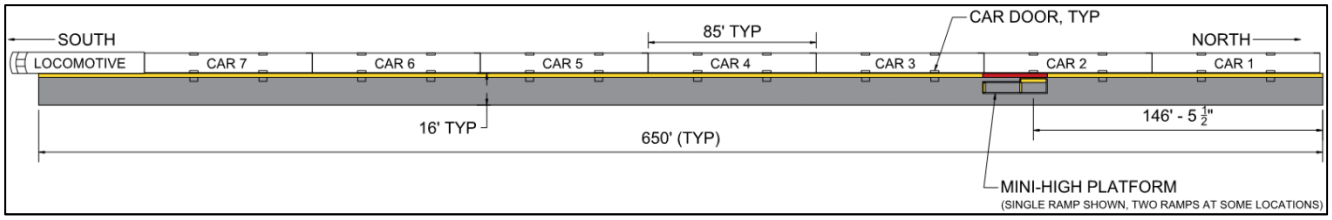


Figure 4-12 Layout of a Typical Sounder South Train and Platform Today

Passengers may board and exit Sounder cars from the mini-high platform using a bridge plate placed by the conductor (See Figure 4-11). The mini-high platforms are located in the same location at all stations (See Figure 4-12). Sound Transit operates Sounder to stop trains with Car 2, the second car from the northward end of the train, aligned with the mini-high platform.

Access to the Sounder system for riders of all abilities is a priority for Sound Transit. In the next project development phase, Sound Transit plans to work with agency partners at the Federal Transit Administration (FTA) and BNSF to confirm an acceptable plan to address the intent of the 2011 ADA law, given the compatibility complications of operating passenger rail on a freight train corridor.

4.1.3.2 Auburn Station Platform Extension Considerations

Auburn Station's east platform presents challenges for accommodating longer trains. Figure 4-13 shows the Auburn Station and the existing and planned elements as well as a representation of the extension of the west platform. Today, the peak-direction (morning northbound and afternoon southbound) trains usually stop at the east platform to provide passengers convenient access to the parking and bus connections on that side of the tracks. The new planned parking garage is to also be on the east side of the tracks.

The east platform is between the switch to BNSF's Stampede Pass main line to the south and the West Main Street grade crossing to the north. Extending the platform farther south may require modifications to the tracks and adjacent highway bridge. Sound Transit plans to work with the City of Auburn, BNSF, and other stakeholders to study these issues in greater depth during project-level planning as described in Section 3.4 of this plan.

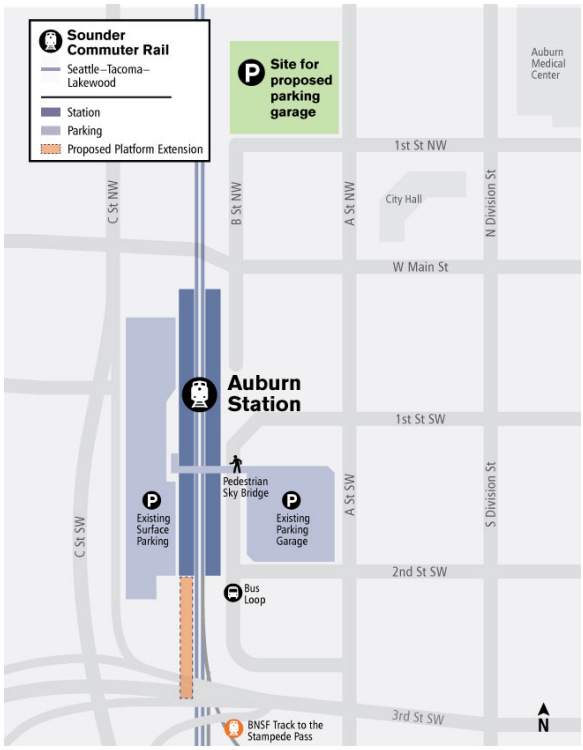


Figure 4-13 Auburn Station Proposed Extension

4.1.3.3 King Street Station Platform Considerations

As the terminal station for all Sounder service, 80% of all Sounder South riders use King Street Station which is more rider activity than any of the other eight Sounder South stations. It is the

hub of Sounder operations, with multiple trains arriving or departing within minutes of each other. The platform is a center platform constrained with tracks on both sides, with four points of egress for passengers provided by three stairways, and a single elevator. The platform is also narrower than other Sounder platforms and is constrained where the stairs and elevator are located.

