



Appendix D:
Social, Economic and Environmental Impacts;
Performance Characteristics by Mode; and
Integration with Regional Land Use

Sound Transit 2
A Mass Transit Guide
The Regional Transit System Plan
for Central Puget Sound

July 2008

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Link light rail • Sounder commuter rail • ST Express regional bus • Tacoma Link light rail

Easy connections to more places for more people.

– Sound Transit vision statement

Sound Transit plans, builds, and operates
regional transit systems and services to
improve mobility for Central Puget Sound.

– Sound Transit mission statement

Social, economic and environmental impacts

SOCIAL IMPACTS

The Sound Transit 2 Plan (ST2) will reduce our reliance on automobiles by improving the average citizen's ability to use mass transit to travel through the most congested corridors during rush hours.

Mobility and accessibility

Mobility and accessibility are challenges for everyone, and particularly so for people who do not own cars or for whom the daily costs of driving are a financial hardship. The addition of 36 miles of light rail, plus enhanced Sounder and ST Express systems, will expand opportunities for low income workers to commute to their jobs, and for those who are unable or who prefer not to drive in order to travel to and from a variety of destinations throughout the region. Workers living along or near Link, Sounder, or ST Express routes and stations and traveling to jobs in the off-peak direction, for example at SeaTac Airport, Northgate Mall, or other locations, will have the same frequent reliable service as travelers to Downtown Seattle or Downtown Bellevue.

For low income households, ST2 investments may make it possible to reduce the number of cars per household, and/or to reduce the annual miles driven and costs of operations and maintenance. For those who are unable to drive or cannot afford an automobile, ST2 investments will greatly expand their ability to travel quickly and reliably throughout the region, whether they live along a Sound Transit route, or connect via local transit or demand-response services.¹ Mobility and accessibility can be a particular challenge for elderly people and people with physical disabilities or limitations. For many senior citizens and persons with disabilities, transit often offers the only option for getting around. Increasing the extent of the light rail system can significantly improve mobility for these citizens.

Other social impacts of ST2 include support for the urban centers developed in Vision 2040 and now contained in county and local government comprehensive land use plans and policies in the region. While the urban centers concept was developed primarily to reduce traffic congestion and air pollution growth, it also has potentially beneficial social impacts in promoting pedestrian-oriented neighborhoods throughout the region, which in turn will increase social contacts within communities and strengthen community spirit.

¹ About 9 percent of the region's households are classified as low income, and of these households 26 percent do not have access to a car. (Of all households in the region, only 7 percent do not own or have access to a car.) About 17 percent of the population is disabled, and by 2040 almost 17 percent will be seniors. Compared to others, all of these individuals tend to have lower auto ownership rates, lower incomes, and be less likely to have a car available to them for their trips.

ECONOMIC IMPACTS

The Central Puget Sound region is not unique in its dependence on transportation to fuel its economic engine. What sets the central Puget Sound region apart from many other urbanized areas, however, are the extreme constraints that geography and topography place on the development of transportation corridors. For example, about a quarter of a million people cross Lake Washington every day using the only two routes available, I-90 and SR 520. Here, as elsewhere, the most congested sections of the freeway system experience gridlock for hours every day.

The investments planned as part of ST2 will not end congestion on the freeways. However, they will provide an alternative for drivers caught in traffic, free up road space for those with no other alternatives (including freight), and provide new high capacity alternatives for those who are unable, unwilling or who can't afford to drive. To those people who are able to use and benefit from the faster and more reliable transit services that comprise ST2, it will seem as though congestion has been eased substantially.

ST2 will provide major new rush hour capacity to and from the region's most congested destinations, as well as all-day, two-way reliable connections for commuters, shoppers and other travelers.

The economic benefits of the ST2 plan will be realized in many ways, some of which can be quantified and others of which are more difficult to measure. Taking into account the full costs of the ST2 Plan, Sound Transit estimates that the readily quantifiable benefits will be greater than twice the costs.

Quantifiable benefits

ST2 Plan quantifiable economic benefits include:

- Travel time savings for transit riders;
- Mobility benefits for non-transit users including commercial vehicles;
- Reductions in vehicle operating costs, including parking costs; and
- Reductions in accident costs and in pollution, noise and energy use.

Travel time savings

Travel time savings are shown in Appendix C (see page C-5) for both transit riders and non-transit users. These benefits constitute the largest share of the benefits of the ST2 Plan.

Vehicle cost savings

In addition to saving time, the region will save in vehicle ownership, operating and parking costs.

