SOUND TRANSIT
STAFF REPORT

MOTION NO. M2006-72

Sound Transit Service Standards

Meeting:	Date:	Type of Action:	Staff Contact:	Phone:
Board	10/12/06	Action	Martin Minkoff, Director, Transportation Services **Mike Bergman, Program Manager, Service Planning & Development**	(206) 398-5111 (206) 398-5358

Contract/Agreement Type:	✓	Requested Action:	✓
Competitive Procurement		Execute New Contract/Agreement	
Sole Source		Amend Existing Contract/Agreement	
Agreement with Other Jurisdiction(s)		Budget Amendment	
Real Estate		Property Acquisition	

PROJECT NAME

Sound Transit Service Standards and Performance Measures – 2006 Edition

PROPOSED ACTION

Adopts the *Sound Transit Service Standards and Performance Measures – 2006 Edition* as guidelines for the design and on-going evaluation of Sound Transit's express bus, commuter rail and Tacoma Link light rail services.

KEY FEATURES of PROPOSED ACTION

- Staff currently uses service standards developed in 1998 to plan, evaluate and modify Sound Transit Express bus service. The standards provide guidelines for service design, service evaluation and the service change process. Staff is recommending Board adoption of the *Service Standards and Performance Measures – 2006 Edition* (Attachment A to this Motion) to update the 1998 bus standards and to provide new standards for Sounder commuter rail and Tacoma Link light rail.

- For consistency, the *Service Standards and Performance Measures – 2006 Edition* uses the same performance indicators as used in the *Service Delivery Performance Report to the CEO,* which is distributed to the Board quarterly. That report summarizes service performance by mode. However, the Service Standards also include more detailed indicators, such as route-level bus productivity.

- Guidelines for Central Link light rail service will be developed later and are proposed to be incorporated into the Service Standards by amendment.

BUDGET IMPACT SUMMARY

There is no action outside of the board-adopted budget; there are no contingency funds required, no subarea impacts, or funding required from other parties other than what is already assumed in the financial plan.

BUDGET TABLE

Not applicable to this action.

M/W/DBE – SMALL BUSINESS PARTICIPATION

Not applicable to this action.

PROJECT DESCRIPTION and BACKGROUND for PROPOSED ACTION

Purpose
Service standards are a set of guidelines used to design, evaluate and modify transit service. They are not intended as rigid planning rules but as a tool to assist Sound Transit staff and the Board in making decisions about service. The current Sound Transit *Service Standards and Performance Measures* were developed in 1998 and provide guidance on express bus service design, service evaluation and the service change process. In the intervening years, the service standards have been invaluable as guideposts for the phased implementation of ST Express bus routes and have helped to clearly define the role of Sound Transit's bus service in the region's overall transit network. However, based on operating experience, some changes and additions to the bus standards are appropriate, and standards are needed for Sounder commuter rail and Tacoma Link light rail, two Sound Transit services which did not exist in 1998.

The *Service Standards and Performance Measures – 2006 Edition* addresses these shortcomings. There are separate chapters for each transit mode: ST Express bus, Sounder commuter rail and Tacoma Link light rail. The service concept and service design guidelines are described for each mode, followed by a section on the service evaluation and adjustment process. The service evaluation section also describes the development of the annual Board-approved Service Implementation Plan (SIP) and the proposed criteria for making minor administrative service changes not requiring Sound Transit Board action.

The Service Standards uses the same system performance indicators used in the *Service Delivery Performance Report to the CEO,* which is distributed to the Board quarterly. However, the Service Standards also include more detailed indicators, such as route-level performance ratings.

All changes and updates from the 1998 bus standards are summarized at the beginning of each section.

ST Express Bus
For ST Express, the service design guidelines are particularly important so that Sound Transit bus service reflects the operating parameters and service characteristics of the *Sound Move* plan. Based on operating experience since 1998, the updated guidelines allow for the operation of bus routes with rush-hour only service and provide more flexibility to consider route "deviations," or routings that deviate from the most direct path, if such a change would result in

significant ridership gains. There are also changes to the bus service evaluation process, including the addition of guidelines for special bus service serving events.

A key measure of ST Express performance is the productivity rating for individual bus routes, since this evaluation helps to identify which routes may be candidates for major service changes in the annual SIP. Individual routes are rated by comparing their productivity with the productivity of the system as a whole. The three productivity measures proposed for the ST Express service evaluation process are 1) Boardings per revenue vehicle hour, 2) Boardings per scheduled trip, and 3) Purchased transportation cost per boarding (new). The performance in each measure is combined to calculate an overall score. The measures are readily understandable, easy to calculate and widely used by other bus transit systems.

There are four productivity ratings for ST Express routes: Good, satisfactory, marginal and unsatisfactory. The table below shows the ST Express route productivity ratings using both the current service standards and the proposed new standards, which include the cost per boarding measure. (Note: This table is based on early 2006 ridership data. Since that time, Route 585 has been discontinued and Route 582 has been reduced to peak period service only).

	Productivity Ratings	
Route	**Current Standards**	**Proposed Standards**
510/513 Everett-Seattle	Satisfactory	Satisfactory
511 Lynnwood-Seattle	Satisfactory	Good
522 Woodinville-Seattle	Satisfactory	Satisfactory
530/532 Everett-Bellevue	Marginal	Marginal
535 Lynnwood-Bellevue	Unsatisfactory	Unsatisfactory
540 Redmond-U. District	Marginal	Marginal
545 Redmond-Seattle	Satisfactory	Satisfactory
550 Bellevue-Seattle	Satisfactory	Good
554 Issaquah-Seattle	Marginal	Marginal
555/556 Issaquah-Northgate	Satisfactory	Satisfactory
560 West Seattle-Bellevue	Marginal	Marginal
564 Auburn-Overlake	Marginal	Marginal
565 Federal Way-Overlake	Marginal	Marginal
574 Lakewood-SeaTac	Unsatisfactory	Unsatisfactory
577 Federal Way-Seattle	Marginal	Marginal
582 Bonney Lake-Tacoma	Unsatisfactory	Unsatisfactory
585 Lakewood-Auburn	Unsatisfactory	Unsatisfactory
586 Tacoma-U. District	Marginal	Marginal
590-595 Lakewood-Seattle/Tacoma-Seattle	Marginal	Marginal

Sounder Commuter Rail

For the first time, service evaluation standards are proposed for Sounder commuter rail, using many of the same performance measures used for ST Express. These standards cover service availability, on-time performance, passenger load guidelines and productivity. The ability to make service adjustments in response to changes in ridership and productivity is much more limited than with ST Express since service levels were largely determined during the systems design process and subsequent agreements with the operating railroads. The large capital

investment in stations, rolling stock and infrastructure also must be taken into account when considering such adjustments. However, the proposed service standards provide a process for objectively evaluating the productivity of individual train trips to better understand when remedial actions may be needed. For low-ridership train trips, such actions might include increased marketing and promotion, small scheduling adjustments to improve customer convenience, promotional fare discounts or other steps aimed at increasing ridership and productivity. Train lengths (consists) could also be reduced to decrease operational costs. Conversely, train trips that are overcrowded may be candidates for more cars, small scheduling adjustments to spread demand or the implementation of another trip, if feasible.

Since each Sounder train trip represents a large increment of both operating cost and passenger-carrying capacity, trip-level productivity ratings would focus on the performance of each scheduled train trip compared with the line average (North or South line). Sounder is still in the start-up phase, with only about half of the planned number of daily trains in service. Thus, staff recommends that the process for evaluating trip-level Sounder productivity begin with the 2010 Service Implementation Plan, or whenever all planned trains will have been in operation for at least two years. In the interim, system-wide performance measures (including productivity) will continue to be reported in both the SIP and the *Service Delivery Quarterly Performance Report to the CEO.*

Tacoma Link Light Rail
Like ST Express and Sounder, the proposed service evaluation standards for Tacoma Link cover service availability, on-time performance, passenger load guidelines and productivity. To measure the productivity of individual trips, service is segmented into periods by time of day and day of the week. The productivity of the different time periods is compared to the Tacoma Link system average and then rated according to specific performance criteria, with lower productivity standards for off-peak periods.