Trains with ten cars would have up to 40 percent more passengers than today. To accommodate these changes in demand, Sound Transit plans to study opportunities to add access capacity at King Street Station to serve all Sounder users, and to undertake a future project-level assessment of options before determining investment priorities, as described in Section 3.4. Sound Transit also plans to coordinate any study of potential access improvements at King Street Station with on-going efforts for the West Seattle and Ballard Link Extensions project.

4.1.4 Optional Strategy to Address Crowding

The peak loading of Sounder South passengers could exceed the seated capacity of 7-car trains before all the improvements to accommodate longer trains are in place. This would mean that some trains would not meet Sound Transit's performance standards for passenger comfort as Sounder is to provide a seat for every passenger who is on board for longer than 30 minutes. To address this possibility, Sound Transit could pursue interim operation of 8-car trains to reduce the potential overcrowded trains until the improvements are in place.

4.1.4.1 8-Car Trains

Sound Transit could consider increasing train capacity by operating 8-car trains while working to implement the improvements necessary for 10-car trains. Operating 8-car trains would require purchasing eight more coaches, including a spare. Fleet acquisition could take three and a half to four years.

With the exception of King Street Station and Tacoma Dome Station, existing platforms are not long enough for 8-car trains, which means passengers using the eighth car would not have direct access to the platform at most stations. Should Sound Transit pursue 8-car train operations, it would consider two operational solutions to address access to the eight car. First, the train could stop twice to give riders access to the eighth car; this would add between 27 and 36 minutes to the current schedule. Second, the eighth car could overhang the platform at most stations, requiring passengers to pass between cars to reach the eighth car (See Figure 4-14).

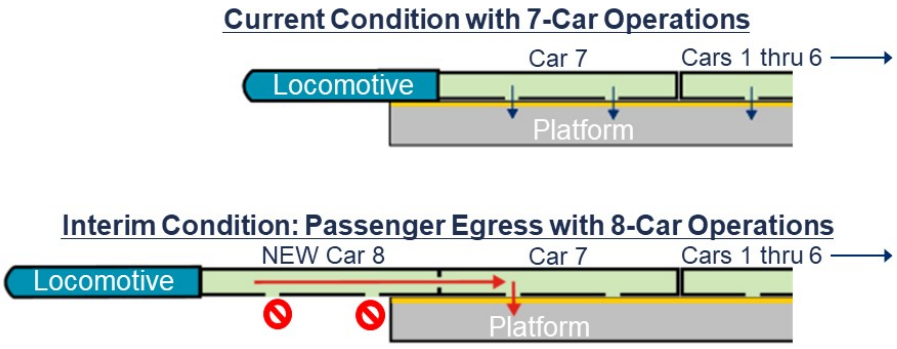


Figure 4-14 Optional Eighth Car Overhanging Existing Platform.

Operating 8-car trains in the current platform configurations could result in trains blocking adjacent grade crossing at Tacoma Dome station.

If necessary, Sound Transit could eliminate the blocking at Tacoma Dome Station and allow passengers direct access to all cars by relocating the mini-high platform on the longer north platform.

Subject to agreement with BNSF, Sound Transit could viably operate 8-car trains to address the projected growth of Sounder South ridership for a short period as soon as additional fleet is procured.

4.2 Strategy Two: More Trips

Strategy Two for expanding service focuses on adding Sounder South round trips and, possibly, broadening the hours of service in which Sounder operates. Sound Transit would negotiate with BNSF to develop a program of flexible-capacity improvements, which can be tailored to meet demand beyond 2030. This may also include adding an optional round trip to address crowding in the peak hours before 10-car train operations can start. This approach would provide the most favorable combination of system capacity and service reliability and respond to priorities highlighted by the public involvement process reported in Section 3.

When Sound Transit adds to the number of trains offered in peak commute times, Sounder South ridership has been shown to increase. Sound Transit projects a robust ridership response to adding service in the future.

Sound Transit would plan and implement expanded Sounder South service while providing for continued efficient operation of freight and Amtrak passenger services in the corridor, subject to agreement with BNSF. Sound Transit intends to work to reach agreement with BNSF regarding any increase in the number of Sounder South trains, including the necessary track and signal projects and easements for the line over which Sounder South trains operate. Sound Transit would also plan and implement improvements to accommodate more service on track it owns in the section from Tacoma south through Lakewood to DuPont; much of this section has a single main track, which constrains capacity and train schedules.