Savings in environmental costs

The ST2 investments can create environmental benefits by reducing air, noise and water pollution associated with auto travel. In addition, transit travel is more energy efficient than auto travel, creating economic benefits associated with energy conservation.

Benefits difficult to quantify

Job creation and retention

Improving the capacity and reliability of the transportation system directly supports the region's economy. It gives employers access to a broader base of workers, and gives individuals greater choice in where to live, work, recreate, shop and conduct personal business. It gives businesses better access to goods and services, and increases the ability of people to connect with each other and conduct business.

A 1999 study done for the American Public Transit Association concluded that business gains in sales are 3 times the investment in transit capital – a \$10 million investment yields \$30 million in sales.

In Portland, Oregon, Tri-Met estimates that over \$6 billion in development has occurred within walking distance of the MAX light rail stations since 1980.

In Dallas, property values near light rail stations are 13 percent higher than elsewhere, and in San Diego they are 17 percent higher.

While these types of calculations are difficult to replicate for a project that is not yet built, in city after city across the United States, the economic benefits of past investments in transit infrastructure are clear.

ST2 projects will create thousands of jobs in project management, design and construction, as well as ongoing jobs in operations and maintenance. If the dollars invested in ST2 were spent elsewhere, it would also create jobs, but the portion of the project costs that will be covered by federal grants would not otherwise come to the region. In 2006, USDOT estimated that 47,500 jobs are created for every one billion dollars invested in transportation.

Sound Transit's Guiding Principles provide for: workforce diversity reflective of the region; maximum use of local businesses; maximum use of small businesses; and maximum use of minority, women and disadvantaged businesses. There is also a requirement that a minimum percentage of labor on Sound Transit projects be performed by apprentices, with requirements for minority and female workers.

Transportation system reliability

Recent research on travel reliability shows an increased awareness of the importance of the reliability of transportation systems in large metropolitan areas. That awareness is heightened as existing transportation systems suffer increasing frequency of breakdowns when operating at capacity. As the importance of reliability grows, so does transit ridership, yielding even greater travel time savings to even more people.

Added capacity for travel

Whether going to work, school or shopping, or simply to visit friends, the ability to travel has economic benefits. ST2 adds major new travel capacity in some of the region's most congested corridors in all three counties. The added capacity for trips throughout the region will benefit individual travelers and the region as a whole. Additional information on transit capacity is shown in Appendix C.

Mobility for all

Improvements in transit provide broad benefits to those who cannot afford to own and operate a car, or who cannot or do not wish to drive, expanding opportunities for work, education, medical care, shopping and other opportunities that require travel. These benefits also accrue to other taxpayers.

ENVIRONMENTAL IMPACTS

In June 2005 Sound Transit issued a supplemental final environmental impact statement (SEIS) on the Regional Transit Long-Range Plan. The 2005 SEIS builds on and supplements the 1993 EIS prepared for the Regional Transit System Plan. It addresses newly available information on existing environmental conditions, and it evaluates the environmental impacts of, and potential mitigation measures for, adopting and implementing an updated Regional Transit Long-Range Plan, including specifically the development of the ST2 Plan investments.

The ST2 Plan investments will have a positive impact on the region's environment, including reduced energy consumption and air pollution and improved water quality. Sound Transit's 2005 SEIS for the Long-Range Plan details these impacts for different ranges of long-term investments; the ST2 Plan represents the moderate-to-aggressive end of these investment ranges. An overview of the impacts for air quality, water quality and energy use are presented here. In addition, the 2005 SEIS details impacts in the areas of transportation (see Appendix C of this plan), environmental health, ecosystem, aesthetic quality, parks and recreation, historic and cultural resources, and other areas.

The transportation sector represents over 50% of the regional carbon footprint, significantly more than the national average. Overall, the ST2 Plan represents an important step towards addressing the challenge of global warming by offering a reliable alternative to motor vehicle travel. The ST2 Plan will reduce Vehicle Miles Traveled (VMT) on our region's roadways which in turn reduces greenhouse gas emissions such as carbon dioxide. Internal estimates predict that implementation of the ST2 Plan will result in a reduction of about 268 million VMT in 2030 by providing an alternative to single occupancy vehicle use.

In addition, the ST2 Plan fosters transit-oriented development around stations, helping provide for compact, urban, sustainable communities that have relatively smaller carbon footprints.

Furthermore, the Sound Transit Board is committed to exploring ways to reduce, to the maximum extent practicable, the greenhouse gas emissions during construction and operation of the ST2 Plan.