The Service Standards and Performance Measures 2006 Edition also includes guidelines for the operation of special service, which in the Tacoma Link context is service operated outside of regular service hours. These guidelines establish four essential criteria for such services, including the availability of adequate staffing and security. In addition to the essential criteria, special service that is financially supported by outside parties is more likely to receive consideration.

Title VI Evaluation
The *Service Standards and Performance Measures - 2006 Edition* provide for an annual process to assess the impacts of proposed service changes on minority transit users and communities, using methodology approved by the Federal Transit Administration. This assessment, which would be included in the annual SIP, would evaluate proposed service changes on all three Sound Transit modes.

Summary
Board adoption of the *Service Standards and Performance Measures – 2006 Edition* is requested at this time so that the proposed 2007 SIP (recommending service changes to be implemented in 2007) is consistent with the new standards. Staff proposes to develop standards for Central Link light rail at a later date and incorporate them into the Service Standards by amendment.

The Sound Transit Board retains the final decision-making authority on service changes and may consider other factors that are not included in the service standards when making decisions about service.

Prior Board/Committee Actions on this Project

Motion/Resolution Number and Date	Summary of Action
R98-46 11/12/98	Adoption of the ST Express Bus System Plan. Attachment A in this resolution referenced Service Standards and Performance Measures for ST Express.

CONSEQUENCES of DELAY

Board adoption of the Sound Transit Service Standards and Performance Measures – 2006 Edition would ensure compatibility with the service assessment included in the 2007 SIP and allow new service proposed for 2007 to be evaluated based on the new standards.

PUBLIC INVOLVEMENT

Not applicable to this action.

ENVIRONMENTAL COMPLIANCE

Not applicable to this action.

LEGAL REVIEW

JW 9/28/06

SOUND TRANSIT

MOTION NO. M2006-72

A motion of the Board of the Central Puget Sound Regional Transit Authority adopting the Service Standards and Performance Measures - 2006 Edition as guidelines for the design and on-going evaluation of Sound Transit's express bus, commuter rail and Tacoma Link light rail services.

Background:

Purpose
Service standards are a set of guidelines used to design, evaluate and modify transit service. They are not intended as rigid planning rules but as a tool to assist Sound Transit staff and the Board in making decisions about service. The current Sound Transit *Service Standards and Performance Measures* were developed in 1998 and provide guidance on express bus service design, service evaluation and the service change process. In the intervening years, the service standards have been invaluable as guideposts for the phased implementation of ST Express bus routes and have helped to clearly define the role of Sound Transit's bus service in the region's overall transit network. However, based on operating experience, some changes and additions to the bus standards are appropriate, and standards are needed for Sounder commuter rail and Tacoma Link light rail, two Sound Transit services which did not exist in 1998.

The *Service Standards and Performance Measures – 2006 Edition* addresses these shortcomings. There are separate chapters for each transit mode: ST Express bus, Sounder commuter rail and Tacoma Link light rail. The service concept and service design guidelines are described for each mode, followed by a section on the service evaluation and adjustment process. The service evaluation section also describes the development of the annual Board-approved Service Implementation Plan (SIP) and the proposed criteria for making minor administrative service changes not requiring Sound Transit Board action.

The Service Standards uses the same system performance indicators used in the *Service Delivery Performance Report to the CEO,* which is distributed to the Board quarterly. However, the Service Standards also include more detailed indicators, such as route-level performance ratings.

The Sound Transit Board retains the final decision-making authority on service changes and may consider other factors that are not included in the service standards when making decisions about service.

Motion:

It is hereby moved by the Board of the Central Puget Sound Regional Transit Authority that Service Standards and Performance Measures - 2006 Edition are hereby adopted as guidelines for the design and on-going evaluation of Sound Transit's express bus, commuter rail and Tacoma Link light rail services

APPROVED by the Board of the Central Puget Sound Regional Transit Authority at a regular meeting thereof held on October 12, 2006.

John W. Ladenburg
Board Chair

ATTEST:

Marcia Walker
Board Administrator

SERVICE STANDARDS AND PERFORMANCE MEASURES

2006 EDITION

ST EXPRESS REGIONAL BUS
SOUNDER COMMUTER RAIL
TACOMA LINK LIGHT RAIL

SOUNDTRANSIT
RIDE THE WAVE

TABLE OF CONTENTS

SERVICE STANDARDS AND PERFORMANCE MEASURES- 2006 EDITION

INTRODUCTION

PURPOSE

Service standards are a set of guidelines that are used to design, evaluate and modify transit service. Because funding available for Sound Transit service is limited, there is a need to obtain optimum efficiency and effectiveness out of each component of the system while maintaining or improving the quality of service. In addition, the planning and day-to-day management of transit service should be based on criteria that is explicit and yet flexible in interpretation and application. These Service Standards are intended not as rigid planning rules but as a tool to assist Sound Transit staff and Board members in making decisions about service.

BACKGROUND

The first edition of the *Service Standards and Performance Measures* was developed in 1999, shortly before the introduction of ST Express bus service. In the intervening years, the service standards have been invaluable as guideposts for the phased implementation of ST Express and have helped to clearly define the role of Sound Transit's bus service in the region's overall transit network. Since 1999, Sound Transit has gained considerable operating experience with express bus service, completing implementation of the *Sound Move* bus route network, and adding Sounder commuter rail and Tacoma Link light rail to its service portfolio.

In the introduction to the original 1999 service standards, the authors saw the need for the document to be flexible and pragmatic: "These service standards will be continuously updated to reflect changing conditions. As new types of services and data sources are introduced, revisions to the guidelines may become appropriate." To that end, this new edition of the service standards reflects much of what Sound Transit has learned since 1999. There are important changes to the standards for ST Express, and for the first time, service standards are provided for Sounder commuter rail and Tacoma Link light rail reflecting the different operating characteristics of each mode. As part of a comprehensive agency approach to performance monitoring and management, the new service standards use performance indicators that are commonly used in the transit industry and that are consistent with those used in the *Service Delivery Quarterly Performance Report to the CEO.* This report is issued on a regular basis by the Transportation Services Department and is posted on Sound Transit's web site.

ST EXPRESS BUS SERVICE STANDARDS

The ST Express Service Standards are intended to assist in the planning, implementation and on-going monitoring of the ST Express bus system. There are three sections:

A) The *ST Express Service Concept*, a general overview of ST Express service characteristics;

B) *ST Express Service Design Guidelines*, general principles on how ST Express service should be designed and operated to support these characteristics; and

C) *Service Evaluation and Adjustment Process* for reviewing the performance of existing and proposed ST Express services.

A. ST EXPRESS SERVICE CONCEPT

Sound Move, Sound Transit's Phase I master plan, includes this description of the Regional Express bus system (now called by the brand name "ST Express"):

"Regional express bus services are high-speed routes that operate in both directions throughout the day. These routes would operate primarily on existing, heavily traveled state and federal Interstate corridors using HOV lanes and major arterials with necessary improvements to maintain travel speeds and reliability consistent with Sound Move. These corridors would provide substantially higher passenger capacity, speed and service frequency than existing service. The routes would be provided in corridors without rail service or in corridors where rail is planned (to help build a strong transit market before the rail line is in place). When the rail system is extended along corridors served by regional bus, the bus route may be eliminated to avoid duplicating service" -*Sound Move,* Appendix D, Page D-4.

Sound Move also listed these specific characteristics of ST Express routes:

- Serves a major travel corridor directly
- Operates all day, every day
- Runs frequently, generally with 15 minute two-way service
- Operates at reasonably high speeds, generally averaging 18 to 20 m.p.h. with stops, using HOV lanes and other systems giving priority to transit such as signal preemption when available
- Connects two or more of the designated VISION 2020 urban centers
- Crosses city or county boundaries, and carries a significant portion of passengers traveling between jurisdictions
- Provides connections to commuter rail, light rail, ferries, other express buses and local service networks.

B. ST EXPRESS SERVICE DESIGN GUIDELINES

The direction provided by *Sound Move* has resulted in a unique type of transit service in the Central Puget Sound region. ST Express routes are designed to provide fast, point-to-point public transportation using direct paths between major activity centers. The activity centers served by ST Express function both as trip destinations and as connection points to other bus and rail lines. ST Express routes respond to a dispersed regional development pattern that requires faster, more competitive travel times and convenient connections to access the region's multiple activity centers.

