

Public Transportation and Intercity Rail Passenger Plan for Washington State

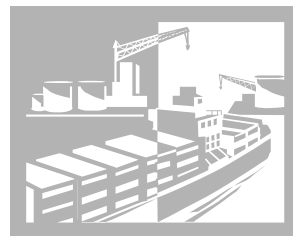
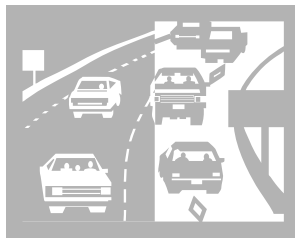
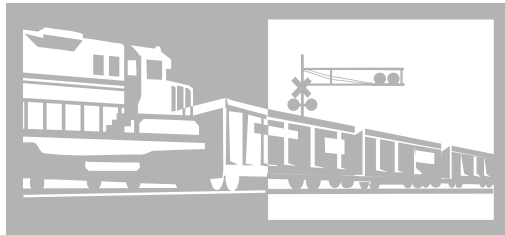
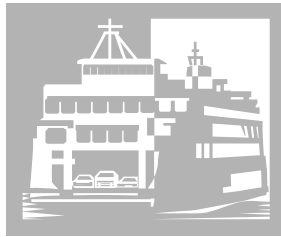
1997-2016



Washington State
Department of Transportation

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Executive Summary

What's in the Plan?

The *Public Transportation and Intercity Rail Passenger Plan for Washington State* is a 20-year plan for preserving our current public transportation systems while improving mobility for a growing population. The plan builds toward a future in which people have more public transportation choices, in which connections between modes are efficient and easy to use, and where state, local, private, and federal public transportation services are coordinated. The plan envisions people able to move through congested intercity corridors using a variety of transportation options, including intercity passenger rail — and proposes a sensible, incremental approach for achieving a service which is efficient, rapid, reliable, and safe.

The plan clarifies the state's role in public transportation, describes the present condition of public transportation in the state, and discusses significant issues. Then future needs are identified, realistic strategies are proposed for addressing those needs, and responsibilities for achieving them identified.

What is the State's Interest in Public Transportation?

The state is interested in increasing public transportation choices, in developing efficient and easy to use connections between modes, and in coordinating state, local, private, and federal public transportation.

The challenge lies in identifying the mix of services, facilities, and programs needed to develop choices, connections, and coordination — and in determining the costs, future financial resources, and defining the state, regional, and local responsibilities.

A Changing Partnership

Traditionally, transit has been considered a local responsibility while passenger rail has been managed at a national level. In reality, however, over the last 30 years, a complex partnership has evolved between federal, state, local governments, and the private sector. The nature of that partnership is changing as federal and state governments reevaluate their roles in supporting public transportation.

In 1992, at the direction of the Transportation Commission, the Washington State Department of Transportation (WSDOT) defined public transportation:

“ . . . a publicly supported system of services and facilities that provides an alternative to the single-occupant automobile and enhances mobility, environmental quality and appropriate land use patterns. Such systems may include any combination of services, facilities, and the necessary infrastructure related to transit, paratransit, ridesharing, intercity bus, airport shuttles, passenger rail, ferries, pupil transportation, high capacity transit, transportation demand management, people movers, bicycle and pedestrian programs.”

Of these components, the state of Washington owns the major ferries and now leases (and will eventually own) and operates passenger rail trains under contract with Amtrak. The state has no direct operational or maintenance responsibility for the other modes, but has an interest in preserving their existing services and infrastructure.

The State is Already a Partner

The partnership that already exists in regard to passenger rail trains is one reason for articulating the state's interest and responsibilities in public transportation. The state also provides grant programs, training, technical assistance, planning, and demonstration projects for public transportation.

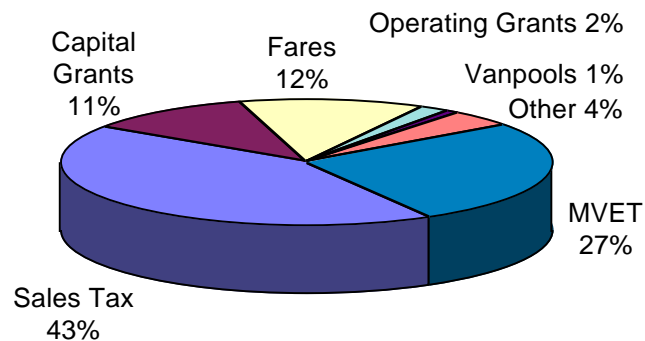
Public Investment in Transit

Another reason for articulating state interest and responsibility in public transportation is the level of public investment in transit. The state has an interest in ensuring that local improvements are responding effectively to growth pressures and legislative mandates and to the need for better intermodal connections.

In 1995, the 24 active public transit authorities had revenues of \$630 million. Over \$167 million — or 27 percent of the total transit revenues for 1995 — came from the share of the Motor Vehicle Excise Tax (MVET) that goes to the Public Transportation Benefit Areas (PTBAs).

1995 Transit Revenues

Total: \$630 million



What Are the Current Services?

The plan stresses the importance of preserving and maintaining investments already made in our public transportation system. This section describes the current public transportation services in Washington State in two stages: first, for public transportation except passenger rail; and second, for the intercity rail passenger system.

Public Transportation (Except Passenger Rail)

Public Transit Authorities

There are 24 public transit authorities in Washington State. In 1995, the transit service area population totaled 4,596,965 people. This means that 85 percent of Washington's citizens reside within the boundaries of a public transit provider. (See map of Transit Authorities on page viii.)

The majority of transit agencies provide fixed-route, demand-response (including Americans with Disabilities Act [ADA] service), vanpool, and ridesharing services and programs, and park and ride facilities. In 1995, approximately 137 million passenger trips and over 89 million passenger vehicle service miles were provided as part of fixed-route and demand-response services in urban and rural areas and through vanpool programs.

Paratransit

Paratransit service (i.e., specialized services for persons with disabilities, seniors, and the economically disadvantaged) is offered statewide through a variety of state, regional, and local programs. Several transit agencies operate and provide funding for paratransit service. The Department of Social and Health Services (DSHS) administers multiple transportation programs, the largest being the Medical Assistance Program. Numerous community-based paratransit services are also available and are sponsored by DSHS and local community programs.

High Capacity Transportation (HCT)

HCT systems are being planned for the four most populous and transportation congested areas of the state. The Regional Transit Authority (RTA) is planning a comprehensive system for the Puget Sound region. An extension of Portland's Metropolitan Area Express (MAX) system to Vancouver is being developed by 14 jurisdictions in two states, including C-TRAN, the transit provider in Clark County. In addition, Spokane and Thurston County are planning high capacity transportation systems.

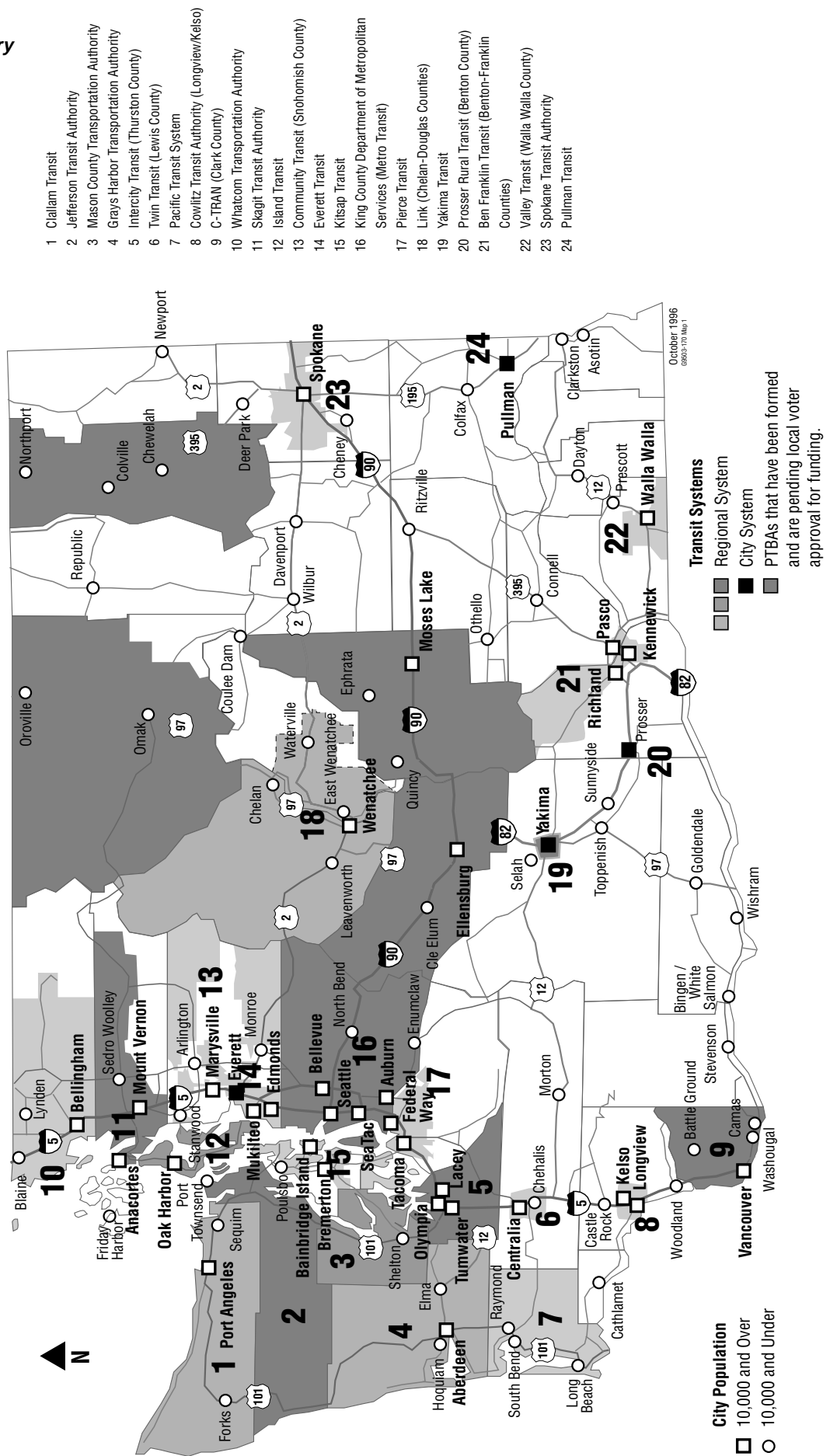
Transportation Demand Management (TDM)

TDM is a strategy for urbanized areas to deal with the problems of diminishing air quality and increasing traffic congestion. TDM programs promote the use of transit as well as the development of other alternatives such as ridesharing, telecommuting, teleconferencing, employee based incentives, and nonmotorized transportation.

WSDOT TDM programs include the Office of Urban Mobility's TDM Resource Center funded by money from the Intermodal Surface Transportation Efficiency Act (ISTEA); support for the regional ridesharing coordinators; the internal TDM program for employees; and some technical support for Commute Trip Reduction (CTR) and TDM in general.