Air quality

Forecasts for increased 2030 ridership and resulting changes in travel by all modes indicate that ST2 Plan improvements would reduce total regional VMT and vehicle hours traveled in 2030 with a corresponding reduction of motor vehicle emissions. With the ST2 Plan, both the number of VMT and the level of congestion, as measured by hours of vehicle delay, would be reduced. As a result, overall mobile source pollutant emissions, including carbon monoxide, nitrogen oxides, volatile organic compounds, hazardous air pollutants and greenhouse gases, within the plan area are expected to be lower compared to the No Action Alternative that was evaluated.

Sound Transit's light rail is electric powered and the use of electric vehicles will reduce transit vehicle emissions.

Sound Transit's regional transit providers are retrofitting their older bus fleets with particulate filters that remove approximately 90 percent of the diesel particulates that the buses previously released.

Sound Transit uses modern diesel commuter rail locomotives that produce substantially less air pollution than the majority of locomotives in use today. Sounder trains would produce approximately 30 percent less aggregate air pollutants per rider than three-person carpools.

Water quality

Potential water quality impacts include: (1) new impervious surfaces, (2) new pollutant-generating impervious surfaces, (3) flood plain fill, and (4) culvert extensions. The overall impact of ST2 projects on increasing the amount of pollutant-generating impervious surfaces will be relatively minor compared to the current amount of pollutant-generating impervious surfaces in the region, as well as compared to possible alternate investments in road capacity to carry the same number of trips.

Energy use

When compared to taking no action to improve the transit system, the ST2 Plan will result in a reduction in regional energy use for transportation.

Mitigating local impacts

In developing the projects for the ST2 Plan, the costs of environmental impact mitigation were included in the cost estimates for each project. For example, the Link extension from Seattle to Bellevue cites potential parkland, historic and wetland impacts and the need for environmental mitigation. For those projects in the early stages of development, detailed analysis of impacts and potential mitigation measures will be finalized in project environmental documents.

In addition to mitigating specific project impacts, ST2 projects also have the potential to mitigate some of the major impacts of other anticipated regional transportation projects. In the North Link corridor, for example, there is a major resurfacing (and possibly lane reconfiguration) project planned for I-5. Depending on the schedules of the two projects, Link to Northgate could provide an alternate route for travelers who might otherwise be caught in the additional congestion associated with this construction.

Environmental Management System

Sound Transit adopted a comprehensive Environmental Management System (EMS) in April 2004. The EMS consists of proactive management processes and procedures to document, assess and improve environmental compliance and performance. It incorporates environmental ethics into business operations and identifies environmental stewardship as a responsibility of all employees. Sound Transit's Environmental Policy, which serves as the foundation of the EMS, commits the agency to being an environmental leader in the State of Washington and to "the protection of the environment for present and future generations as we provide high-capacity transit to the Puget Sound region."

Additionally, in 2008 Sound Transit became only the sixth transit agency in the United States, and the first on the West Coast, to hold itself accountable for achieving rigorous international standards for promoting environmental sustainability. This commitment earned Sound Transit ISO 14001 certification. To meet the requirements for ISO 14001, an organization must put in place management tools enabling it to identify and control the environmental impact of its activities, products or services and to improve its environmental performance continually. It must also implement a systematic approach to setting environmental objectives and targets and to demonstrating that they have been achieved.

Performance characteristics by mode

SYSTEM AND SERVICE PHILOSOPHY AND IMPACTS

Sound Transit's role is to provide the Central Puget Sound with a regional network of high-capacity transit services. As defined by Sound Transit's enabling legislation, high-capacity transit means service operating principally on exclusive rights-of-way and providing a substantially higher level of passenger capacity, speed and service frequency than public transit operating on highways and city streets in mixed traffic.

This role is further defined by the Puget Sound Regional Council's land use plan, Vision 2040, and the Metropolitan Transportation Plan, which together define a goal to establish a region-wide transit system that connects regional growth centers, provides seamless connections with local transit and ferries, and supports concentrated development at and around stations.

Within this framework, the ST2 Plan proposes to continue and expand the regional high-capacity network established in *Sound Move*. Link light rail will add 36 miles extending to Snohomish County and across Lake Washington to King County's eastside. The ST2 Plan will add new or improved Sounder commuter rail stations and access improvements. The ST2 Plan also includes contributions to new ST Express bus facilities in Bothell and Burien. Consistent with the major expansion in rail services, some existing express bus routes will be replaced with rail.

Service characteristics for Sound Transit's three modes are consistent with the mandate to operate high-capacity transit with frequent, fast service.