These service design guidelines were developed so that Sound Transit bus service reflects the operating parameters and service characteristics described in *Sound Move.* They also provide service design continuity so that the system is more easily understood and communicated to the public. The guidelines are indications of general policy and are not intended to be a set of rigid design standards. They should be applied on a case-by-case basis with consideration of the many factors that determine the optimum service design.

Changes to Service Design Guidelines since the 1999 Edition

All-day, 2-way service: Since the first edition of the Service Standards was approved, all of the planned *Sound Move* bus routes have been implemented. In general, the system reflects the regional express service characteristics described in the original *Sound Move* plan. However, in some corridors, the objective of two-way, all day service has not been achieved due to limited demand or lack of resources. In other corridors, peak period demand has been higher than expected, so resources originally intended for off-peak service have instead been used to address peak period commuter needs.

To reflect these realities, the Service Design section of the Service Standards no longer requires existing ST Express routes to provide all day, 2-way, seven-day-a-week service. Peak directional routes and routes with limited spans of service will be evaluated using the same performance indicators and rating system as other ST Express routes.

"Direct Express" and "Local Express": The original Service Standards described two tiers of ST Express service: "Direct Express" routes and "Local Express" routes. "Direct Express" routes were defined as routes that stop at two or a limited number of locations to provide fast, direct trips during peak demand times or between locations where a high level of demand exists. "Local Express" routes were defined as routes that stop at all or nearly all Primary and Secondary Transit Centers along its path. The "Locals" were intended to provide service to lower demand locations and during low demand periods.

In practice, routes were implemented that had both "Direct Express" and "Local Express" characteristics, making it impossible to classify individual routes. In addition, the term "Local Express" appears contradictory and could result in confusion over the role of ST Express in the regional transit network. As a result, these categorizations have been deleted in this edition of the Service Standards.

Changes to Guidelines for Route Deviations: The formula used to evaluate proposed mid-route route deviations has been changed to provide more flexibility. Deviations of up to 10 minutes will be considered if the number of boardings and alightings along the deviation equals 50% or more of the through passengers. Deviations of less than 10 minutes will require proportionately fewer boardings to meet the criteria (see Section 7).

Service Design Guidelines

1. Routing on Streets and Highways

ST Express routes should operate on High Occupancy Vehicle (HOV) lanes wherever possible in order to minimize travel times and improve on-time performance. Other improvements such as special HOV ramps connecting limited access highways with transit centers and park-and-ride lots should also be utilized where available. When operating in mixed traffic, ST Express routes should use designated state route limited access highways and major regional arterials. Operation on secondary arterials and collector/distributor streets should be avoided except when needed to access transit/HOV facilities, significant travel destinations, or turnaround loops.

2. Key Transfer Points

Vital to the success of the ST Express is the ability for passengers to access these routes from the other transit systems in the Sound Transit service area. At key transit centers, connections between ST Express routes and local routes will be coordinated to the maximum extent feasible. Dwell time standards will be used for mid-route transfer points (see Section 11, Schedule Efficiency). Schedules for ST Express routes should be designed to minimize connection times at the key transfer points where significant numbers of transferring passengers access ST Express service. Where more than one such location exists on an ST Express route, it may not be possible to provide direct timed transfers at all locations. A number of techniques should be explored to minimize waiting times in these situations, including:

- Prioritizing each location based on actual or projected number of boardings and alightings.
- Offsetting the ST Express route schedule to equalize the transfer waiting times at multiple transfer locations.
- Providing more frequent service, such as 15-minute headways or better, at key times when transfer volumes are greatest.
- Other types of schedule coordination.

If these or other scheduling techniques are not feasible, then as a last resort the possibility of modifying the transit center pulse times should be explored with the local operator. This would normally be a consideration when all, or nearly all, of the schedules serving the transit center in question are based solely on the transit center pulse times.

3. Service Span

The service span, or the hours of operation of an individual route, should be based on demand and relate to the operating times of the activity centers being served and the service span of the connecting local transit system. Some routes may operate only during weekday peak periods while others may operate all day, seven days a week. Other routes may operate all day on weekdays but provide no weekend service. As a general guide, three levels of service are defined for different operating time periods:

- *Peak service* is generally between the hours of 6:00 a.m. and 9:00 a.m., and between 3:00 p.m. and 6:00 p.m.

- *Base service* is provided in the early morning from 5:00 a.m. and 6:00 a.m., in the mid-day period between 9:00 a.m. and 3:00 p.m., and in the early evening period between 6:00 p.m. and 8:00 p.m. on weekdays, and between 6:00 a.m. and 6:00 p.m. on Saturdays.

- *Reduced service* is between 8:00 p.m. and midnight on weekdays, from 6:00 p.m. to midnight on Saturdays and from 6:00 a.m. to midnight on Sundays. Reduced service is also operated on some holidays.

Service may be provided outside of these hours if there is a reasonable probability that expected ridership will maintain or increase overall route productivity, using the performance indicators described in the "Service Evaluation and Adjustment Process."

4. Route Headways

Headways are the time intervals in minutes between scheduled trips. Both policy and demand determine a route's headways. Since ST Express is a high capacity "core" network of regional routes, the use of maximum policy headways helps to preserve system integrity. A route is generally not attractive to a large part of its potential market if headways are too infrequent, and a 30-minute headway or better is highly desirable to keep transfer waiting times reasonable for potential connections at key transfer points. Maximum policy headways are listed below.

Period of Service		
Peak	Base	Reduced
30 minutes	60 minutes	60 minutes

Generally, 60 minutes is the maximum headway that should be operated. However, there may be isolated situations where less frequent service may be appropriate due to financial constraints or when trips are needed to serve travel demand outside of regular service hours.

Headways should conform to regularly recurring clock intervals, and should therefore be a multiple of 60, i.e., 15, 20, 30, or 60. This will assist in the scheduling of regular timed transfers between ST Express routes, and between ST Express routes and local routes.

Once service is in place, headways may be reduced (more frequent service provided) if route productivity consistently exceeds the system average or if passenger loads exceed ST Express loading standards. (See Service Evaluation and Adjustment Process)

5. Directness of Travel

One of the unique aspects of ST Express is that it provides relatively fast service between major origins and destinations throughout the three-county service area. At certain times and in some locations where HOV lanes are provided, travel times between consecutive stops are less than that of a single-occupant automobile. However, most ST Express routes will have stops between major generators that will tend to increase end-to-end travel times. Therefore, it cannot be expected that all routes provide non-stop direct service between major generators with travel times equal or better than an automobile. In order to increase average transit speeds, the Washington State Department of Transportation and local jurisdictions are encouraged to provide priority treatments for High Occupancy Vehicles (HOV's) whenever possible.

The "Coefficient of Directness" is computed by dividing the travel time by transit between two major generators by the travel time by automobile between the same two locations. This should not exceed 1.33 for ST Express routes.

6. Deviations

Mid-route deviations that cause a route to backtrack, or significantly deviate from the most direct route between major travel generators, should be avoided. In some instances, a deviation is warranted because of potential ridership gains. In evaluating a proposed deviation it should be determined that the total additional travel time for all through passengers should not exceed ten minutes for each boarding and alighting along the deviation. This is expressed in the following formula:

$$(Pt * T)/Pd \leq 10 \text{ minutes}$$

Pt = Number of through passengers
T = Addition vehicle travel time
Pd= Number of boardings and alightings on the deviation

7. Short Turns

Routes that experience a significant drop in demand at a certain point should be considered for short turns. Short turns are selected trips scheduled to turn around before reaching the end of the route, thus providing more capacity on the segment of the route with the greatest demand. Since the objective for employing a short turn on a route is a more efficient utilization of resources, it should not result in excessive layover.

8. Duplication of Service

Outside of major activity centers, operation of more than one route on the same street or a closely parallel street should be avoided except where there is a high level of demand or HOV lane or special transit priority treatment. Schedules of routes operating on the same street should be coordinated to optimize service headways where feasible.

9. Route Anchors

Major trip generators located at the end of a route have a positive affect on ridership and can "anchor" the route's terminal at a logical location. Routes should be scheduled to serve peak passenger demand at these locations.