Washington State Public Transportation

Transit Authorities



Park and Ride Lots

A recent state survey identified 262 state park and ride lots with a total of 30,345 spaces. During the 20-year planning period, an estimated additional 9,000 spaces will be needed. This estimate does not include the entire need for park and ride lots in Puget Sound, Spokane, and Vancouver, where it is anticipated they will be constructed and financed as part of high capacity transportation projects.

Intercity bus

Washington State is currently served by ten fixed-route (regularly scheduled service) intercity bus carriers which provide a critical link in Washington's public transportation network. (See map on page x.) They connect with many rail stations and transit providers and are important players in developing our state's intermodal facilities. The largest carrier, Greyhound Lines, operates a multitude of routes and schedules serving 15 terminals in the state.

Intercity Rail Passenger System

The Intercity Rail Passenger system links major population centers throughout the state. (See map on page x.) There are 14 stations statewide. Intercity rail passenger service is operated by Amtrak between Seattle and Vancouver, B.C.; Seattle and Portland; Seattle and Spokane; and Spokane and Portland on trackage owned by the Burlington Northern Santa Fe.

Current service between Seattle and Portland consists of daily round trip service with three trains: the *Cascadia*, the *Mount Adams*, and the *Coast Starlight*. Three days a week the *Pioneer* provides additional service. The *Cascadia* and *Mount Adams* are regional corridor trains offering a high degree of reliability. The *Coast Starlight* and *Pioneer* are long-haul trains with service to Los Angeles and Chicago. The long-haul trains often experience delays, causing unreliable service northbound toward Seattle.

Service between Seattle and Vancouver, B.C., consists of one daily round trip along Puget Sound with the *Mount Baker International*.

The *Empire Builder*, an Amtrak route from Chicago and Minneapolis, reaches Spokane daily. At Spokane, the *Empire Builder* service splits into two sections: the northern section extends to Seattle and the southern section to Portland.

Issues Facing Public Transportation and Passenger Rail

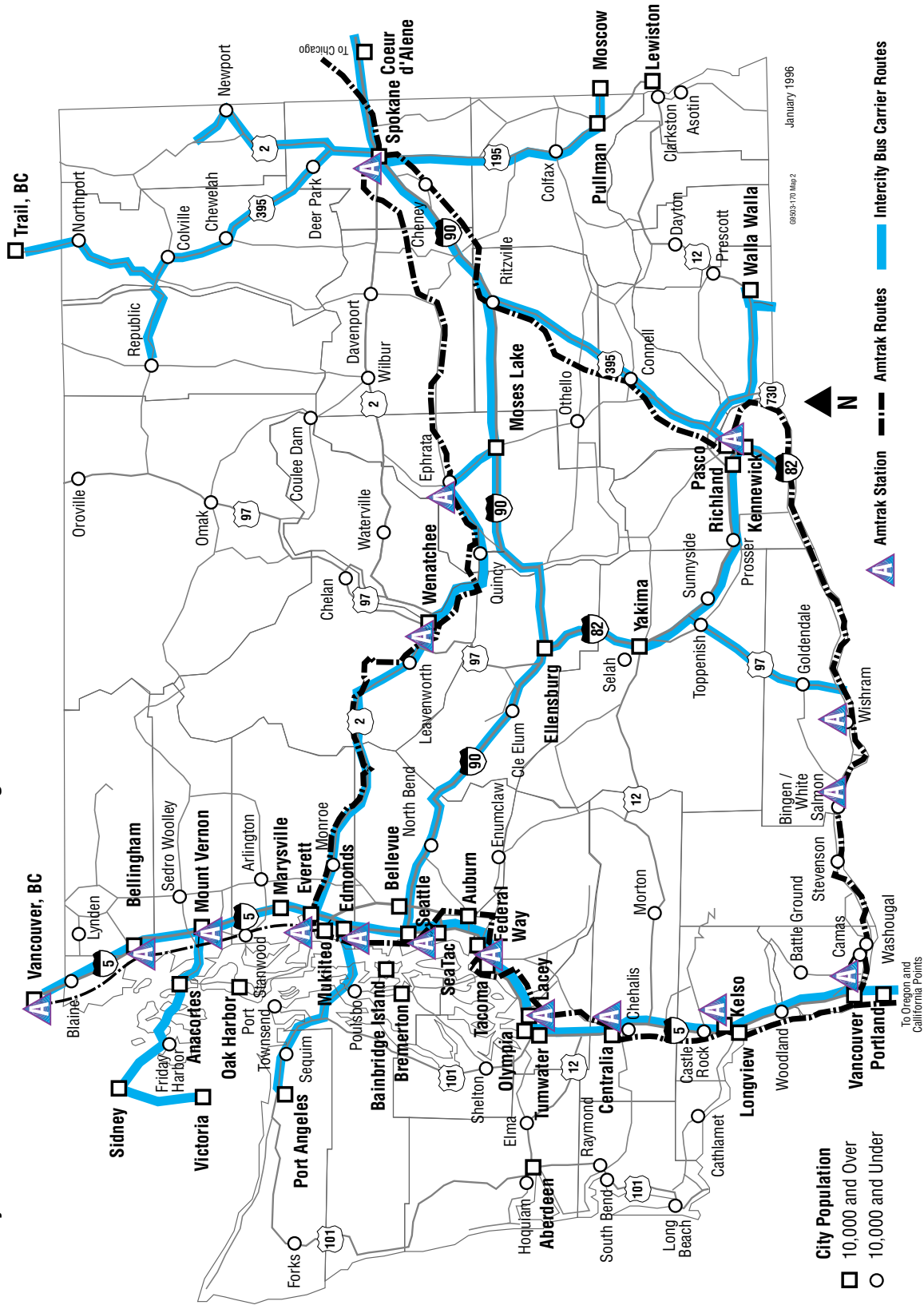
In the last 20 years, the mission for public transportation and passenger rail has expanded far beyond their traditional role. Public transportation and passenger rail are now expected to help eliminate congestion, stimulate economic development, protect the natural environment, and promote a positive quality of life for Washington's citizens.

We Need More Transportation Choices and Better Connections

Over the next 20 years, Washington State expects a growth of almost 2 million people. Intercity travel within Washington is expected to increase by 75 percent causing major intercity transportation corridors to grow even more congested.

Washington State Public Transportation

Intercity Bus Carrier Routes and Amtrak Passenger Rail Service



To keep people moving throughout the region — an essential component for maintaining economic vitality and quality of life — people must have travel choices and the various modes must connect.

Creating an integrated system will require physical facilities and scheduling, communication, and ticketing that permits passengers to move freely between the modes. Currently, however, connections between public transportation services are inconsistent and schedules are sometimes incompatible. Though progress has been made in this arena, significant barriers to efficient and convenient travel still exist.



To improve air quality while preserving open space through the coming years, land use planning must be linked to public transportation and passenger rail development. Furthermore, having rail passenger services in place would also enhance mobility through congested intercity corridors.

Service Delivery Should Be Coordinated

As the population grows, transportation access to community and social services in both urban and rural areas will be increasingly strained. A growing proportion of senior population will require more investment in specialized transportation services. A need already exists for coordination between agencies and programs — a need that will grow acute as budgets tighten.

Eleven state agencies participate in public transportation programs, often resulting in duplication and inefficient resource allocations. The current reality is that agencies operate within their own mandates, often supported by categorical funding sources that restrict opportunities to coordinate. Coordination is also hindered by multiple reporting and record keeping requirements. No single entity, other than possibly the legislature, is responsible and accountable for all transportation services.

How Can We Address the Issues?

To address the region's transportation issues, WSDOT developed a coherent vision of the future in which public transportation and passenger rail play a key role. This vision emphasizes preservation and efficiency while nurturing a wide variety of transportation options. The department has expressed this vision in *service objectives*, or specific, desired outcomes: 12 for public transportation and two for intercity rail passenger service.

Objectives for Public Transportation (Except Passenger Rail)

Preservation

- Preserve existing public transportation service levels.
- Preserve existing public transportation facilities and equipment.

Education and Technical Support

- Implement state-of-the-art public transportation management to ensure efficient and effective service delivery.
- Promote the use of public transportation.

Building Partnerships and Planning

- Build partnerships between federal, state, regional, local, and private sector public transportation entities to improve public transportation planning and coordinate service delivery.
- Address state public transportation policy in regional and local transportation plans.
- Facilitate the integration of public transportation in the land use development process, including the permitting and environmental impact processes.

Improvement

- Promote the development of some form of public transportation service in all areas of Washington State for use by the general public.
- Integrate public transportation services into a coordinated system linked by intermodal facilities.
- Improve mobility in small urban and rural areas.
- Public transportation providers will continue to meet ADA and state barrier-free design regulations and improve mobility for the special needs population.
- Improve and develop urban public transportation services, facilities, and programs, including as options HCT, HOV lanes, and Transportation Demand Management (TDM), to respond to growth, and to meet local and regional economic development, congestion, energy, and clean air objectives.

Objectives for Intercity Passenger Rail System

- Preserve and maintain existing service.
- Improve speed, frequency, reliability, and intermodal access of passenger rail service in the Pacific Northwest Rail Corridor (Portland-Seattle-Vancouver, B.C.) and improve the quality of rail service in other corridors statewide.

Action Strategies Provide the Framework

Chapter 5 contains the department's action strategies, the framework for achieving the service objectives identified above. The action strategies can be state actions or actions to be taken by others; the Financial Summary reflects the costs of these strategies.

Financial Summary

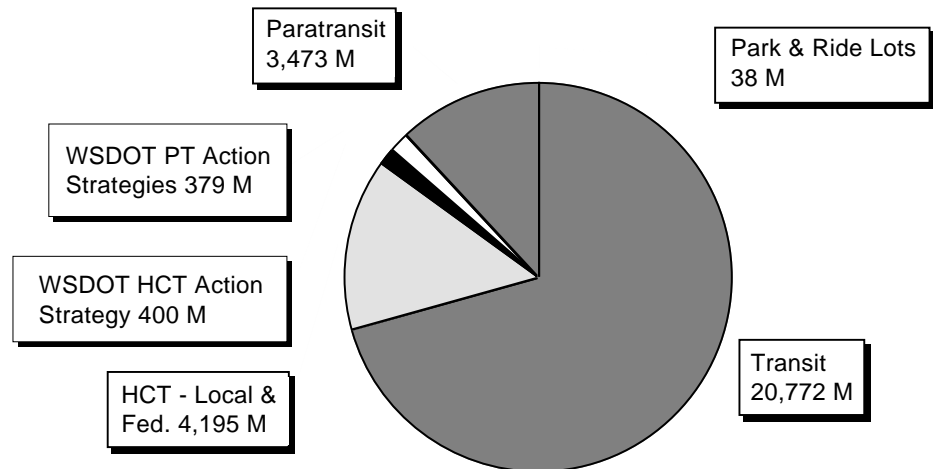
Public transportation revenue projections, like the needs projections, are based on the 20-year *Washington State Public Transportation Needs Assessment* completed in 1994. The needs assessment report focused on transit, paratransit, high capacity transportation, park and ride lots, and the WSDOT action strategies. The estimated needs and revenues have been updated for the planning period 1997-2016.

Needs for the Pacific Northwest Rail Corridor have been taken from the *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report*, published December 1995. Revenue projections for statewide passenger rail service integrate revenues projected in the *Options Report* with other WSDOT Rail Office studies.