While increasing service frequency by adding more trips during the busiest travel periods could increase capacity during those times, narrowing the amount of time between trains could pose risks for service reliability. As part of the analysis supporting this plan, Sound Transit studied operating Sounder South trains at 15-minute headways rather than the current minimum 20-minute headways over the same track and signal network. Sound Transit found that adding trains and decreasing the time between trains could likely pose challenges for maintaining Sounder and Amtrak schedule reliability as well as BNSF freight service efficiency. Sound Transit intends to work with BNSF to determine whether operating service with 15-minute intervals can be accomplished while maintaining overall system reliability.

Sound Transit also examined adding a later evening train outside the 3.5-hour evening commute period. This examination used the concept of adding a late afternoon train leaving Lakewood for Seattle that would be turned back to become an evening train from Seattle to Lakewood. This concept would conflict with heavier BNSF freight train operations in the evening. As a result, Sound Transit would need additional track and signal improvements on

BNSF's corridor beyond what is needed to increase capacity during Sounder's morning and afternoon peak periods. Therefore, at this time, Sound Transit is not planning to pursue an evening train.

Strategy Two includes investing in additional fleet, maintenance and storage capacity, and track and signal improvements in both the Sound Transit-owned and BNSF-owned portions of the corridor to increase Sounder capacity and ridership during the peak commute.

4.2.1 Fleet Acquisition

The addition of two or more round trips would require additional locomotives, coaches and cab cars. Sound Transit would need to increase the Sounder South fleet by acquiring up to three locomotives, three cab cars, and 24 coaches, including spares, which could take up to six years to order, receive, and prepare all new equipment to enter service. Sound Transit will develop a fleet procurement plan and use it to update the overall fleet management plan.

4.2.2 Capital Investments – ST-Owned Right-of-Way

In order to add Sounder South train trips, Sound Transit may need to extend the second main track in Tacoma approximately three miles from South 66th Street past South Tacoma Station to East Pine Street to reduce the potential delays to Sounder and Amtrak trains when adding Sounder South trains. Sound Transit may include a second platform at South Tacoma Station if the desired Sounder South timetable places Sounder South trains heading in opposite directions at the station at or near the same time. This work would take between five and six and a half years to plan, design, and construct.

Sound Transit may also extend the second main track for about three-tenths of a mile from its current end at Bay Street in Tacoma to the junction with BNSF's tracks at TR Junction. This would further reduce the potential delays to Sounder and Amtrak trains when adding Sounder South trains. These projects on Sound Transit-owned right-of-way would be planned and evaluated in the next phase of project development. A number of factors, including available clearance under the I-5 bridges currently under construction and availability of ROW, would influence the scope of the project. This would take between five and seven years to plan, acquire property, design, and construct.

4.2.3 Capital Improvements – BNSF-Owned Right-of-Way

Sound Transit will likely need to make additional capital investments to expand capacity and secure access to the track for Sounder in the BNSF-owned part of the corridor to add round trips to the Sounder South service. These investments fall into two categories: track and signal infrastructure, and track access. Sound Transit would approach each as follows:

BNSF corridor track and signal infrastructure improvements: Sound Transit would work with BNSF to identify opportunities to add Sounder South service, and to plan, permit, design, and construct track and signal improvements that would add sufficient capacity to the rail corridor to maintain efficient operations for all services and accommodate anticipated growth. These improvements may include additional segments of main line track, switches, siding

tracks, signals, crossovers, and other features to allow the safe and efficient movement of trains through the corridor.

Access to BNSF track: Sound Transit would work with BNSF to develop new easements to provide access to the tracks for additional Sounder round trips. The value of such easements provide fair market compensation to BNSF for the loss of time on the tracks that they could otherwise use for freight service.

Sound Transit could undertake necessary permitting, property acquisition, and environmental documentation to implement improvements on the BNSF-owned corridor. Sound Transit would also work with BNSF to determine how best to efficiently design and construct mutually identified improvements. The estimated duration for this work is seven and a half to nine and a half years, based on past Sounder South improvements in the corridor.

4.2.4 Optional Strategy to Address Crowding

Sound Transit would consider requesting an additional round trip train prior to completion of the track and signal improvements if ridership demand significantly exceeds system capacity in the near term during the peak hour. To provide one additional trip, Sound Transit would need one or two locomotives, one or two cab cars, and between six and seven coaches, which could take between four and five years to procure and deploy. Prior to beginning to operate one or more round trips, Sound Transit would need to confirm the capacity for midday storage at Holgate Yard is sufficient and complete the Sounder Maintenance Base project so that overnight storage and maintenance at Century Yard are in place.