ST EXPRESS BUS

ST Express operates frequent, all-day bus service on major corridors between centers, with half-hour headways or better, from about 6:00 in the morning or earlier until about 10:00 at night. ST Express buses operate on freeway HOV facilities where they are available, including a series of freeway direct access ramps built as part of *Sound Move*, which improve speed and help ensure reliability.

ST Express buses serve major urban centers as well as outlying park-and-ride lots and transit centers, and they connect to Sounder and existing and future Link stations. All buses carry bicycles; some serve mixed-use transit centers with commercial and residential development integrated into the center.

SOUNDER COMMUTER RAIL

Sounder commuter rail currently operates between Everett and Tacoma and, when the *Sound Move* investments are completed, will extend to South Tacoma and Lakewood.

By the end of 2008, Sounder commuter rail will operate eight daily round trips between Tacoma and Seattle and four daily round trips between Seattle and Everett. Eventually, trains will operate approximately every half hour during the morning and afternoon weekday peaks. Special service also serves Mariners baseball and Seahawks football Sunday home games.

Fifty-eight bi-level passenger cars seat 140 passengers each, with room for bikes and wheelchairs. Amenities include work tables, power outlets, cup holders and overhead storage. Maximum speed is 79 mph, and the travel time from Everett to Seattle or Seattle to Tacoma is about an hour. There are currently 10 stations in service; when *Sound Move* is completed there will be 12 stations in service. ST2 investments will improve some stations and add parking.

LINK LIGHT RAIL

Tacoma Link currently operates electrically-powered single-car trains between the Tacoma Dome Station and Downtown Tacoma. At the Tacoma Dome Station it connects with Sounder, ST Express, Greyhound and Amtrak, and in downtown it connects with Pierce Transit's local bus service. Tacoma Link serves the University of Washington Tacoma, the Washington State History Museum, the Museum of Glass, the Convention Center, the downtown business district and the Broadway Theater District. Trains operate every ten minutes.

Central Link, now under construction between Downtown Seattle and Sea-Tac International Airport, is a 16-mile electric light-rail line with 13 stations, predominantly on exclusive right-of-way. Initial service will be with two-car trains, but the station platforms can accommodate up to four-car trains for future service expansion as demand grows.

When service begins operating in 2009 it is expected that trains will run approximately every six minutes during peak hours and every 10 to 15 minutes off-peak and at night. The trip between Downtown Seattle and Tukwila will take about 30 minutes. A planned extension to the University of Washington is expected to begin operating in 2016. By 2030 the ridership on Central Link is expected to exceed 110,000 riders a day.

As part of ST2, Link will be extended north to Lynnwood, south to Redondo/Star Lake, and east across Lake Washington to the Overlake Transit Center area of Redmond. The technology will be the same as Central Link, with exclusive and largely grade-separated rights-of-way.

Integration with regional land use planning and transit-oriented development

REGIONAL LAND USE PLANNING

ST2 investments are consistent with the vision and goals in the region's land use, growth management and transportation plans. Light rail, commuter rail and express bus services will carry thousands of people in the region's most dense, most highly congested corridors, and these transit services will deliver people to and from the hearts of the region's downtowns and other activity centers.

Achieving Vision 2040

Vision 2040, adopted by the PSRC in 2008, establishes a regional growth management strategy for Central Puget Sound based on defining urban growth boundaries, containing growth within those boundaries and concentrating new development in multiple centers linked by a high quality transportation network, including high-capacity transit in major corridors.

ST2 will provide an important piece of the transportation components necessary to implement Vision 2040. ST2 supports the Vision's strategy of concentrating growth within urban growth boundaries and supporting that growth with robust mass transportation alternatives such as light rail, express bus and commuter rail services. For example, the urbanized portions of Pierce, King and Snohomish counties are within a defined urban growth boundary whose population is expected to increase by one million people by 2030. The employment within that boundary is expected to increase by about 600,000 jobs. ST2 includes high-capacity transit service that will serve over 50 percent of the employment in PSRC designated urban centers in 2030.

Looking ahead to 2030, by which time the region will need to accommodate more than one million new residents, successfully confining growth within urban growth boundaries will depend on the region's ability to develop adequate infrastructure to support more dense development. High-capacity transit is central to this effort.

Since the initial adoption of Vision 2040, the region has repeatedly affirmed its growth management strategy in adopted regional, county and city comprehensive plans. The most recent Metropolitan Transportation Plan, Destination 2030 (PSRC, 2001), calls for the region's high-capacity transit system to continue to develop and expand to help meet growing demand, together with the expansion of all forms of transportation—local transit, carpools and vanpools, ferries, airplanes, automobiles, freight, bicycling and walking.