Public Transportation (Except Passenger Rail)

Public transportation needs for the 20-year planning period total \$29.3 billion. This includes administration, estimated to be 10.65 percent of total cost. Cost for public transportation by mode or program are provided below.

Public Transportation 20-Year Costs



WSDOT Action Strategies total \$779 million.

Total public transportation revenues are projected to be \$17.9 billion for the 20-year planning period, leaving unfunded needs of \$11.4 billion. (If the historical trend of revenue increases were to continue, revenues could reach \$21 billion, leaving an unfunded need of approximately \$8.3 billion for the 20-year period.)

Transit expects to be 69 to 84 percent funded (depending on which revenue scenario is used) and paratransit is almost fully funded, but the other programs — WSDOT Public Transportation Action Strategies, high capacity transportation, and the park and ride lots — all have severe funding shortages.

The following table gives an overview of statewide public transportation unfunded needs by mode or program.

Financial Summary by Mode or Program (Millions of Dollars)				
Mode or Program	Needs	Revenues	Unfunded Needs	Percent Unfunded
Transit*	20,772	14,312	6,460	31.1
Paratransit	3,473	3,396	77	2.2
High Capacity Transportation	4,195	0	4,195	100.0
Park and Ride Lots	38	0	38	100.0
WSDOT Action Strategies	779	169	610	78.3
Total	29,257	17,877	11,380	38.9

*Revenues estimated by the transit agencies.

Intercity Rail Passenger Service

Total needs statewide for intercity passenger rail are projected to be \$2.9 billion for the 20-year planning period. The majority of needs are associated with the development of the Pacific Northwest Rail Corridor. The relatively small needs identified with the two east-west corridors, Seattle/Spokane and Spokane/Portland, relate to minor infrastructure improvements.

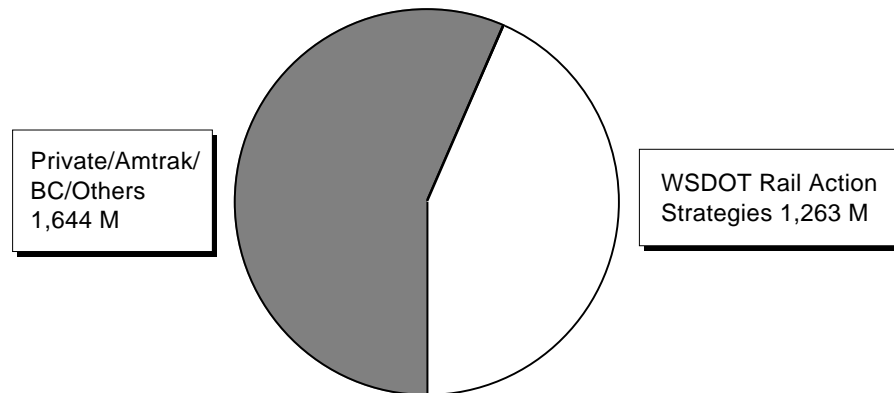
Currently, there is no dedicated funding for WSDOT’s Intercity Rail Passenger Program. Due to the short existence of the program, historical data are insufficient to establish a trend. During the 1995-1997 biennium, \$36 million has been budgeted for the program. However, because no future budget level has been set, no reliable revenue figures can be projected.

At present, the only revenues that may be projected are from fares and food and beverage concessions. As the state’s contracted operator, Amtrak collects these revenues; they are credited against the cost of service. Continuing existing service would generate revenues of \$85 million while enhanced service is expected to bring in additional revenues of \$491.8 million.

Statewide Intercity Rail Passenger (Millions of Dollars)				
Category	Costs	Revenues	Unfunded Needs	Percent Unfunded
Private/Amtrak/Oregon/ BC/Others	1,644	577	1,067	65
WSDOT Action Strategies	1,263	0	1,263	100
Total	2,907	577	2,330	80

Of the \$2.9 billion need, 65 percent is unfunded. For the WSDOT Intercity Rail Passenger Program — 43 percent of the total needs for intercity passenger rail — the shortfall is 100 percent. Over half of the statewide 20-year program relies on new revenue sources.

Intercity Passenger Rail 20-Year Costs



Funding for the Plan is Based on Partnerships

The plan represents a good investment for the state because funding for the statewide public transportation needs will be shared between the state and its partners, federal and local governments, and the private sector. The majority of 20-year needs for public transportation, including HCT, will be met by revenues generated at the local level. Over half of the needs for passenger rail will be met by private, federal, and other revenue sources.

Even WSDOT’s own internal programs — led by the Public Transportation, High Capacity Transportation, and Rail Offices — are supported by a mix of state, federal, and private revenues. Federal funds provide 75 percent of the Public Transportation Office’s current law budget; the majority of this funding is passed through as grants primarily to social service providers and a few small transit agencies. The remaining 25 percent, funded from WSDOT’s transportation fund, provides technical assistance, planning, rural mobility grants, interagency coordination, plan and report review/evaluation, and public education.

Plan Implementation Depends on Increasing Revenue

For the 1995-97 biennium, WSDOT’s public transportation, high capacity transportation, and intercity rail passenger programs comprise 1.3 percent of WSDOT’s total budget. If these programs were funded at the level targeted by the Transportation Commission in the WTP constrained plan, they would comprise 5.6 percent of the WSDOT total budget. The majority of this funding (3.2 percent) would support the intercity rail passenger program. The balance would be split between the Public Transportation Office (1 percent) and the High Capacity Office (1.4 percent). The majority of the HCT Office budget would be used to assist construction of any future HCT projects.

The Transportation Commission has set a 20-year funding target to support these upcoming transportation services and modes, shifting emphasis toward a more multimodal, intermodal transportation system. To succeed, the plan needs increased revenue from a variety of revenue sources. The plan's success also depends on the continuation of Commission support for the WSDOT Action Strategies throughout the upcoming budget processes and into implementation.

In Conclusion — Working Toward a Balanced Transportation System

The plan will preserve existing services and facilities, improve connectivity (travel between systems and modes), rural mobility, geographical accessibility, and efficiency. By increasing transit, high capacity transit, high occupancy vehicle lanes, and transportation demand management strategies, public transportation will fulfill its key role in reducing congestion and improving air quality.

Investing in statewide intercity rail passenger system as proposed in this plan will improve capacity and reliability in the Pacific Northwest Rail Corridor and provide minor improvements to both east/west corridors. Investment will occur in stages or phases rather than all at once, and significant investment will be directed at improving existing facilities rather than constructing brand new or replacement facilities.

Higher passenger rail frequencies and shorter travel time will improve customer convenience, as will greater reliability produced by scheduling and infrastructure improvements. Improvements will provide increased comfort, convenience, and safety for intercity passengers as well.

The Commission's funding targets for this plan (and for the *Washington's Transportation Plan*) represent a realistic and achievable package of transportation services for the next 20 years. Investing in the 20-year vision for public transportation and intercity passenger rail will contribute to producing a balanced transportation system for the people of Washington State.

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How and Why Was This Plan Developed?

This plan, the *Public Transportation and Intercity Rail Passenger Plan for Washington State*, describes the services, facilities, and programs for the future, what to preserve, and what to improve.

Legislative Background to the Plan

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) directed all states to develop multimodal transportation plans. Following the federal legislation, the Legislative Transportation Committee (LTC) completed the *State of Washington LTC Public Transportation Study* in 1992; the study recommended development of a plan identifying state goals and state interest for public transportation. The legislature included this recommendation in a larger bill (RCW 47.06.040) to develop a statewide multimodal plan, known as *Washington's Transportation Plan (WTP)*. The legislature directed that the WTP contain a state-owned and a state-interest component.

How WTP Separates State-Owned From State-Interest Components of the Transportation System

WTP is divided into two parts. The first part addresses the state-owned components of the transportation system — those elements for which the Washington State Department of Transportation (WSDOT) is directly responsible. These are the state-owned airports, Washington State Ferries, and the state highway system.

The second part of the WTP is the state-interest component — elements of the transportation system in which the state has an interest but has no direct operational or maintenance responsibility. These include aviation, marine ports, bicycle and pedestrian programs, freight rail, passenger rail, and public transportation.

What the State-Interest Component of the Plan Must Include

The legislative mandate directs the statewide multimodal transportation plan to include a state public transportation plan that:

1. Articulates the state vision of an interest in public transportation and provides quantifiable objectives, including benefits indicators;
2. Identifies the goals for public transit and the roles of federal, state, regional, and local entities in achieving those goals;
3. Recommends mechanisms for coordinating state, regional, and local planning for public transportation;
4. Recommends mechanisms for coordinating public transportation with other transportation services and modes;

5. Recommends criteria, consistent with the goals identified in subsection (2) of this section and with RCW 82.44.180 (2) and (3), for existing federal authorizations administered by the department to transit agencies; and
6. Recommends a statewide public transportation facilities and equipment management system as required by federal law.

How This Plan Fits Into the Larger Planning Process

The *Public Transportation and Intercity Rail Passenger Plan for Washington State* meets the original recommendation of the LTC Public Transportation Study. A summary of the plan was first published as a chapter of the WTP; the complete plan is an appendix to the WTP.

The WTP is the planning instrument that guides investment in the multimodal transportation system. The broad state vision and policy direction for all modes of transportation comes from the Washington State transportation policy planning process. Exhibit 1 shows the components of the planning process used to develop the *Public Transportation and Intercity Rail Passenger Plan for Washington State*.

This plan integrates the intercity passenger rail and public transportation elements of WTP into a single document.

Defining Public Transportation

Public transportation services have been available in Washington State since the 1860s. Historically, private companies provided public transportation. However, as the automobile increasingly dominated the transportation marketplace, privately-owned transit systems were abandoned or assumed by local government while the federal government has managed passenger rail.

In the ensuing years, transit has traditionally been considered largely a local responsibility while passenger rail has been more a national issue. In reality, however, over the last 30 years, a complex partnership has evolved between federal, state, local governments, and the private sector.

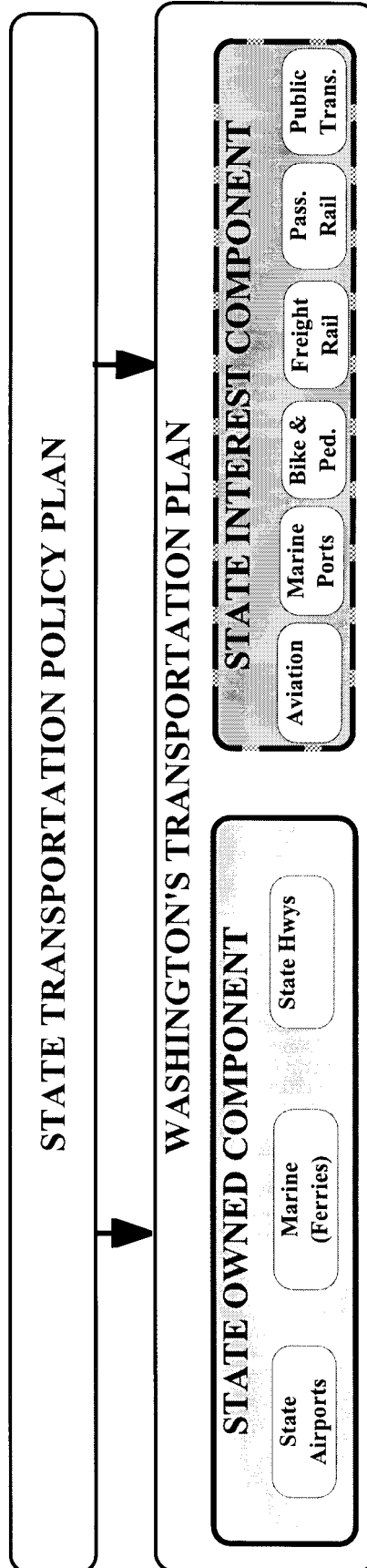
Recognizing the Importance of Public Transportation, 1965

The Washington State legislature recognized the importance of public transportation in 1965 when it declared:

“All persons in a community benefit from a solvent and adequate public transportation system, either directly or indirectly, and the responsibility of financing ... such systems is a community obligation and responsibility which should be shared by all.