10. Route Terminals and Layover Areas

Identifying a satisfactory bus layover location at a route terminal can be the most challenging aspect of designing a new ST Express route or modifying an existing one. Capacity for layover should always be evaluated when considering service changes that affect route terminals. Existing off-street layover facilities should be identified and used to the greatest extent possible, and bus layover needs should be addressed during the design process for new transit capital projects such as transit centers, rail stations and park-and-ride lots.

11. Schedule Efficiency

When developing schedules, the amount of time allocated for layover should be a minimum of 15 percent of the total cycle time. A reasonable amount of additional layover time may be provided as necessary to achieve clock headways. If it results in a lower vehicle requirement and does not compromise schedule adherence, layover time can be reduced to between 10 and 15 percent of total cycle time. Layover should be avoided at locations where through passengers are expected.

Dwell time at intermediate stops should be kept to the minimum time needed for passengers to board and alight. Scheduled waiting should occur only for major pulse times at major transit centers if five minutes or less. Local operators should be encouraged to schedule routes to minimize dwell times at mid-route transfer locations. The predominant directional orientation of passengers should be considered in efforts to minimize mid-route dwell time.

12. Rail-Bus Integration

ST Express routes should connect with commuter rail and light rail lines when there is a benefit to passengers in terms of travel time, reliability and/or improved multi-destinational transfer connections.

While Sound Transit is not responsible for planning local bus service, it strongly urges partner transit agencies to develop bus route networks that optimize connections with Sounder commuter rail and Link light rail especially when such changes improve system productivity and provide a net benefit to passengers in terms of travel time, frequency of service, transfer connections and reliability.

13. Bus Stop Spacing

By definition, express routes make limited stops compared with local transit routes. Passenger stops for ST Express routes should be limited to transit centers, major transfer points and park-and-ride lots. Other stop locations may be considered on a case-by-case basis, but at a minimum, each stop should have at least 25 daily boardings. In downtown Seattle and similar activity centers with very high demand, there can be several closely-spaced stops to avoid sidewalk overcrowding and provide increased geographic coverage.

The selection of ST Express stops should also take into consideration the availability of local transit service on the corridor, the presence of major trip generators along the express route, the location of transfer points with local routes, and the availability of transit-only or HOV lanes, or other facilities that have the potential to increase operating speeds. Since a relatively small portion of the bus stops that exist in the Sound Transit service area will be used for ST Express routes, these stops should be clearly marked as locations where passengers may access this system.

14. Minimum Passenger Amenities

Since ST Express routes provide connections with local bus systems, it is expected that many passengers will be transferring. Also, the relatively high passenger volumes at ST Express stops make them strong candidates for passenger amenities. At a minimum, all stops in the peak boarding direction should have bus shelters or other means of weather protection for passengers where feasible. Schedule information for ST Express routes should be displayed at all stops in the peak boarding direction.

C. SERVICE EVALUATION AND ADJUSTMENT PROCESS

Changes to Service Evaluation and Adjustment Process since the 1999 Edition

Trial Period for New Routes: Ridership on new routes should reach 100 percent of projections after a two-year trial period, rather than 60 percent (see Section 7).

On-Time Performance Review: The performance benchmarks for on-time performance have been expanded to include departure times from the start of a route, departure times from mid-route time points (except estimated time points), and arrival times at outer route terminals (see Section 10).

New productivity indicator: The route-level performance ratings in the first edition of the Service Standards used three productivity indicators: boardings per revenue hour, boardings per trip, and fare revenue/Operations and Maintenance (O&M) cost ratio. In practice, the fare revenue/O&M cost ratio measure has not been used in the service evaluation process because accurate fare revenue data is not available at the route level. Only the boardings/hour and boardings/trip indicators have been used to rate individual routes. This edition of the Service Standards replaces the fare revenue/O&M cost measure with another indicator, purchased transportation cost per boarding (see Section 12).

Title VI Evaluation: As part of the annual Service Implementation Plan (SIP), Sound Transit will assess the impact of proposed service changes on minority communities and populations in accordance with Federal Transit Administration Title VI requirements (see Section 14).

Special Bus Service: A new section addressing the criteria for special bus service has been added (see Section 15).

1. Service Changes

Changes to ST Express service generally occur in one of two ways:

Service Implementation Plan: The annual SIP, contains staff recommendations for major service changes to be implemented during the upcoming calendar year. Changes at the SIP level may have significant customer and budget impacts, and the SIP is developed on a set schedule in lockstep with the agency budget. SIP recommendations are based on the completion of new transit facilities, major changes in passenger demand patterns, and the performance of individual routes as defined in the Service Standards. Feedback from board members, local jurisdictions, other transit agencies or stakeholder groups may be incorporated into the final SIP recommendations. The SIP requires Sound Transit Board approval for implementation.

Administrative Service Changes: Minor service changes may be approved and implemented at the staff administrative level. Changes that can be made administratively include:

- Any single change, or cumulative changes, in a service schedule that affects the established weekly service hours for a route by 25 % or less.
- Any change in route location which does not move the location of a stop by more than a half mile.

- In the presence of an emergency which requires change to established routes or schedules or classes of service not meeting the above criteria, the Chief Executive Officer may implement such change for the necessary period of time or until the Sound Transit Board can establish a timeframe.
- Other routes, such as tripper service, limited, special and other types of transit routes, may be established by the Chief Executive Officer, consistent with annual appropriations and the most current SIP.

Typically, administrative service changes are implemented to address a near-term operational issue, such as passenger overloads, on-time performance, transfer connections or traffic revisions that affect routing. Feedback from customers, local jurisdictions, other transit agencies or stakeholder groups may result in service changes that are implemented administratively. Administrative changes are generally implemented at a regular tri-annual service change date when drivers change assignments and timetables are reprinted; however, they may be implemented at other times depending on individual circumstances.

2. Service Implementation Plan

The annual SIP, described in Section 1, is the cornerstone of the ST Express system's on-going service adjustment process. It identifies recommended service modifications for the upcoming year based on changes in travel patterns, route performance and the application of the Service Standards. It includes a route-by-route report on the status of the system, an evaluation of the services provided, recommended changes to the current routes, and performance objectives in the upcoming year, including ridership and productivity targets. The types of changes proposed will range from minor alignment or schedule adjustments to new or restructured routes. The initial version of each year's SIP will be issued as a draft. Changes may be incorporated during the Sound Transit Board review process. Sound Transit Board approval is required for implementation of the service changes included in the SIP.

3. Comprehensive Operational Analysis

At least every five years, Sound Transit will conduct a Comprehensive Operational Analysis (COA) of the ST Express system. This will involve a detailed analysis of ridership patterns and system operations. It will include on/off passenger counts of every trip on each route separately for weekdays, Saturdays, and Sundays. A running time analysis and schedule adherence check will also be performed. Five-year ridership trends will be reviewed on a systemwide and individual route basis. The COA may include other market research activities as appropriate such as on-board passenger surveys, telephone household surveys, and demographic analysis.

4. Ongoing Analysis and Evolution

In addition to the COA process, an ongoing analysis of schedule efficiency and ridership will be conducted. This evaluation may result in minor adjustments to schedules, elimination or addition of individual trips based on demand, schedule interlining changes, and other minor changes identified by drivers, schedulers and other operations personnel. In general, changes at this scale can be implemented administratively without Sound Transit Board action (see Section 1).

5. Evaluation of Service Requests

Requests for new service and service changes will be evaluated in a systematic way to ensure compliance with the Service Standards. If it appears that a proposal is consistent with the Service Standards, it will move to the Comparative Evaluation phase (see Section 6).

6. Comparative Evaluation

In conjunction with the annual SIP, a comparative evaluation of proposed new routes, service additions or deletions, and proposed route changes will be conducted to determine the optimum use of available resources. In this phase of the service evaluation process, it is determined whether the resources used for poorly performing routes would be better utilized to improve service on routes exceeding passenger load standards, those with high ridership levels, or others that are not achieving the on-time performance standard. Proposed new routes, service requests and other service modifications will also be considered in the comparative evaluation phase of the process. Proposals that score well in this process will be candidates for inclusion in the Draft SIP.

7. Trial Period for New Routes

The trial period for new routes is 24 months in duration. At 24 months, a new route should reach 100 percent of the ridership levels projected at the beginning of the trial. New routes will then be evaluated using the same performance measures as established routes. In conducting this evaluation for new routes that fall in the poor performing categories for two or more measures, ridership trends will also be considered.