If the purpose of the optional round trip is to address crowding in the morning and afternoon peak hour before 10-car train operations can start, Sound Transit could consider inserting the trips during the two peak hours and shortening headways to 15 minutes. Operating four 8-Car trains in a one-hour timeframe provides a comparable capacity as operating three 10-car trains in the same time. As previously noted in Section 2, trips at 15-minute headways could pose additional risk to on-time reliability. Sound Transit, in consultation with BNSF, would weigh the needs, benefits, and issues of operating trains at 15-minute headways before making a decision.

In the past, Sound Transit and BNSF have negotiated and agreed to add trips without completed track and signal improvements, which recognized that the need for additional passenger capacity outweighed potential negative impacts to Sounder and freight service during the interim. Sound Transit would work with BNSF to evaluate the need for an additional round trip without track and signal improvements. The results of an agreement with BNSF and the time required to acquire additional equipment would dictate when Sound Transit could add service.

4.2.5 Coordination with Amtrak and WSDOT

Sound Transit has had and maintained strong partnerships with Amtrak and WSDOT over the past two decades, a period during which Sounder and the Cascades services grew in level of service and ridership. Sound Transit notes that WSDOT and Amtrak are developing an Amtrak Cascades Service Development Plan during 2020 to articulate long-term priorities for that service. As efforts ramp up to develop and implement the capacity expansion strategies

described this section, Sound Transit intends to work with both partners to coordinate activities as appropriate to benefit users of both Amtrak and Sounder services. The RailPlus program is an example of successful collaboration between the parties. Under RailPlus, riders of Amtrak Cascades and Sounder between Seattle and Everett are able to use their ticket on either service, giving riders more options and flexibility. Sound Transit looks forward to working with Amtrak and WSDOT to expand travel choices and explore activating Rail Plus in the Sounder South corridor when Amtrak service resumes on the Point Defiance Bypass.

4.3 Station Access Improvements

4.3.1 Approach to Platform Access

Station improvements include enhancing or creating additional connections for customers to access the extended platforms at existing stations that serve the Sounder South corridor. Sound Transit's station access strategy emphasizes providing safe and convenient connections to the station platforms, including the future platform extensions. Sound Transit's planning for these improvements would focus within the immediate station facility, and may consider improvements to support additional riders within a ¼ mile of the station platform.

The types of possible improvements could include some or all of the following:

- Additional pedestrian and bicycle connections to adjacent existing street or trail network or nearby employment centers.
- New or additional bicycle storage near the platforms.
- Improved connections to accessible routes or facilities.
- Additional passenger drop-off space (also known as kiss-and-ride).
- Pedestrian bridges over or pedestrian tunnels under the tracks linking the two platforms.
- Improvements to adjacent bus stops.
- Expanded bus layover space for express or RapidRide vehicles.
- Vehicular parking, subject to available funding.

Sound Transit plans to provide convenient access to extended platforms using the tools listed above. In addition, Sound Transit intends to evaluate the need for future access improvements at each station in the context of anticipated future agreement with BNSF regarding long-term capacity expansion.

4.3.2 How Sounder South Access Program Fits With Other ST and Partner Projects

Sound Transit undertook an evaluation of the existing stations for the types of deficiencies or gaps that could exist as longer trains come into service. The evaluation noted documented projects identified in local jurisdictional capital and transportation plans and the PSRC Transportation Improvement Program (TIP) to determine future planned improvements within

proximity to the existing stations. In addition, the evaluation documented projects identified for funding within the ST System Access Fund or alternative Sound Transit funding, such as the ST2 program. The potential improvements would complement the ongoing improvements planned by the local jurisdictions, King County Metro, Pierce Transit, and Washington State Department of Transportation (WSDOT).