We further find and declare that the maintenance and operation of an adequate public transportation system is an absolute necessity and is essential to the economic, industrial and cultural growth, development and prosperity of a municipality and the state and nation, and to protect the health and welfare of the residents of such municipalities and the public in general.”

Exhibit 1



WSDOT Defined Public Transportation in 1992

In 1992, at the direction of the Washington State Transportation Commission, WSDOT defined public transportation as:

“ . . . a publicly supported system of services and facilities that provides an alternative to the single-occupant automobile and enhances mobility, environmental quality and appropriate land use patterns. Such systems may include any combination of services, facilities, and the necessary infrastructure related to transit, paratransit, ridesharing, intercity bus, airport shuttles, passenger rail, ferries, pupil transportation, high capacity transit, transportation demand management, people movers, bicycle and pedestrian programs.”

WSDOT’s inclusive definition of public transportation — impacting a wide variety of modes and stakeholder groups — adds to the challenge of planning.

The Challenge of Defining State Responsibility

The state is interested in increasing public transportation choices, in developing efficient and easy to use connections between modes, and in coordinating state, local, private, and federal public transportation.

The challenge lies in identifying the mix of services, facilities, and programs needed to develop choices, connections, and coordination — and in determining the costs, future financial resources, and in defining the state, regional, and local responsibilities.

The State is Already a Partner

One reason for articulating the state’s interest and responsibilities in public transportation is that a partnership already exists: the state now leases (and will eventually own) and operates rail passenger trains under contract with Amtrak. The state also provides grant programs, training, technical assistance, planning, and demonstration projects for public transportation.

Public Investment in Transit

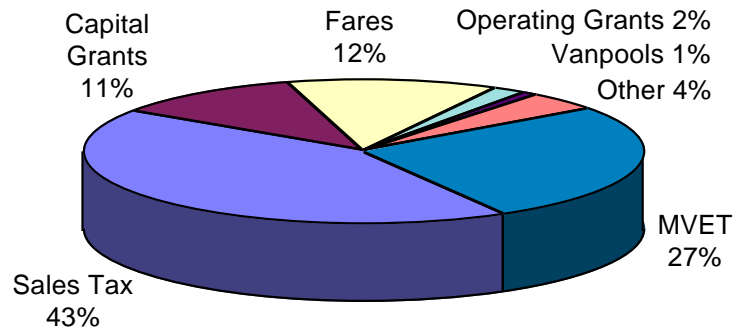
The level of public investment in transit is another reason for articulating state interest and responsibility in public transportation. The state has an interest in ensuring that local improvements are responding effectively to growth pressures and legislative mandates and to the need for better intermodal connections.

In 1995, the 24 active public transit authorities had revenues of \$630 million. Over \$167 million — or 27 percent of the total transit revenues for 1995 — came from the share of the Motor Vehicle Excise Tax (MVET) that goes to the Public Transportation Benefit Areas (PTBAs).

The following chart presents the various revenue sources, including sales tax, MVET, fares, capital grants, and operating grants.

1995 Transit Revenues

Total: \$630 million



Policy Statements and Objectives — The Basis for Action Strategies

The first formal attempt to define the state interest in public transportation produced 22 policy statements. Based on recommendations from the public and the State Transportation Policy Plan Steering Committee, the Transportation Commission approved them in December 1992. The WSDOT Public Transportation and Intercity Rail Passenger objectives were derived from these policy statements. (Chapter 4 details the objectives, in addition to the 22 policy statements.)

The Public Transportation Advisory Committee (PTAC) guided the development of the service objectives.

In developing action strategies, PTAC again helped WSDOT to define what it can do to meet its objectives. The action strategies include new grant programs, state oversight, training, demonstration projects, planning, and rail and HCT construction projects. Chapter 5 lists the action strategies.

What's the Technical Foundation for This Plan?

The *Public Transportation and Intercity Rail Passenger Plan for Washington State* was developed with the aid of a survey, a needs assessment, and a new database. The trade-off process the WTP used to financially constrain the plan is discussed in Chapter 7. The plan also presents two new tools for planning and evaluating future public transportation efforts.

Public Transportation Survey 1993

In late 1993, WSDOT completed a comprehensive survey of public transportation services, facilities, and programs in operation across the state. This survey covered more than 220 agencies including transit and paratransit operators, transportation brokers, private and public ferry operators, social service agencies, private intercity bus carriers, state transportation providers, WSDOT Rail Office, WSDOT regional planners, and metropolitan and regional planning agencies.

New Database

The responses to the 1993 summary were analyzed using the recently developed Statewide Public Transportation Inventory Computer Database. This information provides the baseline data for the Public Transportation County Profiles. (See Appendix B under separate cover.)

Using the Needs Assessment in the Trade-off Process

In 1994, WSDOT conducted a needs assessment for the period 1994-2013. Needs were developed for five public transportation categories: transit, paratransit, high capacity transportation, park and ride lots, and WSDOT action strategies. These projections were then updated for the period 1997-2016. Chapter 6 describes the needs that were identified.

The updated needs assessment provided the costs that were used in the WTP's trade-off process. WTP used a process of tradeoffs to balance the distribution of possible future revenues among transportation modes. Tradeoffs are necessary because there will be insufficient revenues to fund all needs for all modes.

Options Report

WSDOT led the development of the 1995 *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report*. Also referred to as the Options Report, the report focused on the future needs of the south/north rail corridor extending 466 miles from Eugene, Oregon, to Vancouver, BC. Sponsorship for this report was shared with the British Columbia Ministry of Employment and Investment and the Oregon Department of Transportation.

The Options Report looked at 20-year needs for increased service, reliability, safety, and capital improvements, and also at costs.

New Planning Tools

Finally, the plan presents two new tools for planning and evaluating future public transportation efforts. The first new tool is the Public Transportation Facilities and Equipment Management System (PTMS), now an option under ISTEA. Considered useful at the state level, the PTMS provides a means for inventorying and monitoring the condition and availability of vehicles, equipment, and facilities used by public transportation providers in Washington.

The second new tool is an Access Index, the product of research asking whether it is feasible to measure the availability of public transportation services in our communities. The Index is experimental and must be tested. It attempts to measure access to public transportation services from a state interest perspective. A description of the research and the model is provided in the plan.

In Chapter 5, the Action Plan, other new tools are described in the action strategies.

What Was the Public Involvement?

As the plan was developed, WSDOT described its progress in several publications, including WSDOT's *Grass Routes* and the Washington State Transit Association (WSTA) newsletter. In December 1993, the *State Public Transportation Plan: Interim Report* was published and distributed to a wide audience. A summary of the plan (including the list of objectives and action strategies) was published as an element of *Washington's Transportation Plan* and distributed throughout the state via a direct mailing list and by distribution at regional forums, fairs, and various meetings.

The Public Transportation Advisory Committee has played a vital role in public involvement. Representing over 30 different agencies, members have relayed important information to their agencies and their respective interested parties and have provided WSDOT with valuable input to the planning process.

In addition, the Technical Oversight Committee (TOC) guided the development of the *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report*. Currently, the environmental impact analysis associated with rail corridor improvements has generated a major public involvement effort.

What Does This Plan Accomplish?

The Public Transportation and Intercity Rail Passenger Plan for Washington State meets legislative mandates by:

- establishing a current baseline of information and data for public transportation and intercity rail passenger service;
- defining state interest and state roles;
- identifying issues, needs, resources, and deficiencies; and
- proposing action strategies to address state responsibility.

The plan provides decision makers with a 20-year view of the future. Policies, needs assessments, and data will be continuously revised and the plan updated biennially. This framework will assist Washington State in building a public transportation system that meets the needs of its people to the year 2016.

Before Talking About the Future . . .

In planning for the future of public transportation, it is first necessary to assess the current condition of public transportation in Washington State.

The first section of this chapter describes the services, facilities, and programs provided by public transit, high capacity transportation, passenger rail, intercity bus, paratransit, vanpools/ridesharing, and park and ride lots. These modes are the focus of state interest in public transportation.

However, state interest extends to how these modes connect to ferries, airports, and nonmotorized transportation. The chapter's second section briefly describes the services, facilities, and programs of ferries, airports, and nonmotorized transportation in preparation for a discussion of intermodalism.

The last section of the chapter defines the concepts of multimodalism and intermodalism and discusses the current availability of intermodal connections in Washington State.

Washington State Blends Tradition and Innovation in Public Transportation

Washington State offers a unique blend of historic, traditional, and innovative public transportation modes. Monorail service has operated in Seattle since the 1962 World's Fair. Still popular with tourists and locals, the monorail, operating over a 0.9-mile track, provides 43,200 annual trips a year. The Satellite Transit System (STS) at the Seattle-Tacoma International Airport operates an underground people mover that connects the main passenger terminal with the remote satellite terminals.

Seattle is also home to the Waterfront Streetcar System which runs on a 2.1-mile track linking the International District, Pioneer Square, downtown, and the waterfront. These vintage, circa 1928, electric-motored trams were imported from Australia. On a seasonal basis, the Yakima Electric Railway Museum operates a vintage electric trolley between Yakima and Selah. Within the Spokane urban core, the Spokane Falls Streetcar makes a 2-mile loop. It uses modern rubber tire technology and was placed into service in early 1995. Metro operates modern dual power articulated buses in the Puget Sound region. New to the scene are the *Mount Baker International* and *Mount Adams* trains. Utilizing higher speed, tilt train technology, the Spanish engineered Talgo train provides service in the Pacific Northwest Rail Corridor on two routes, Portland, Oregon/Seattle and Seattle/Vancouver, B.C.

Current Public Transportation and Intercity Rail Passenger System

Public Transit

There are 24 public transit authorities currently operating in Washington State. In 1995, approximately 85 percent of the state's population resided within the boundaries of a transit provider. A map showing the locations of the transit authorities is provided on page 2-3.

Governance for Public Transit

There are a number of legislative options for the administrative and financial organization of public transit agencies. The options for governance include: Metropolitan Municipal Corporations, County Transportation Authorities, Public Transportation Benefit Areas (PTBAs), cities and towns, and counties (unincorporated areas only). Most of the local transit agencies are organized under the authority of a PTBA. PTBAs are separate legal entities which may range in service area size from less than county-wide to multiple counties. A majority of voters must pass the PTBA measure to establish a taxing authority. The local sales tax generated, up to six tenths of a percent, is matched by motor vehicle excise tax. (Refer to the Glossary for more information on each of the governance options for public transit agencies.)