8. Percentage of Scheduled Trips Operated

Systemwide, an average of 99.8 percent or more scheduled trips should be operated as shown on the published timetable during each quarter and calendar year.

9. Passenger Load Guidelines

Ideally, a seat should be available for every ST Express passenger during all periods of operation. However, this is not always possible because of funding constraints or limited vehicle or driver availability. The purpose of load guidelines is to ensure that most passengers will have a seat for at least the majority of their trip. The maximum average load factor is calculated by dividing the total number of passengers passing the maximum load point by the number of seats passing the maximum load point during the operating period being considered. As a guideline, the average load factor during the operating period should not exceed 1.0. Since this is an average, individual trips may exceed the guideline. For individual trips, load factors greater than 1.0 should not be exceeded for time periods greater than 15 minutes or for more than two consecutive stops, whichever is longer.

These guidelines may be relaxed during temporary surges in demand or for special event service.

10. On-Time Performance Review

A key success factor for ST Express is providing convenient and reliable transfers together with schedules the public can depend on. In order to identify routes with serious on-time performance issues, Sound Transit will conduct an annual comprehensive assessment of on-time performance using automatic passenger count data samples together with spot on-street monitoring. The assessment will be based on data collected over at least one service change period. The results of the assessment will allow Sound Transit to rate each route for on-time performance and prioritize where schedule maintenance hours and other actions that improve on-time performance should be focused. Guidelines for on-time performance are listed below. The routes with performance below the levels shown will be candidates for corrective action.

On-Time Performance Guidelines

- 90% of bus trips on each route should depart the route terminus not more than three minutes late and never early.
- 85% of bus trips on each route should depart each mid-route scheduled time point not more than five minutes late and never early, except for estimated time points, where buses are allowed to depart early.
- 90% of bus trips on each route should arrive at the route terminus not more than seven minutes late.

Note: These guidelines are distinct from the standards included in the current 2005-2009 service agreements with the partner transit agencies. They are intended to assist Sound Transit in prioritizing schedule maintenance efforts. They do not change the on-time performance reporting requirements called for in the agreements.

11. System Productivity and Effectiveness

As part of the annual SIP and Sound Transit budget process, goals are established for ST Express ridership, productivity and effectiveness each calendar year. The Transportation Services Department's *Service Delivery Quarterly Performance Report to the CEO,* available at www.soundtransit.org, provides a regular "snapshot" of Sound Transit's progress in meeting these goals.

12. Route-Level Productivity Ratings

The route-level productivity and effectiveness review is intended as a planning tool to rate individual ST Express routes. Routes are rated by comparing their performance in three key areas with the performance of the ST Express system as a whole. The objective is a quantitative, first level screening process to flag service that may be reducing system productivity and that may require remedial actions. Routes consistently performing well below average could be subject to a number of actions, including frequency reduction, service span revision, realignment, rescheduling, route consolidation or other restructuring, extensive marketing efforts, or deletion. Conversely, routes with a consistent above-average performance may be candidates for additional trips or other actions that increase service levels and capacity.

It should be emphasized that the route effectiveness ratings are only one of several tools used in the service evaluation process. Other factors, such as system integration, the length of time service has been operating and service to transit-dependent populations may be considered by Sound Transit staff and board members in making decisions about service.

a. Performance Indicators

For purposes of the SIP route rating process, productivity and cost effectiveness will be assessed using these three performance indicators:

- Boardings per revenue hour
- Boardings per trip
- Purchased transportation cost per boarding.

Boardings per revenue hour is the number of passengers boarding a vehicle during one hour of scheduled revenue service, not including vehicle deadhead or layover time.

Boardings per trip are the number of passengers boarding each scheduled one-way trip.

Purchased transportation cost per boarding is the cost Sound Transit pays the partner transit agencies for bus operations and maintenance, divided by the number of boardings. The purchased transportation cost is not the full cost of the service, but it represents about 88 percent of the total and is the only major cost that can be allocated accurately at the route level. The purchased transportation cost represents the combined rate of the three partner transit agencies weighted for the percentage of service each agency operates.

b. Frequency of Route-Level Review

All ST Express routes will be rated for productivity and effectiveness at least once a year, and the results will be included in the annual SIP. Data from at least one full quarter will be used to calculate system performance and the performance of individual routes. Routes will be rated more frequently if ridership trends are consistently negative, special requests for service are received, or other special circumstances are noted.

c. Ratings by Time Period

Ratings will be calculated for each of the following time periods:

- All periods of route operation combined
- Weekday only
- Saturday only
- Sunday/Holiday only.

d. Productivity Ratings

There are four productivity and effectiveness ratings for ST Express routes:

Good

- Service performs at 125% or more of the system average in passengers per trip and passengers per revenue hour.
- Service performs at 75% or less of the system average in purchased transportation cost per boarding.

Satisfactory

- Service performs at 100-125% of the system average in passengers per trip and passengers per revenue hour.
- Service performs at 75-100% of the system average in purchased transportation cost per boarding.

Marginal

- Service performs at 75-100% of the system average in passengers per trip and passengers per revenue hour.
- Service performs at 100-125% of the system average in purchased transportation cost per boarding.

Unsatisfactory

- Service performs at less than 75% of the system average in passengers per trip and passengers per revenue hour.
- Service performs at 125% or over the system average in purchased transportation cost per boarding.

e. Methodology

Each performance rating is assigned a number:

- **1** for Good
- **2** for Satisfactory
- **3** for Marginal
- **4** for Unsatisfactory

These numbers are used to calculate the performance score for individual routes in a process similar to that used for calculating academic grade point averages.

The following steps are used to calculate the combined performance rating of individual routes:
A route's performance in each of the three indicators is compared with the system average and given a numerical score. As an example, compared with the system average, Route 599 has "Good" performance in rides/revenue hour (1), "Good" performance in rides/trip (1) and "Marginal" performance in purchased transportation cost/boarding (3). The scores are added together for a total of 5. This number is divided by 3 (the number of performance indicators) to produce a final numerical score, 1.67, a "Satisfactory" rating. The lower the number the better the overall performance, as shown in the following table:

Performance Rating	Numerical Score
Good	1.0-1.5
Satisfactory	1.5-2.5
Marginal	2.5-3.5
Unsatisfactory	3.5 or above

f. Secondary Screening

Following the initial ratings, routes with "Marginal" or "Unsatisfactory" performance will undergo a more detailed service evaluation that includes an assessment of productivity and effectiveness by time of day, at the trip level and by route segment.

Routes that rate "Marginal" or "Unsatisfactory" for a period of two years or more may be candidates for actions to improve productivity and cost effectiveness. Types of actions that could be considered include marketing/promotion programs, selective deletion of unproductive route segments or trips, complete restructuring or complete discontinuance of the route.

Routes that rate "Good" or "Satisfactory" for a period of two years or more will be candidates for service enhancements if resources are available, particularly if performance has shown a consistent upward trend.

13. Other Productivity Considerations

In some instances, it may be in the public interest to maintain a poorly performing route or route segment in order to meet a special objective for the system. For example, an ST Express route may provide the only transit access to a vital social service facility. Also, new development or transit facilities that are likely to generate ridership can also be considered. This could include new shopping centers, offices or other employment sites, park-and-ride lots, and HOV lanes or ramps.

14. Title VI Evaluation

Pursuant to Title VI of the Civil Rights Act of 1964 and applicable state and local laws, no person shall be subjected to discrimination on the basis of race, color or national origin in any program or activity performed by or provided for Sound Transit. As part of its annual Draft SIP, Sound Transit will assess the impacts of proposed service changes on minority transit users and communities using methodology approved by the Federal Transit Administration.

15. Special Bus Service

A key objective of the *Sound Move* plan is improving regional mobility for a variety of trip purposes, including school, shopping and recreation (Regional Transit System Plan, page 10). If special service helps to achieve a significant transit mode share at a major event, the service provides a public benefit by relieving pressure on major highways and parking facilities near the event venue (*Sound Move*, Appendix C, page C-12).