Sound Move, Sound Transit's initial phase of regional high-capacity transit investments, is already addressing many regional mobility needs. The investments of *Sound Move* will continue to provide benefits for decades to come. However, *Sound Move* was intended to be the first phase of a more extensive regional high-capacity transit investment. Growth has worsened the region's transportation problems and there is a continued need to address high-capacity transit planning and investment.

Between now and 2030, population is expected to grow approximately 30 percent, with a projected 35 percent growth in employment and a 30 percent increase in vehicle miles traveled. In recent decades, miles traveled has grown twice as fast as population and four times as fast as employment.

Fortunately, future projections show the relative growth in travel moderating compared to the recent past, largely because of the leveling off of certain demographic trends such as the increase in numbers of workers per household.

The region's transportation capacity for all modes has not kept pace with growth, and new growth means that transportation conditions will worsen even further. Many of the region's roads and freeways are already operating at capacity for many hours during the day. With more vehicles on the road, congestion and delay will be more severe and trips will be slower and more unpredictable.

The expanded high-capacity transit system in the ST2 Plan will provide an effective and reliable alternative to driving and an efficient way for people to move throughout the region. The expanded high-capacity transit system implements an integral transportation component of Vision 2040 and Destination 2030.

Reducing land area devoted to parking

Extending the regional mass transit system to more of the region's employment centers will enable many more employees to travel to jobs in those centers by high quality transit instead of by car. This will, in turn, reduce the demand for parking in those employment centers. Parking cars in structures requires 300 to 400 square feet per car, which means that a single worker with a car requires about twice as much space as a worker without a car. By reducing demand for parking in urban centers, more land can be devoted to productive economic activity and less to storing vehicles.

TRANSIT-ORIENTED DEVELOPMENT

During *Sound Move* implementation Sound Transit has had a Transit-Oriented Development (TOD) Program. The purpose of this program has been to encourage easy access to high-capacity transit and easy transfers between commute modes, including walking, bicycling, other transit service and, where appropriate, driving. Sound Transit has worked with public and private partners to promote such connections. Sound Transit will continue its TOD Program in the ST2 Plan.

Sound Transit and its partners have effectively located transit stations to support and generate TOD during *Sound Move* implementation. Notable examples are the Sumner Town Center, the Tacoma Dome District, the Newberry Square Project at the Ash Way park-and-ride lot, the Othello Station development in Seattle, and new development and redevelopment around Sounder stations in Kent and Auburn. Virtually every city with Sound Transit projects worked with Sound Transit to develop station area plans. These plans intend that development in and around stations maximize the value of the transit investment to the communities it is designed to serve.

During the implementation of ST2, Sound Transit's TOD Program will strive to achieve pedestrian-friendly development around the high-capacity transit stations. The ST2 TOD program will promote development resulting in:

- reduced automobile use made possible by a shift from cars to walking and transit;
- higher transit ridership;
- enhanced livability and walkability in the communities Sound Transit serves;
- calmed traffic and reduced local congestion;
- streets designed to promote a sense of community within the station area;
- the ability to manage parking demand;
- a more sustainable environment, both locally and regionally;
- reductions in energy consumption, especially fossil fuel reductions;
- reductions in the emission of pollutants, especially greenhouse gases; and
- more diversity in the economic bases of communities near stations.

TOD project design emphasis will include a focus on facilitating station access for pedestrians, bus riders, bicyclists, station drop-offs, and where appropriate, parking.

The ST2 Plan includes 19 new light rail stations and 10 new or improved Sounder stations. Sound Transit will work with local jurisdictions, partner agencies and private interests to encourage mixed-use, pedestrian oriented development around stations.

Sound Transit will prioritize efforts in communities that are already encouraging increased density through locally developed zoning and comprehensive plans.

Sound Transit will encourage public-private partnerships on a voluntary basis. Sound Transit has a variety of tools it can use to encourage TOD. One is facility design and location. Another is through real estate transactions. A third is through service planning. All of these tools necessitate active cooperation with stakeholders and partner agencies. Even where a partnership cannot be achieved, Sound Transit will, to the extent practicable, incorporate TOD into station planning.

In the case of real estate transactions, it is important to note that Sound Transit does not have authority to purchase property to engage in speculative development. All property transactions involving Sound Transit must follow a rigid set of procedures designed to protect the rights of property owners.

Where a willing seller is present, Sound Transit may acquire additional property in order to facilitate TOD opportunities consistent with local land use plans and regulations.

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