To date, PTBAs have been formed in Clallam, Clark, Cowlitz, Island, Jefferson, Kitsap, Lewis, Mason, Pacific, Pierce, Skagit, Snohomish, Spokane, Thurston, Walla Walla, and Whatcom Counties. Bi-county PTBAs operate in Benton and Franklin Counties and in Chelan and Douglas Counties. Four of the state's transit operators are organized under the authority of cities and towns: Everett, Prosser, Pullman, and Yakima. The Grays Harbor Transportation Authority is the only County Transportation Authority (CTA) in the state, while King County Metro is the only Metropolitan Municipal Corporation.



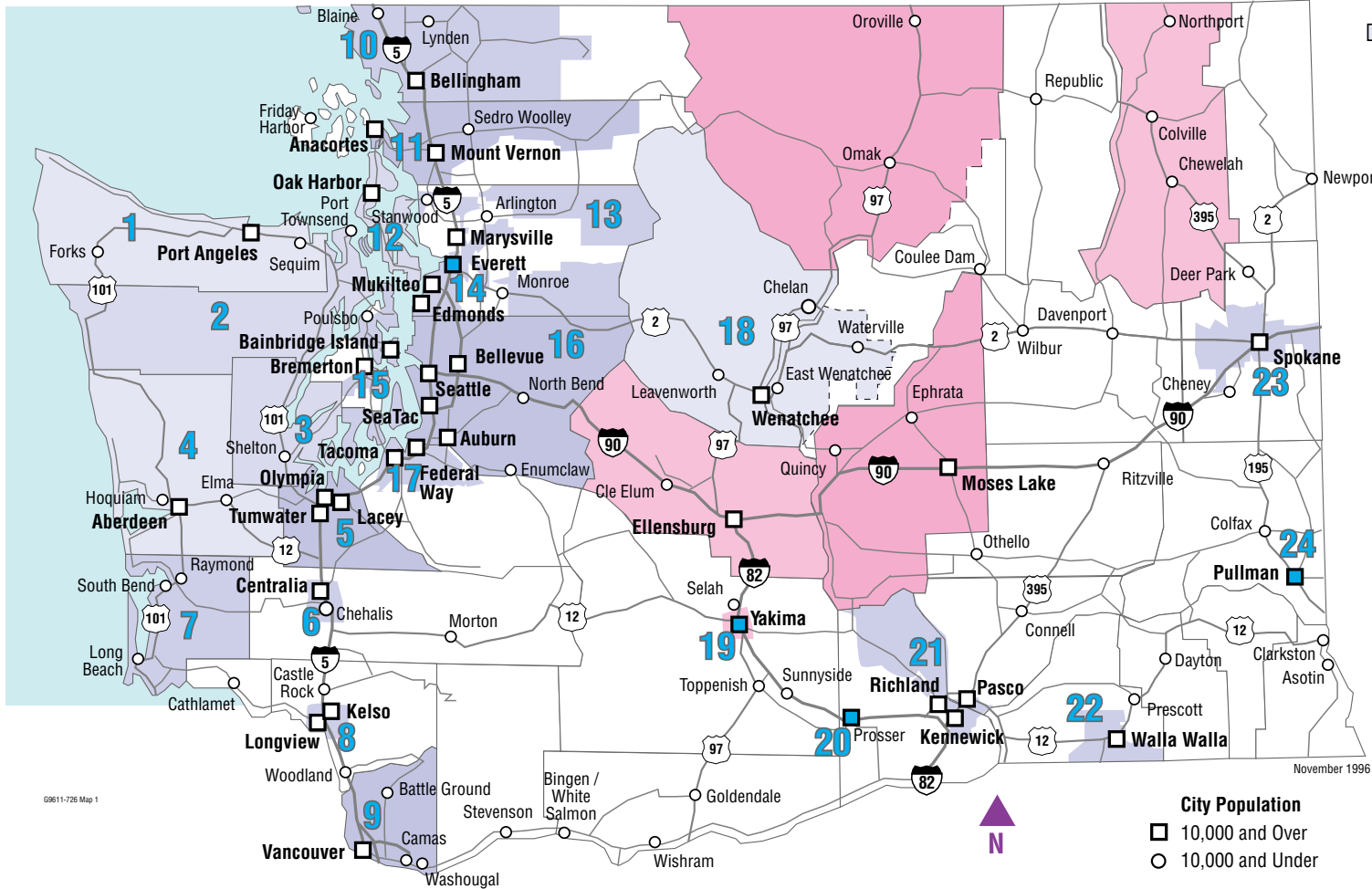
Services Provided in 1995

The majority of transit agencies provide fixed route and demand response service (including *complementary paratransit*, Americans with Disabilities Act (ADA) service), vanpool and rideshare services and programs, and park and ride facilities. Nearly 137 million passenger trips and over 89 million passenger vehicle service miles were provided in 1995, as part of fixed-route and demand-response services in urban and rural areas. Vanpool services and ridesharing programs are offered by 13 public transit

agencies. Ridership for this mode of travel totaled 3.3 million in 1995, with 994 vehicles operated over 13 million miles.

Washington State Public Transportation

Transit Authorities



Legend

Transit Systems

- Regional Systems
- City Systems
- PTBAs that have been formed and are pending local voter approval for funding.

- 1 Clallam Transit
- 2 Jefferson Transit Authority
- 3 Mason County Transportation Authority
- 4 Grays Harbor Transportation Authority
- 5 Intercity Transit (Thurston County)
- 6 Twin Transit (Lewis County)
- 7 Pacific Transit System
- 8 Cowlitz Transit Authority (Longview/Kelso)
- 9 C-TRAN (Clark County)
- 10 Whatcom Transportation Authority
- 11 Skagit Transit Authority
- 12 Island Transit
- 13 Community Transit (Snohomish County)
- 14 Everett Transit
- 15 Kitsap Transit
- 16 King County Department of Metropolitan Services (Metro Transit)
- 17 Pierce Transit
- 18 Link (Chelan-Douglas Counties)
- 19 Yakima Transit
- 20 Prosser Rural Transit (Benton County)
- 21 Ben Franklin Transit (Benton-Franklin Counties)
- 22 Valley Transit (Walla Walla County)
- 23 Spokane Transit Authority
- 24 Pullman Transit

City Population

- 10,000 and Over
- 10,000 and Under

Annually, the Washington State Department of Transportation (WSDOT) publishes the *Summary of Public Transportation Systems in Washington State*. This report provides details on existing services, objectives, service standards, achievements, facilities, operating statistics, performance indicators, and revenues and expenses for each transit agency. For additional information on the 24 transit agencies, the reader is referred to the *1995 Summary Report* and the 39 Public Transportation County Profiles and Regional Maps in Appendix B.

Paratransit

Paratransit service is aimed at special needs populations — seniors, persons with disabilities, and others who may have difficulty using regular fixed-route transit services, or who do not have access to a public transit system in their area. One way to deliver this specialized transportation is through *dial-a-ride* or *demand-response* service. This is a flexible public transportation service that requires a reservation prior to the trip and offers door-to-door or curb-to-curb service.

Paratransit service is offered by several kinds of providers. ADA requires public transit agencies to provide *complementary paratransit* service to customers residing less than three-fourths of a mile from a fixed-route bus corridor in urban areas, up to 1.5 miles in rural areas. Some transit agencies provide broader coverage within their service area and some provide only the minimum ADA requirements. Patrons must be ADA eligible to use this service; they must have a transportation limitation which prevents them from using regular fixed-route service.



Public transit agencies may provide complementary paratransit service themselves or contract with another provider. Nonprofit organizations also provide service using federal and state funds designated for persons over 60, persons with disabilities, and Medicaid clients. For-profit agencies (i.e., taxi companies) also provide trips for persons with special needs. Paratransit service to Medicaid clients is generally arranged by brokers of transportation under contract with the Department of Social and Health Services (DSHS). DSHS has contracted with 13 agencies who are responsible for contracting with various

providers of transportation, generally over a multi-county area to serve all eligible Medicaid clients. Refer to map on page 2-7.

High Capacity Transportation (HCT)

Additional transportation capacity in the state's major urban areas is vital to meet the demands of projected growth, address the future need for movement of people and goods, and support adopted growth management policies. HCT systems, including expanded trunk bus, feeder bus, commuter rail, and light rail transit are economically viable alternatives to highway construction.

The Washington State Ferries is a good example of a high capacity transportation system. (A thorough discussion of the Washington State ferry system can be found on page 2-15.) High capacity transportation also includes express bus services. Some local transit systems operate express bus services in the Puget Sound area: Community Transit, Metro Transit, Pierce Transit, and Intercity Transit. In addition, C-TRAN operates express bus services into Portland on the I-5 and I-205 corridors. Express bus services are primarily available during peak hours.

Planning for HCT

Grants from the High Capacity Transportation Account support planning activities in four areas of Washington State: Central Puget Sound, Vancouver/Clark County, Spokane, and Thurston County. The High Capacity Transportation Account may also fund Expert Review Panels for HCT projects, where required.

High Occupancy Vehicle (HOV) Lanes

HOV lanes are an important element of a HCT system in that they provide for more efficient movement of express buses, carpools, and vanpools.

There are 131 HOV lane-miles opened to traffic in the Puget Sound region on segments of I-5, I-90, and I-405, and on SR 167 and SR 520. Another 21 lane-miles are currently under construction, with 23 more lane-miles scheduled to begin construction soon.

In 1995, HOV lanes were completed on I-405 through the Renton S-curves, and north to Kingsgate. Work is ongoing to complete HOV lanes on I-5 between Tukwila and Boeing Field, and from the Snohomish/King county line to 164th Southwest in Snohomish County.

HOV lanes are currently being considered for other regions of the state, as part of the planning efforts in Clark, Spokane, and Thurston Counties.