"Special service" is distinct from "extra service," which is service added to regular routes to prevent overloads during major events. Extra service is needed when an event is expected to generate so much demand that more bus trips are needed on regularly-scheduled routes. Sound Transit's transit agency partners generally make the decision on whether to operate extra service based on the size of the event and previous experience. The cost of the extra service is included in the agency budget for ST Express.

Special bus service is generally a one-time service designed to transport passengers directly to an event venue and operates only during the specific time periods when the event is generating travel demand. Special service may have the side effect of reducing overcrowding on regular service if the event venue is served by established ST routes. Provisions in Sound Transit's service agreements with the partner transit agencies allow special service to be operated subject to the availability of buses and drivers. Any consideration of special bus service is subject to the availability of budgetary resources; meeting all criteria does not guarantee that Sound Transit will provide service.

To be considered for special bus service, events must meet these essential criteria:

- The event must be open to the broad, general public.
- The event venue must be located within the Sound Transit service area.
- The event service must have a feasible operations plan, including adequate bus and driver availability, passenger loading and bus layover space near the venue, and assigned road supervisors.
- The event service must achieve productivity equal to or better than the system average.
- The event service must be approved by the appropriate transit partner agency.

In addition to the essential criteria above, events with the following characteristics will be given preference for special service:

- The event service is likely to cover a significant portion of its direct cost through fares, subsidies from outside parties, in-kind contributions, promotional trades or a combination of these sources.
- The event service mitigates congestion on regional highways and reduces parking requirements in the vicinity of the event venue.
- Buses are given priority over other traffic to access the venue.
- The event service reduces passenger overloads on regular Sound Transit train and bus service.
- The event service attracts new customers, promotes Sound Transit, generates positive media coverage and community goodwill.

SOUNDER COMMUTER RAIL SERVICE STANDARDS

A. SOUNDER SERVICE CONCEPT

Sound Move introduced commuter rail as a new mode of public transportation in the Central Puget Sound region. Commuter rail utilizes existing railroad lines to provide high-capacity rail passenger service during peak travel demand times. Quoting from *Sound Move*, "Commuter rail builds on a railroad network already in place, increasing the transportation system's people-moving capacity and, by making necessary track and signal improvements, improving the capacity of those lines for other passenger and freight trains as well." Commuter rail provides dependable, on-time service since the tracks it uses have a high degree of grade separation and fully-protected at-grade road crossings with signals and crossing gates. In many cases, commuter rail provides a faster, more direct route between communities than parallel highway corridors.

Commuter rail trains have the ability to move large volumes of people. One car has seats for at least 145 passengers, and a seven-car train can carry over 1,000 passengers. Thus, each new train trip adds significant capacity to the system.

Using the brand name "Sounder," Sound Transit commuter rail service is provided on two lines: The **North Line** between Seattle and Everett, with one intermediate station at Edmonds, and the **South Line** between Seattle and Tacoma, with intermediate stations at Tukwila, Kent, Auburn, Sumner and Puyallup. As envisioned in *Sound Move,* an additional station is planned for the North Line at Mukilteo, and the South Line will be extended from Tacoma to Lakewood with an intermediate station at South Tacoma. Sounder currently operates on railroad tracks owned by BNSF Railway and Tacoma Rail. The extension from Tacoma to Lakewood will operate on tracks purchased by Sound Transit from BNSF and include about a mile of new track.

The focal point of the two Sounder lines is the King Street Station at the south end of downtown Seattle. The only Sounder station in Seattle, King Street, has very frequent connecting bus service to other parts of the downtown area and express bus connections to points throughout the region. Connections are also made at King Street with numerous employer shuttles and Amtrak intercity trains. Starting in 2009, Sounder passengers will be able to connect with Central Link light rail trains one block away at the International District Station.

At outlying stations, commuter rail depends heavily on park-and-ride lots to provide customer access to the service. Park-and-ride facilities are provided at all Sounder stations except King Street. All stations are also served by connecting bus routes and have bus loading and layover facilities. Sounder passes and tickets are valid for the base fare on all connecting buses.

B. SOUNDER SERVICE DESIGN

Compared with ST Express, the service design for Sounder commuter rail was largely defined in *Sound Move* and subsequent agreements with the host railroads. There is little flexibility to restructure the Sounder route network or adjust the total number of trains operated. The large investment in infrastructure, including stations and track and signal improvements, defines the routes, stops and the level of service that can be provided under the operating agreements with the host railroads.

With completion of programmed track and signal improvements, Sound Transit plans to operate a total of four weekday round trips on the North Line, and nine weekday round trips on the South Line, as called for in agreements with BNSF Railway. All trips on the North Line will operate during peak periods and in the peak direction (southbound in the morning, northbound in the afternoon). Additional service planned for the South Line includes "reverse peak" trains operating southbound in the morning and northbound in the afternoon, and a possible midday round trip. The BNSF agreement also allows for the operation of trains serving major events during off-peak times on both lines.

C. SOUNDER SERVICE EVALUATION AND ADJUSTMENT PROCESS

1. Service Changes

Changes to Sounder service generally occur in one of two ways:

Service Implementation Plan: The annual Service Implementation Plan (SIP), contains staff recommendations for major service changes to be implemented during the upcoming calendar year. Examples of changes at the SIP level are the addition or deletion of individual Sounder train trips or stations. SIP changes generally have a financial impact, and the SIP is developed on a set schedule in lockstep with the agency budget. SIP recommendations related to Sounder service are generally driven by the completion of new stations and progress on track and signal improvements. Feedback from board members, local jurisdictions, other transit agencies or stakeholder groups may be incorporated into the final SIP recommendations. The SIP requires Sound Transit Board approval for implementation.

Administrative Service Changes: Minor schedule adjustments and changes to train consists (lengths) may be implemented at the staff administrative level.

2. System Performance Report

The Transportation Services Department of Sound Transit publishes the quarterly *Service Delivery Quarterly Performance Report to the CEO,* which tracks progress in meeting the key Sounder service standard performance indicators described below. The report is available on-line at www.soundtransit.org.

3. Percentage of Scheduled Trips Operated

Systemwide, an average of 99.50 percent of all scheduled trips should be operated as shown in the published timetable during each quarter and calendar year.

4. On-Time Performance

Systemwide, an average of 95.0 percent of all scheduled trips should arrive at route terminals within seven minutes of the time shown in the published timetable, as recorded each calendar month.

5. Passenger Load Guidelines

Ideally, a seat should be provided for every Sounder passenger on all regularly scheduled Sounder trains. This is not always possible because of funding constraints or other factors limiting the ability to add capacity. The purpose of load guidelines is to ensure that most passengers will have a seat for at least a majority of their trip, consistent with the guidelines for ST Express and other express bus operators in the region. For Sounder, the guideline is to provide seats for all passengers traveling longer than 20 minutes. The following factors quantify these guidelines:

a. Peak Primary Load Factor: 0.90 passengers per seat weekly average of all trains passing the maximum load point in the peak direction in the peak hour.

b. Peak Secondary Load Factor: 1.0 passengers per seat weekly average on any single train passing the maximum load point in the peak direction in the peak hour except between station pairs less than 20 minutes apart.

These guidelines may be relaxed during temporary surges in demand or for special event trains.

6. System Ridership and Productivity

As part of the annual SIP and agency budget process, goals are established for Sounder system ridership and productivity each calendar year. The Transportation Services Department's *Service Delivery Quarterly Performance Report to the CEO,* described in Section 2 above, lists the ridership and productivity goals for the current year.

7. Trip-Level Ridership and Productivity

The Sounder service standards provide a process for objectively evaluating the productivity of individual Sounder train trips to better understand when remedial actions may be needed. Several potential actions could result from this evaluation. Train trips with consistent low productivity may be candidates for increased marketing, small scheduling adjustments to improve customer convenience, promotional fare discounts or other actions aimed at increasing ridership and productivity. Train lengths (consists) may also be reduced to decrease operating costs. Train trips with high average productivity and/or overcrowding may be candidates for a longer consist, small scheduling adjustments to spread demand or the implementation of a supplemental trip if feasible.