In 2008, voters approved the ST2 Plan that built on the earlier Sound Move program. On the Sounder South corridor, ST2 included access improvements for commuter rail and bus riders at Sounder South stations. Improvements at Kent, Auburn, Sumner and Puyallup Stations have been identified through alternatives evaluation and environmental review. These investments will result in station specific bus and non-motorized improvements. Additionally over 2,000 parking stalls will be added among the four station access projects. At the South Tacoma and Lakewood stations Sound Transit is preparing to begin the alternatives evaluation, conceptual engineering and environmental clearance processes for access projects in 2020. Sound Transit intends to include a project-level assessment, including a review of the ST2 cost and budget assumptions, during the first phase of project development to determine a project scope. At Tacoma Dome Station access improvements are being identified and developed as part of the regional light rail Tacoma Dome Link Extension project.

4.4 Extension of Sounder to Tillicum and DuPont

In addition to expanding Sounder South service between Seattle and Lakewood, the ST3 Plan includes a representative project designated as Sounder Expansion to DuPont (as pictured in Figure 4-15). Sound Transit would extend Sounder South commuter rail service from Lakewood to DuPont with two new stations. Sound Transit plans to complete the project in 2036.

Figure 4-15 Sounder Expansion to DuPont

While the extension to DuPont is a separate, stand-alone project, this SDIP encompasses its eventual implementation. Sound Transit's fleet acquisition strategy to support Sounder South expansion would be sufficient to extend operations to DuPont.

The planned four round trips between DuPont and Lakewood would be scheduled to be an extension of current or future peak-period trips that are discussed in this SDIP as starting or ending in Lakewood. Sound Transit plans to determine which trips reach DuPont after negotiations with BNSF and through discussions with other stakeholders.

4.5 Putting the SDIP in Place

Implementation of the improvements called for in this plan would begin when the Sound Transit Board of Directors directs agency staff to initiate project development activities. Sound Transit anticipates beginning planning and implementation for individual projects identified in the SDIP on a rolling basis from starting in 2020. Sound Transit intends to coordinate improvements throughout the corridor and bring them into service after proceeding through project-level planning, public outreach, environmental review, preliminary engineering, property acquisition, final design, permitting, construction, and activation. Sound Transit continually coordinates with local, state, tribal, and federal governments, as well as freight railroads to facilitate project approval processes while properly addressing environmental and community concerns. Sound Transit plans to use a variety of analytical, project management and review techniques to make sure that the system provides the greatest regional benefits while putting each component of the SDIP in place.

4.5.1 Implementation Approach

Figure 4-16 presents the proposed investment approach to implementing both the operation of longer trains (Longer Trains and Platform Extensions) and more round trips (Potential Additional Service). The figure also presents how investment in station access improvements could occur through 2032 and beyond.

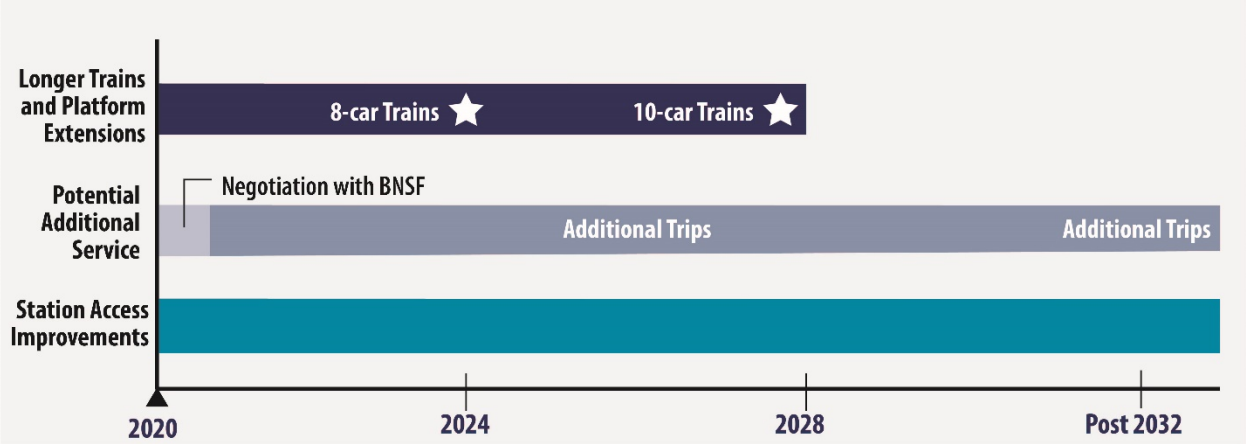


Figure 4-16 Sounder South Proposed Investments Approach

5 REFERENCES

Reports

David Evans and Associates, Inc. (DEA) 2019. *Comprehensive Operations Assessment (COA)*.

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