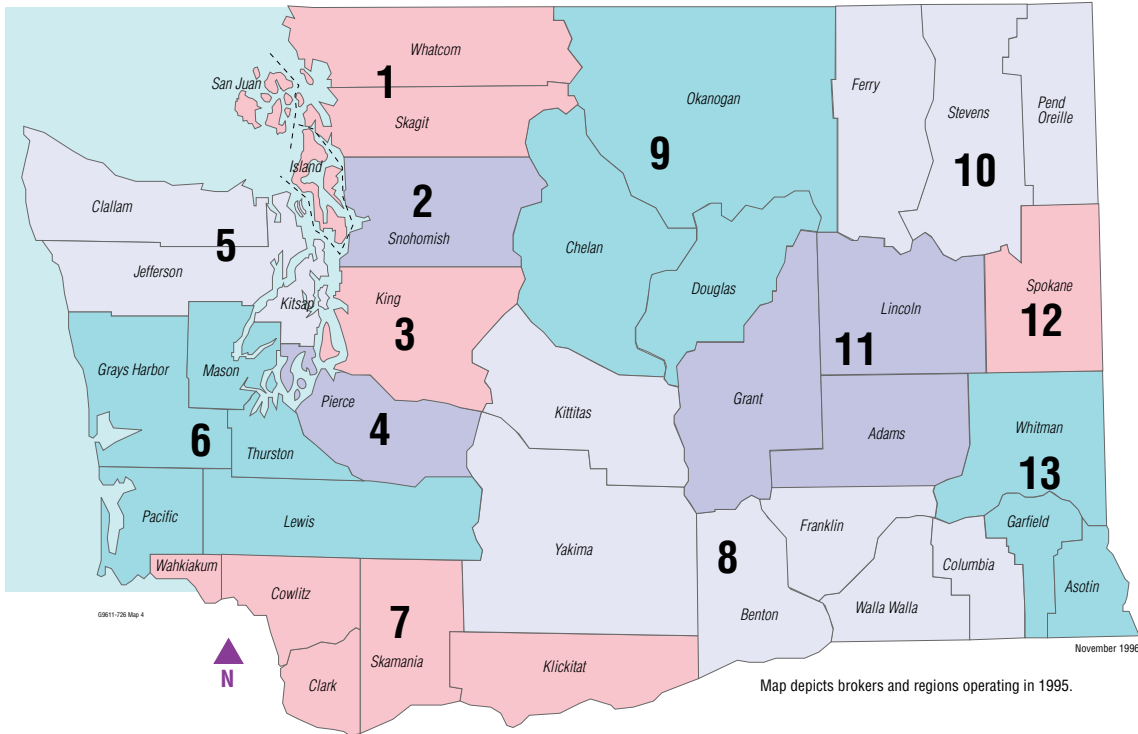
Regional Transit Authority

The Regional Transit Authority (RTA) is now planning a seamless system of mass transit services and an integrated fare policy for Snohomish, King, and Pierce Counties. The planning activities attempt to preserve communities and open space, conserve energy and enhance the economic vitality of the region.

The RTA's *Ten-Year Regional Transit System Plan* proposes starting a commuter rail system, beginning work on a new regional light rail system, and providing more frequent and improved bus services and facilities throughout the region. The RTA won voter approval on implementation of the plan in November 1996.

Washington State Department of Health and Social Services

Medical Assistance Administration (MAA) Regional Brokers



Legend

- 1 NW Planning Council
- 2 Snohomish County AAA
- 3 Multi-Service Center of North and East King County
- 4 Paratransit Services
- 5 Paratransit Services
- 6 Paratransit Services
- 7 Human Services Council
- 8 People for People
- 9 Trancare
- 10 NE Rural Resources
- 11 People for People
- 12 Special Mobility Services
- 13 Council on Aging

Map depicts brokers and regions operating in 1995.

South/North (Clark County)

Two states and 14 jurisdictions have been participating in the *South/North Transit Corridor Study*. This group has been analyzing possible high capacity transportation solutions to respond to the population growth and traffic congestion in the Vancouver-Portland metropolitan area. Increasingly serious traffic delays on the I-5 bridge crossing the Columbia River have caused concern in both Washington and Oregon. In the early 1980s, the I-5 bridge was at capacity during the evening rush hour. By 1988, traffic on the newly completed I-205 bridge had exceeded forecasts for the year 2000. Traffic in the I-5 corridor is more congested today than it was before the I-205 corridor was completed. The Regional Transportation Plans for both the Portland and Vancouver portions of the metropolitan region recommend pursuing a transit solution to the bi-state accessibility problem rather than developing an additional highway bypass alternative.

A locally preferred alternative was selected in 1994, and the *South/North Transit Corridor Study* recommended an enhanced transit and light rail transit solution from the areas of Oregon City, Oregon, and to 5 miles north of Vancouver, Washington. The proposition was presented to the voters of Clark County in February 1995 and was defeated. Local and regional transportation planners and elected officials are currently reassessing the future of high capacity transportation planning in Clark County. The *Draft Environment Study for the South/North Transit Corridor System Plan* still includes the Clark County portion.

Transportation Demand Management (TDM)

TDM is a strategy for urbanized areas to deal with the problems of diminishing air quality and increasing traffic congestion. In 1991, the Washington State legislature passed its own TDM law which affects the eight most populous counties of the state. This Commute Trip Reduction (CTR) law is modeled after the federal Clean Air Act's more restrictive law that affects states with serious air quality problems. The CTR law is an employer-based law targeted at shaping transportation choices.

TDM programs promote the use of transit as well as the development of other alternatives such as ridesharing, telecommuting, teleconferencing, employee based incentives, and nonmotorized transportation. The purpose is to effect a change in behavior by educating and informing people that their choice of modes can minimize congestion, use the existing transportation system more efficiently, and save energy.

WSDOT has played a major role in the implementation of the CTR law and has a trip reduction program for its own employees. WSDOT TDM programs include: the Office of Urban Mobility's TDM Resource Center funded by ISTEAs money; support for the regional ridesharing coordinators; the internal TDM program for employees; and some technical support for CTR and TDM in general.

Park and Ride Lots

A recent state survey identified 262 park and ride lots offering 30,345 parking spaces to commuters and other travelers. The majority of these lots are located in or adjacent to urban areas. Park and ride lots serve as important intermodal facilities that link automobile and nonmotorized trips to public transportation, such as carpools, vanpools, and transit. Two-thirds of the state's park and ride lots are located in the Puget Sound region. In King County alone, there are 89 park and ride lots providing 16,191 parking spaces to commuters and other motorists. Several have bus shelters and a few have bicycle lockers.

Intercity Bus

Washington State is currently served by ten fixed-route (regularly scheduled service) intercity bus carriers (see maps on pages 2-11 and 2-13). The largest carrier, Greyhound Lines, operates a multitude of routes and schedules serving 15 terminals in the state.



These companies provide a critical link in Washington's public transportation network. They connect with many rail stations and transit providers and are important players in developing our state's intermodal facilities. Unfortunately, service has been suspended or eliminated in some rural areas of the state. There is a need to identify ways in which they can sustain their services, both in the short and long term, through improved coordination with local public transit

agencies, Amtrak, and local jurisdictions. As a result, the traveling public would realize a more efficient, customer-service oriented public transportation system.

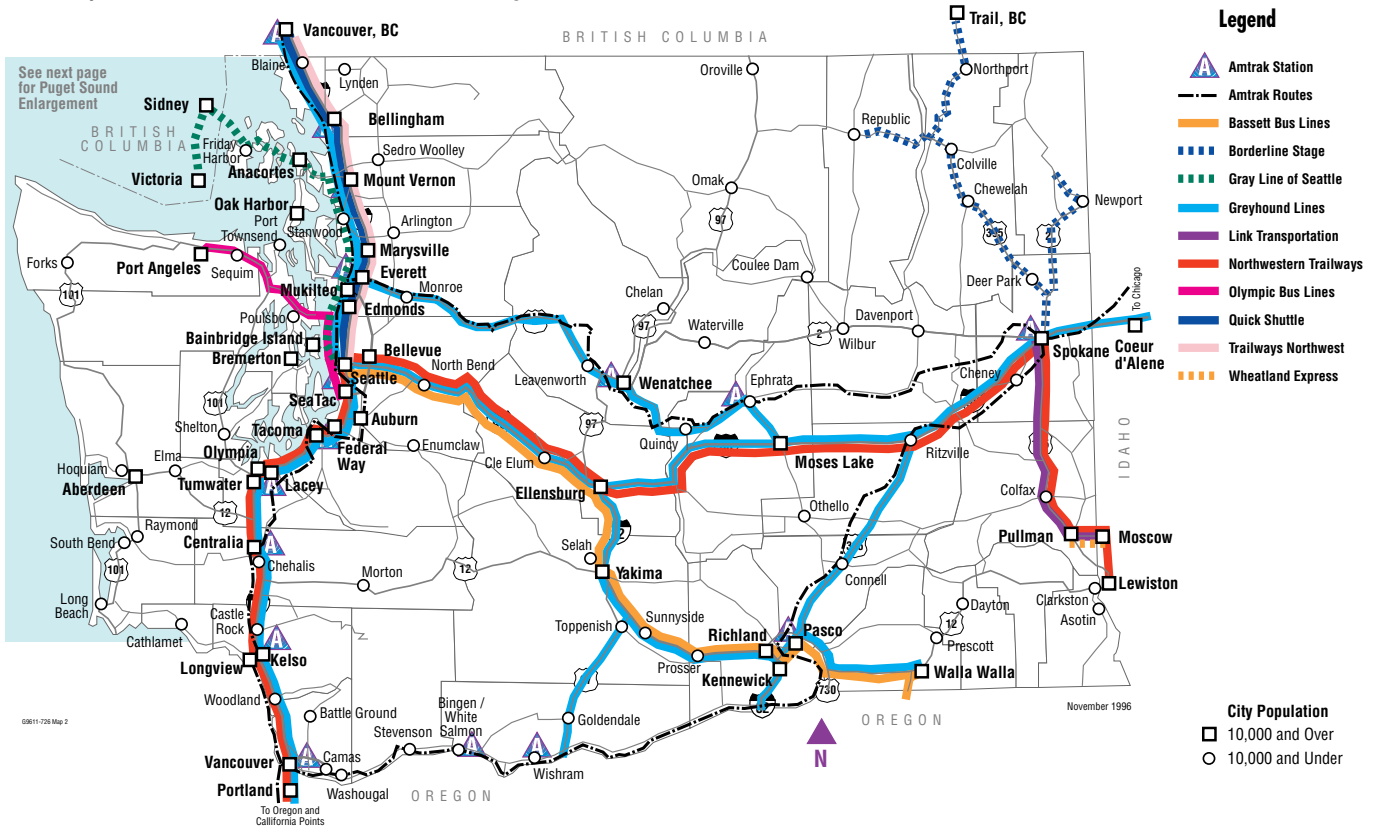
Intercity Rail Passenger System

The Intercity Passenger Rail System currently services the following routes: Seattle/Vancouver, B.C., Seattle/Portland, Seattle/Spokane, and Spokane/Portland. Amtrak services depots in 16 communities (refer to map on pages 2-11 and 2-13). The statewide ridership in 1995 for the five routes totaled 642,784.

The 186-mile-long Seattle to Portland route is an integral part of the Pacific Northwest Rail Corridor from Eugene, Oregon, to Vancouver, B.C. The route is served with daily round trips by three trains: the *Mount Rainier*, *Coast Starlight*, and *Mount Adams*. These trains serve stations at Vancouver (USA), Kelso/Longview, Centralia, Olympia/Lacey, Tacoma, and Seattle. Three days per week an additional train, the *Pioneer*, provides service. (However, there are plans to cut the *Pioneer* within six months.) Scheduled trip times range from 3 hours 50 minutes to 4 hours 10 minutes. Public transit service is available at all six stations. The Seattle to Vancouver, B.C., service was reinstated in May 1995. Known as the *Mount Baker International*, it serves Seattle, Everett, Edmonds, Mount Vernon/Burlington, Bellingham, and Vancouver, B.C. The average trip time is 3 hours 55 minutes with transit service available at all stations.