Since each Sounder train trip represents a large increment of both operating costs and passenger capacity, productivity ratings for Sounder focus on the *performance of each trip compared with the route average.* Each of the two Sounder lines have very different service areas, operating characteristics and service history; thus, a different approach is taken to evaluate the productivity of individual train trips on each line.

a. North Line Approach

- Do not implement a trip-level productivity evaluation process for the North Line at this time since the line is still in the start-up phase.
- Develop performance criteria and a rating system for the North Line in time to be used for the 2010 SIP or whenever all planned trains (excluding event trains) will have been in operation for at least two years. Line performance at this point in time will be considered the baseline for evaluating individual train trips.

b. South Line Approach

- Using the performance criteria and rating system described below, begin using the trip-level productivity evaluation process for the South Line starting with the 2010 SIP, or whenever all planned trains (excluding event trains) will have been in operation for at least two years. Line performance at this point in time will be considered the baseline for evaluating individual train trips.

- Establish lower performance criteria for shoulder, midday and reverse-commute trips, recognizing that they will have lower ridership and productivity than core peak-direction services and that in some cases they are necessary to position trains for peak-direction service.

c. South Line Trip-Level Productivity Evaluation

Three productivity criteria will be used to evaluate individual trips on the South Line when the trip-level evaluation process begins (as stated in above). These criteria are similar to those used for ST Express:

- Boardings per one-way train trip
- Boardings per revenue train hour
- Purchased transportation cost per boarding.

The performance of individual train trips will be compared with the average overall performance of the South Line. The rating categories and performance range for the first two criteria, boardings per one-way trip and boardings per revenue train hour, are shown in the following table:

Rating	Peak direction trip (% of line average)	Shoulder trip (% of line average)	Off-peak direction trip (% of line average)	Midday trip (% of line average)
Good	+125%	100-125%	+40%	+40%
Satisfactory	100-125%	75-100%	25-40%	25-40%
Marginal	75-100%	50-75%	10-25%	10-25%
Unsatisfactory	<75%	<50%	<10%	<10%

This table shows the rating categories and performance range for the purchased transportation cost per boarding criteria:

Rating	Peak direction trip (% of line average)	Shoulder trip (% of line average)	Off-peak direction trip (% of line average)	Midday trip (% of line average)
Good	<75%	75-100%	100-125%	100-125%
Satisfactory	75-100%	100-125%	125-150%	125-150%
Marginal	100-125%	125-150%	150-175%	150-175%
Unsatisfactory	>125%	>150%	>175%	>175%

d. Frequency of Review

South Line trips will be rated for productivity at least once per year beginning when all planned service is in operation, and the results will be included in the annual SIP. At a minimum, data from at least one full quarter but not more than one full year will be used to calculate line performance.

f. Methodology for Calculating Overall Ratings

Each performance rating is assigned a number:

- **1** for Good
- **2** for Satisfactory
- **3** for Marginal
- **4** for Unsatisfactory

These numbers are used to calculate the performance score in a process similar to that used for calculating academic grade point averages. Here is a hypothetical example: During the most recent quarter, the South Line achieved a "Good" rating in boardings per revenue hour (score 1), a "Good" rating in boardings per trip (score 1), and a "Marginal" rating in purchased transportation cost per boarding (score 3). The scores are added together for a total of 5. This number is divided by 3 (the number of performance indicators) to produce a final numerical score, 1.67, an overall "Satisfactory" rating. The lower the number the better the overall performance, as shown in the following table:

Performance Rating	**Numerical Score**
Good	1.0-1.5
Satisfactory	1.5-2.5
Marginal	2.5-3.5
Unsatisfactory	3.5 or above

8. Title VI Evaluation

Pursuant to Title VI of the Civil Rights Act of 1964 and applicable state and local laws, no person shall be subjected to discrimination on the basis of race, color or national origin in any program or activity performed by or provided for Sound Transit. As part of its annual Draft SIP, Sound Transit will assess the impacts of proposed service changes on minority transit users and communities using methodology approved by the Federal Transit Administration.

9. Special Train Service

A key objective of the *Sound Move* plan is improving regional mobility for a variety of trip purposes including school, shopping and recreation (Regional Transit System Plan, page 10). If special service helps to achieve a significant transit mode share at a major event, the service provides a public benefit by relieving pressure on major highways and parking facilities near the event venue (*Sound Move*, Appendix C, page C-12).

Special train service is a one-time or infrequent service designed to transport a large number of passengers directly to an event venue and operates only during the specific time periods when the event is generating demand. Provisions in Sound Transit's agreements with the operating railroads allow special trains to be operated on a limited basis, subject to crew availability and freight traffic constraints.

Special event trains, while having the ability to move large numbers of people efficiently, are expensive to operate and require a large operating, maintenance and security staff. To be considered for special train service, events must meet the essential criteria listed below. Any consideration of special train service is subject to the availability of budgetary resources; meeting all the criteria does not guarantee that Sound Transit will provide special service.

- The event must be open to the general public.
- The event venue must be located adjacent to a Sounder station or in downtown Seattle, where high-capacity transit connections are available between the King Street Station and the downtown area.
- The event service must carry at least 400 passengers per train trip.
- The event service must be authorized by the operating railroads.
- The event service must have adequate operating, maintenance and security staffing.

In addition to the essential criteria above, events with the following characteristics will be given preference for consideration:

- The event has definite start/finish times when the majority of attendees arrive and depart the venue.
- The event service covers a significant portion of its direct cost through fares, subsidies from outside parties, in-kind services, promotional trades or a combination of these sources.
- The event service mitigates congestion on regional highways and reduces parking requirements in the vicinity of the event venue.
- The event service reduces passenger overloads on regular Sound Transit train and bus service.
- The event service attracts new customers, promotes Sound Transit, generates positive media coverage and community goodwill.

TACOMA LINK LIGHT RAIL SERVICE STANDARDS

A. Tacoma Link Service Concept

In the Regional Transit Long-Range Plan, Tacoma Link is envisioned as the downtown Tacoma segment of a future Seattle-Tacoma light rail corridor. The current 1.6-mile stand-alone light rail line provides many present-day benefits for downtown Tacoma-- connecting five downtown neighborhoods with each other and with regional transportation services at the Tacoma Dome Station including Sounder commuter rail, ST Express buses and Greyhound. Tacoma Link also connects public parking throughout downtown including 2,400 spaces at the Tacoma Dome Station parking garage. Service is currently provided free of charge.

Tacoma Link operations are characterized by fast, efficient service, excellent on-time performance and frequent headways. Low-floor light rail cars allow level platform boarding, reducing dwell time at stations and facilitating access for passengers using wheelchairs. Cars have a large total capacity (56 passengers), but only have 30 seats due to the short trip length. Signal preemption and partial separation from other traffic makes it possible for Tacoma Link cars to complete the trip from one end to the other in only seven to eight minutes. Since the line is short, about half of its length (between Union Station/S.19th and Tacoma Dome Station) is single track to reduce construction costs and right-of-way impact. Signal systems prevent two trains from occupying the single track section simultaneously.

B. Tacoma Link Service Design

The service design for Tacoma Link was largely defined during the systems design process. There are five stations: Theater District/S. 9th; Convention Center/ S. 15th; Union Station/S. 19th; S. 25th Street; and Tacoma Dome Station. Compared with ST Express bus, there are few options for adjusting service levels or capacity. Stations require street right-of-way and are difficult and costly to add or relocate. Cars are single units that cannot be coupled together with other cars to form trains, and the single track section effectively limits the system to no more than two cars in operation at any one time. A 10-minute headway can be operated with two cars, while one car can provide a 20-minute headway during periods of lower demand. Thus, there are two options to change service levels: 1) Adjust headways (10 or 20 minutes), and 2) Adjust span of service (the time period that service operates).

C. Tacoma Link Service Evaluation and Adjustment

1. The Service Change Process

Changes to Tacoma Link service generally occur in one of two ways:

Service Implementation Plan: The annual Service Implementation Plan (SIP), contains staff recommendations for major service changes to be implemented during the upcoming calendar year. Changes at the SIP level may have significant customer and budget impacts, and the SIP is developed on a set schedule in lockstep with the agency budget. Examples of potential Tacoma Link SIP changes include any single change or cumulative change in schedules that affect more than 25 percent of weekly service hours and any permanent or long-term closure of a station or line segment. Feedback from board members, local jurisdictions, other transit agencies or stakeholder groups may be incorporated into the final SIP recommendations. The SIP requires Sound Transit Board approval for implementation.