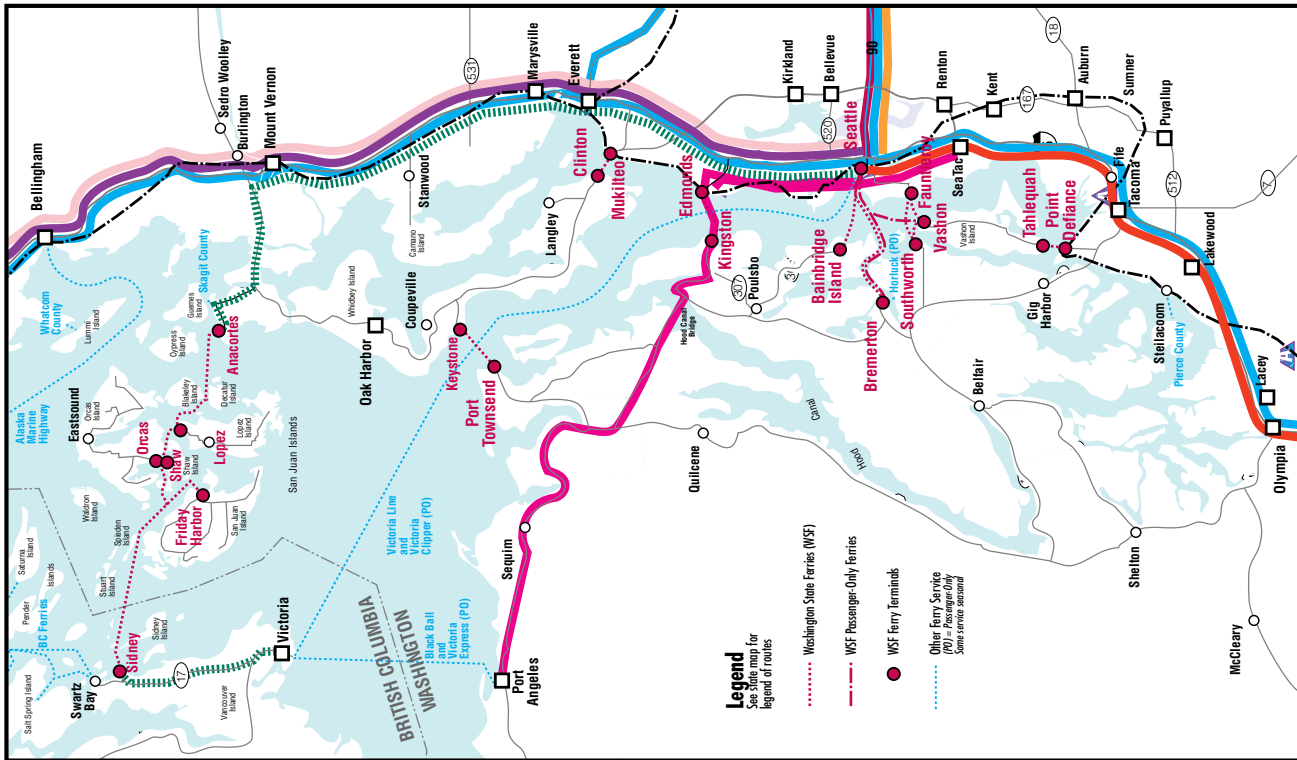
Washington State Public Transportation

Intercity Bus Carrier Routes and Amtrak Rail Passenger Service



Washington State Public Transportation – Puget Sound Enlargement

Intercity Bus Carrier Routes, Amtrak Rail Passenger Service, and Ferry Service



Legend
See site map for legend of routes

- Washington State Ferries (WSF)
- - - - - WSF Passenger-Only Ferries
- WSF Ferry Terminals
- Other Ferry Service (PO) = Ferry and Other
Some services seasonal

The *Mount Adams* and *Mount Baker International* trains, serving the Pacific Northwest Rail Corridor, are state sponsored. Currently, WSDOT is leasing train sets, funding operations, and contracting with Amtrak for service.



The *Empire Builder* serves the corridor between Seattle and Spokane, a length of 326 miles, four days per week. Stations include Spokane, Ephrata, Wenatchee, Everett, Edmonds, and Seattle. Scheduled trip time between Seattle and Spokane is 8 hours. Transit connections are made at five of the six terminals, all except for Ephrata. The Spokane to Portland route is also served by the *Empire Builder* with stops at six stations (Spokane, Pasco, Wishram, Bingen/White Salmon, Vancouver, and Portland) along the length of 378 miles. Scheduled trip time is 7 hours and 25 minutes. Transit serves four stations, Spokane, Pasco, Vancouver, and Portland.

The Rail Office, WSDOT, plans to improve rail services and further develop multimodal stations during the next 20 years. WSDOT, Oregon State Department of Transportation, and the British Columbia Ministry of Employment and Investment contracted in 1995 with Morrison Knudsen Corporation to prepare the *Options For Passenger Rail In The Pacific Northwest Rail Corridor: A Planning Report* (included under a separate cover as Appendix C) which outlines preliminary needs and costs for developing the rail corridor from Eugene, Oregon, to Vancouver, B.C., for the 1996-2015 time frame. Currently, a major public involvement effort and the environmental impact analysis is underway. When completed, this new information will be integrated into a final *Pacific Northwest Rail Corridor Passenger Plan*.

Other Public Transportation Providers

Three other modes are traditionally considered to be public transportation: passenger-only and passenger-vehicle ferries, air travel, and nonmotorized transportation. Separate system plans are being prepared for the state-owned Washington State Ferries (WSF) and for the state-interest nonmotorized transportation. Air travel planning in the state is described in the *1993 Washington State Continuous Airport System Plan*.

These three modes are briefly described in order to provide context for a discussion of intermodal connections in the next section of this chapter.

Ferry System

In 1951, the Washington Toll Bridge Authority took over the operation of the privately-run Puget Sound Navigation Company and began operating the largest fleet of passenger and vehicle ferryboats in the United States. In 1977, the ferry system was incorporated into the Washington State Department of Transportation.

Current Public Transportation

WSF currently operates 24 vessels on Puget Sound. In 1995, state ferries provided 24,214,340 passenger trips and more than 10 million vehicle trips. System operations totaled 1,073,012 vessel miles. The system includes 20 terminals on 10 routes and a maintenance facility at Eagle Harbor. Presently, transit connections are made at nearly all ferry terminals except for Lopez and Shaw Islands, where there is no public transit service. Ferry ridership has grown steadily at about 5 percent a year, and the demand for transit connections is increasing.



Independent of WSF, the WSDOT Eastern Region operates the one-boat, Keller Ferry, across Lake Roosevelt on the Columbia River.

Several private ferries operate statewide. The Alaskan Ferries provide service from a terminal in Bellingham. Black Ball Transport offers service to Vancouver Island, B.C., from Port Angeles. Service from Seattle to Vancouver Island is operated by the Victoria Clipper, a passenger-only private ferry. A few small private ferry companies operate in Puget Sound and on the Columbia River. Furthermore, the Lake

Chelan Boat Company operates a private ferry from its dock at Chelan with stops at Fields Point, Lucerne, and Stehekin.

Airports

There are 13 primary/commercial, 6 reliever, and 43 general aviation airports in Washington State listed as facilities under the National Plan of Integrated Airport Systems (NPIAS). Primary/commercial airports are located in all major cities with Sea-Tac International (serving the greater Puget Sound Region) being the largest. Other NPIAS primary/commercial airports include: Anacortes, Bellingham, Friday Harbor, East Wenatchee, Pullman/Moscow Regional, Spokane International, Tri-Cities, Walla Walla City-County, William R. Fairchild International (Port Angeles), and Yakima. In 1990, a total of 29 airlines (20 domestic and 9 foreign flag carriers) provided scheduled passenger service in the state including such major carriers as: Alaska, American, Delta, Trans World, United, Pan American, Continental, Northwest, and America West. Major commuter airlines also include Horizon, United Express, and Harbor Airlines. The number of enplaned passengers for major, national, and foreign flag carriers totaled over 8 million in 1990.

Although much smaller in size, the NPIAS general aviation and non-NPIAS municipal airports provide a vital function statewide in small urban and rural areas. Private charter companies provide important intercity trips for business, medical, shopping, social, and recreational purposes. Furthermore, emergency air ambulance is available for critical medical trips. Public transportation offers limited services to some general aviation airports.

Nonmotorized Transportation

The Highways and Local Roadways Division, WSDOT, manages the state Bicycle and Pedestrian Program. Walking and bicycling programs are considered part of the state transportation system. Nonmotorized trips are made to commute to work and school, shopping, and for other utilitarian and recreational purposes. Nonmotorized trips are also linked to other modes at modest intermodal connections (i.e., bus shelters) or at major terminals such as multimodal rail stations. In congested urban areas, bicycling and walking are increasing in popularity. Eleven percent of commute trips in Seattle use nonmotorized travel modes.

Intermodal Connections

What is *Intermodalism*?

The Washington State Transportation Commission established the policy planning process to help shape decisions about Washington's transportation future. In 1994, the State Policy Plan Steering Committee created a subcommittee on Intermodal Transportation to develop and propose policy recommendations on the subject. The first task of the subcommittee was to define the terms *multimodalism* and *intermodalism*.

Multimodalism refers to the availability of transportation mode choices for people and goods. The concept of multimodalism is system oriented and describes a total transportation network.

Intermodalism is an operationally based concept which means the ability to make convenient connections between transportation modes for people and goods.

An example from the Intermodal Transportation Policy draft illustrates these concepts.

Intermodalism is illustrated by a traveler making a trip through a multimodal system. One such intermodal trip might start in Vancouver, Washington with the traveler driving a car to the passenger rail station, walking to the terminal, traveling on Amtrak to Tacoma, proceeding off the train at the Tacoma station, and taking a taxi to a business destination. Later the traveler takes an intercity bus from Tacoma to Seattle and uses Metro's downtown free Magic Carpet transit service to reach a business lunch. Subsequently, the traveler returns to the Seattle King Street Station by local transit and returns to Vancouver by rail. This trip, like most, has several pedestrian connection components between modal connections.



Presently, Washington residents make modal choices and intermodal connections every day. Most trips are short and involve few modal transfers. When we park the car at a park and ride lot and walk over to a friend’s car for a trip on the freeway to our place of work, the intermodal connection is the park and ride lot and we have changed from a single occupancy vehicle (SOV) to a high occupancy vehicle (HOV) ridesharing mode, probably making use of the HOV lanes.

Summary of Intermodal Connections

Several public transit providers make transfers to other transit operators, private intercity carriers, private and public ferries, Amtrak passenger rail, commercial airlines, and the automobile at park and ride lots. Although several providers are making intermodal connections, not all passengers are being served. This is due to the level of frequency of service — some providers may only connect at a facility once a day.

The following chart summarizes intermodal connections being made in the state, though it does not provide information about frequency of service.