Administrative Service Changes: Minor service changes may be approved and implemented at the staff administrative level. Changes that can be made administratively include:

- Any single change or cumulative change in schedules that affects the established weekly service hours by 25 % or less. This would include minor changes in trip times and partnerships with outside parties to extend the span of service for special events.
- Temporary closure of stations or line segments made necessary by construction, parades, emergencies or other situations expected to be short-term. Buses may substitute for light rail service during the closure.

2. System Performance Report

The Transportation Services Department of Sound Transit publishes the quarterly *Service Delivery Quarterly Performance Report to the CEO,* which tracks progress in meeting the key Tacoma Link service standard performance indicators described below. The report is available on-line at www.soundtransit.org.

3. Percentage of Scheduled Trips Operated

Systemwide, an average of 98.50 percent of all scheduled trips should be operated as shown in the published timetable during each quarter and calendar year.

4. On-Time Performance

Systemwide, an average of 98.50 percent of all scheduled trips should operate on schedule as shown in the published timetable during each quarter and calendar year. A trip is late if it either departs a terminal station more than three minutes late or arrives at a terminal station three or more minutes late and is unable to make its subsequent departure time.

5. Passenger Load Guidelines

Since one-way trip time is only seven to eight minutes, standees are permitted, up to the maximum car capacity of 56 passengers (30 seated plus 26 standee passengers). If standees regularly occur on five or more consecutive trips when 20-minute headways are scheduled, this will trigger a review of the existing schedule and available budgetary resources to determine if adjustments are necessary.

6. System Ridership and Productivity

The *Service Delivery Quarterly Performance Report to the CEO,* described in #2 in this section, includes the Tacoma Link ridership and productivity goals established in the Sound Transit budget for the upcoming calendar year.

7. Span of Service and Productivity by Time Period

As a planning tool to evaluate ridership and productivity, Tacoma Link service is segmented into time periods by time of day and day of the week. The productivity of the different time periods is compared against the system average and then rated according to specific performance criteria. The objective is a quantitative, first level screening process to flag service that may be reducing system productivity and that may require remedial actions. Time periods that consistently perform well below the system average could be subject to a number of actions including increased marketing, small schedule adjustments to improve customer convenience or service reductions (reduced span of service and/or 20-minute headways). Actions could also include a review of alternative services available to passengers during the time period and comparisons with bus service in the vicinity, reflecting both existing and potential new schedules. Conversely, time periods with high average productivity and/or overcrowding may be candidates for a longer span of service and/or 10-minute headways. The service span, or hours of operation, should be based on demand and relate to the operating times of the activity centers being served and the service span of the connecting transit systems.

a. Time Periods

For purposes of the SIP rating process, the following operating time periods are used:

- *Weekday Peak:* From 6:00 a.m. to 9:00 a.m. and from 3:00 p.m. to 6:00 p.m.
- *Weekday Midday:* From 9:00 a.m. to 3:00 p.m.
- *Saturday/Sunday:* From start of service to 6:00 p.m.
- *Early Morning/Evening:* Before 6 a.m. weekdays and after 6:00 p.m. any day
- *Holiday:* From 10:00 a.m. to 6:00 p.m.

b. Productivity Indicators

For purposes of the SIP rating process, productivity and cost effectiveness will be assessed using these three performance indicators:

- Boardings per revenue hour
- Boardings per trip
- O&M cost per boarding.

c. Productivity Ratings

There are four productivity and effectiveness ratings for Tacoma Link time periods. The rating categories and performance ranges for the first two criteria are listed in this section; boardings per revenue hour and boardings per trip are shown in this table:

Rating	**Wkdy Peak (% of system av.)**	**Wkdy Mid (% of system av.)**	**Sat/Sun (% of system av.)**	**Early AM & Evening (% of system av.)**	**Holiday**
Good	+150%	125-150%	100-125%	75-100%	75-100%
Satisfactory	125-150%	100-125%	75-100%	50-75%	50-75%
Marginal	100-125%	75-100%	50-75%	25-50%	25-50%
Unsatisfactory	<100%	<75%	<50%	<25%	<25%

This table shows the rating categories and performance ranges for the O&M cost per boarding criteria:

Rating	**Wkdy Peak (% of system av.)**	**Wkdy Mid (% of system av.)**	**Sat/Sun (% of system av.)**	**Early AM & Evening (% of system av.)**	**Holiday**
Good	50-75%	75-100%	100-125%	125-150%	125-150%
Satisfactory	75-100%	100-125%	125-150%	150-175%	150-175%
Marginal	100-125%	125-150%	150-175%	175-200%	175-200%
Unsatisfactory	>125%	>150%	>175%	>200%	>200%

d. Frequency of Review

Tacoma Link will be rated for productivity by time period at least once per year, and the results will be included in the annual SIP. At a minimum, data from at least one full quarter but not more than one full year will be used to calculate time period performance.

e. Methodology for Calculating Overall Ratings

Each performance rating is assigned a number:

- **1** for Good
- **2** for Satisfactory
- **3** for Marginal
- **4** for Unsatisfactory

These numbers are used to calculate the performance score in a process similar to that used for calculating academic grade point averages. Here is a hypothetical example: During the most recent quarter, the weekday midday time period achieved a "Good" rating in boardings per revenue hour (score 1), a "Good" rating in boardings per trip (score 1), and a "Marginal" rating in O&M cost per boarding (score 3). The scores are added together for a total of 5. This number is divided by 3 (the number of performance indicators) to produce a final numerical score of 1.67, an overall "Satisfactory" rating. The lower the number the better the overall performance as shown in the following table:

Performance Rating	**Numerical Score**
Good	1.0-1.5
Satisfactory	1.5-2.5
Marginal	2.5-3.5
Unsatisfactory	3.5 or above

8. Title VI Evaluation

Pursuant to Title VI of the Civil Rights Act of 1964 and applicable state and local laws, no person shall be subjected to discrimination on the basis of race, color or national origin in any program or activity performed by or provided for Sound Transit. As part of its annual Draft SIP, Sound Transit will assess the impacts of proposed service changes on minority transit users and communities using methodology approved by the Federal Transit Administration.

9. Special Service

A key objective of the *Sound Move* plan is improving regional mobility for a variety of trip purposes including school, shopping and recreation (Regional Transit System Plan, page 10). If special service helps to achieve a significant transit mode share at a major event, the service provides a public benefit by relieving pressure on major highways and parking facilities near the event venue (Sound Move, Appendix C, page C-12).

"Special service" is distinct from "extra service," which is service added during regular hours of operation to prevent overloads. Extra service is needed when an event is expected to generate so much demand that more trips are needed to supplement regular service. For example, a second Tacoma Link car may be placed in service when normally only one car is scheduled improving headways from every 20 minutes to every 10 minutes. Sound Transit is generally aware of the time periods when extra service is likely to be needed and budgets for it accordingly.

"Special service" in the context used here is a one-time or irregular service designed to transport passengers to and from an event venue outside of regular Tacoma Link service hours. For example, a large convention may be taking place jointly at the Tacoma Convention Center and the Tacoma Dome with activities scheduled for both venues until 11:00 p.m. Special Tacoma Link trips may be added after the regular service ends at 8:00 p.m. extending service until 11:00 p.m. or later.

Service outside of regular hours, while having the ability to move large numbers of people, is expensive to operate and requires longer hours for operating, maintenance and security staff, often working at overtime rates. To be considered for special service outside regular hours, events must meet the following essential criteria. Any consideration of special service is subject to the availability of budgetary resources; meeting all the criteria does not guarantee that Sound Transit will provide the service.

- The event service must be open to the general public.
- The event venue(s) must be located close to a Tacoma Link station.
- Productivity of the event service must be equal to or better than the system average.
- The event service must have adequate operating, maintenance and security staffing.

In addition to these essential criteria, events with the following characteristics will be given preference for special service:

- A significant portion of the extended service cost is covered by direct payments from outside parties, promotional trades or a combination of these resources.
- The event service mitigates congestion on regional highways and reduces parking requirements in the vicinity of the event venue.
- The event service reduces passenger overloads on regular Sound Transit train and bus service.
- The event service attracts new customers, promotes Sound Transit, generates positive media coverage and community goodwill.