Intermodal Connections

Public Transit Agencies	Connecting Modes			
	Intercity Bus	Ferry	Air	Rail
Ben Franklin Transit	x		x	x
C-TRAN	x			x
Clallam Transit System	x	x	x	
Community Transit	x	x		x
Community Urban Bus Service	x			x
Everett Transit	x	x		x
Grays Harbor Transportation Authority	x	x	x	x
Intercity Transit	x		x	x
Island Transit		x	x	
Jefferson Transit Authority	x	x		
King County Metro	x	x	x	x
Kitsap Transit	x	x		
Link	x	x	x	x
Mason County Transportation Authority	x			
Pacific Transit System	x			
Pierce Transit	x	x		x
Prosser Rural Transit	x			
Pullman Transit	x			
Skagit Transit Authority		x	x	x
Spokane Transit Authority	x		x	x
Twin Transit	x			x
Valley Transit	x		x	
Whatcom Transportation Authority	x	x	x	x
Yakima Transit	x		x	



Pedestrian- and Bicycle-Friendly Facilities

All transit providers offer some form of nonmotorized (pedestrian and bicycle) friendly facilities. Transit centers, transfer facilities, and bus connections at park and ride lots have been designed with the pedestrian and bicyclist in mind. Most have covered seating and walkways. Several have bike racks and some park and ride lots and transit centers offer bike lockers. King County Metro and Jefferson Transit are 100 percent bike accessible and Pierce Transit with its “Bikes On Buses” Program is moving quickly towards full accessibility. Shelters are commonly provided, especially by the urban systems. LINK provides ski racks on some of its buses as part of its winter service to the Mission Ridge ski lodge and bicycle racks the rest of the year.

Identifying Issues of Significance to the State

This chapter focuses on the issues that have shaped policy objectives and action strategies for public transportation and intercity passenger rail. The Washington State Department of Transportation's (WSDOT) responses to policy and governance issues have been shaped by input from the Public Transportation Advisory Committee, state and local agencies, and the public. The policy objectives follow in Chapter 4, Policy Development.

Choice Becomes Increasingly Important

For many years, transportation planning and programming focused on accommodating the automobile. The measure of success in transportation was the ability to move more vehicles more quickly. But as the transportation system has become increasingly congested, the availability of transportation choices has emerged as an important concept.

An Expanding Mission for Public Transportation

The mission and expectation for public transportation and intercity rail passenger services have greatly expanded in the last 20 years. In addition to their traditional role of serving transportation disadvantaged populations (and discretionary travelers, for rail), public transportation and intercity passenger rail are now expected to stimulate the economy, ease congestion, reduce pollution, resolve social inequities, and contribute to quality of life.

Federal and state legislation have also increased the State's role in public transportation and intercity passenger rail.

Defining "State"

When examining the state-owned components of the Washington's Transportation Plan, the concept of "state" is understood to be WSDOT. State highways, bridges, and the ferry system are clearly the responsibility of WSDOT.

However, when determining state interest in public transportation, the meaning of "state" is no longer so simple. Other state agencies such as the Department of Social and Health Services (DSHS), the Department of Health, the Superintendent of Public Instruction, the Department of Community, Trade and Economic Development, the Utilities and Transportation Commission, and the Department of General Administration also have a direct interest. For most agencies, that interest lies in ensuring access to programs and services. Their interest manifests itself in the direct purchase or provision of public transportation services or in regulating such services.

For this chapter's discussion of issues, a broad definition of "State" is appropriate — including all state agencies that provide or fund, directly or indirectly, transportation services or programs.

What Are the Major Issues for Transportation?

Several issues and trends impact planning for public transportation and intercity rail passenger services.

- Growth
- Environment
- Legislative mandates
- Economy
- Personal mobility
- Coordination

A healthy transportation system for the state of Washington must address each of these issues.

How Do These Issues Impact Transportation Planning?

A brief discussion of each of the issues listed above will illustrate the complexity of their impacts on transportation planning.

Growth

The state expects an increase of almost 2 million people in the next 20 years. Much of the growth will occur in congested urban areas where transportation capacity is already strained. The Puget Sound region is currently rated as one of the nation's five most congested areas. Because financial resources are stretched thin just in maintaining the existing infrastructure, regional plans and priorities have ruled out constructing major new highway capacity.



The growth rate of rural populations is even higher in many areas of the state than the general population rate of growth. Areas now not served by public transportation must address that growth within the next 20 years.

The graying of the Baby Boom Generation will also impact the demand for access in the future. Growth in the senior population will increase the disabled population, resulting in a higher demand for dial-a-ride, demand-response services.

Growth Management and Land Use

Growth management requires directly linking transportation and land use planning. This major statewide initiative directs growth to where it can best be served by the transportation system. The goal is to manage growth without overly constraining it and to thereby reduce the mitigation cost of growth. Growth management also provides opportunities to create an environment more conducive to alternative transportation modes such as public transportation and passenger rail.

The relationship of land use to transportation is fundamental. Growth continues to increase the burden on existing state highways and our ability to construct new highways is severely constrained. Developing alternatives — including land use patterns to ensure the success of these alternatives — is essential.

Environment

Air quality is a major concern for certain urban areas. Several urban regions in Washington State are already out of compliance with clean air laws. The single greatest source of CO and ozone precursor air pollution is automotive traffic — every 25 miles driven adds one pound of pollution to the air. By contributing to lung and allergy-related illnesses, dirty fuels have significant health care costs. Yet the growth of automobile ownership and vehicle miles traveled in Washington State exceeds that of the total population. To reduce pollution, vehicle trips will have to be decreased by shifting travelers from automobiles to alternative modes such as transit and vanpools.

Another environmental and transportation issue is the continuing consumption of open land and consequent loss of sensitive and diverse habitats. The space consumed by transportation infrastructure, including streets, roads, highways, and parking facilities, already takes up more than 50 percent of urban land. Expanding urban boundaries continue to absorb valuable open spaces. In the wake of the Growth Management Act, views differ about the best way to manage and direct growth.

Legislative Mandates

In the past, legislative mandates have required costly actions by lower levels of government without providing resources to mitigate costs. Such mandates include the Americans with Disabilities Act (ADA), federal and state clean air legislation, and commute trip reduction requirements. Pressures to balance budgets are expected to continue pushing program responsibilities to lower governmental levels without adequate resources for support.

Economy

In urban areas, the health of the economy is tied to the ability to move people and freight. Congestion strangles not just the vehicles and workers caught in it but all businesses whose competitive edge depends on their ability to deliver goods and services efficiently.

Congestion lengthens employee trips during business hours, increasing vehicle operating costs and decreasing productivity due to additional labor costs. Delivery costs increase. For retail and professional services which need to connect with their customer base, congestion can diminish sales. In addition, the cost of building and maintaining parking lots continues to increase.

The economy is also impacted by workers' ability — or lack of it — to commute to jobs and training. Traffic conditions affect employee punctuality, productivity, and morale. Employers in congested areas can experience problems with recruitment and turnover.

For welfare reform to succeed, workers must be able to find and maintain employment, whether in the urban core or suburbia. Many jobs in service and manufacturing industries long ago moved to the suburbs and many low income, inner city residents do not own cars.

How Transportation Choices Impact Rural Economies

The economy in rural areas is also impacted by the availability of transportation choices. Isolation, amplified by limited mobility options, has caused a loss of services and jobs in rural areas. Maintaining older families in their traditional homes, providing access to health care services and shopping, and connecting youth and families with employment and education are all important factors in stimulating rural economies. Public transportation has a role in providing each type of access. Yet rural resource bases may not be sufficient to support all access issues and local communities may need assistance in supporting their residents.

Personal Mobility

Most major life activities depend on having personal mobility. People must have access to transportation choices in order to obtain work and education or training, social and health services, and a range of household and recreational needs.

The need for mobility choices and for connections between modes of travel cuts across all activities and institutional structures. For this reason, ensuring continued mobility is a major state government priority.

Service Access

For health and social service programs, the question of spending limited funds on access or on program delivery becomes more crucial as budgets tighten. Should the social service dollar be spent on meals or miles? The responsibility for access may be passed on to local governments. Those local governments without transportation services in place may find their own general fund budgets at risk.

The U.S. Department of Health and Human Services has estimated it spends more than a billion dollars a year for access to Medicaid, Aging, and Head Start programs alone. This has significant implications on other programs when resources become more constrained. Local social service managers are already encouraged to utilize other existing services in their communities to defray costs to their own budgets. This permits the cost of access to be passed to the budgets of other programs such as local public transit authorities.

Coordination

Two coordination issues merit state interest: one is jurisdictional and the other is intermodal.

Jurisdictional Issues

Clearly, the need for coordination of services already exists — and will grow more acute as budgets tighten. Eleven state agencies participate in public transportation programs, often resulting in duplication and inefficient resource allocations. Yet no single entity, other than possibly the legislature, is responsible and accountable for all transportation services.

Coordinating services is made difficult by the problem of multiple sponsorships inherent in the broader meaning of “state.” The current reality is that agencies operate within their own mandates, often supported by categorical funding sources that restrict opportunities to coordinate. In addition, stakeholder groups have developed around each of the various programs and missions; conflicts over turf restrict coordination opportunities. Coordination is also hindered by multiple reporting and record keeping requirements.

Coordination Issues Also Impact Intermodal Development

Coordination issues also pose a barrier to the development of convenient connections between travel modes.

The federal ISTEA recognizes the importance of intermodalism by making it part of the name of the act and by making federal funds available for intermodal activities. For public transportation and passenger rail to succeed, the component modes must interconnect.

Improving intermodal connectivity has two dimensions. The first is the need for facilities through which modal connections can be made. The second is a system of ticketing, communication, and information, that permits the user to freely move through the connecting modes and services.

Creating a seamless public transportation system wherein users may travel between cities or regions and change modes will require significant attention and coordination. As noted above, what appears to be a single transportation system is in reality many systems, each the responsibility of a different agency, level of government, or private company. It takes a high level of local and regional commitment to arrange timed transfers between several different providers.

There is presently no accountable party other than the state to which citizens can go to address this issue.

How This Plan Addresses These Issues

The plan responds to these challenges by improving transportation choices, connections and coordination. The plan also proposes realistic strategies for addressing our transportation needs and identifies responsibilities for achieving objectives.

Investing in the 20-year vision for public transportation would produce the following:

- Statewide system of services appropriate to each community.
- Balanced transportation system that addresses urban congestion and pollution as well isolation in rural areas.
- A safety net of public transportation services for the citizens of Washington State.
- An infrastructure to support mobility choices including easily obtained fare and schedule information.

Specific objectives for the plan are presented in the following chapter, Policy Development.

How the Policy Planning Process Was Created

In 1988, the Washington State Department of Transportation (WSDOT) initiated a process to develop a comprehensive transportation policy for Washington State. The process, established by the Transportation Commission, promotes the development of policies to achieve a balanced multimodal transportation system.

From 1990 to 1995, the WSDOT Planning Office published annually a State Transportation Policy Plan (STPP). For these plans, the State Transportation Policy Steering Committee — representing many public and private transportation interests — analyzed transportation issues and developed preliminary policy proposals and action strategies. These were taken to the public for review and comment. From the refined policy proposals, the Planning Office developed the Transportation Policy Plan, which was approved by the Transportation Commission and was subsequently presented to the legislature.

The 1990 Policy Plan affirmed the values of independence, opportunity, security, social interaction, equality, and protection of the environment, and strongly supports family, education, and government that represents the people. From these values, the policy plan developed a vision of the future: a transportation system that is fast, safe, efficient, diverse, accessible to all groups of the population, environmentally friendly, integrated with land use planning, and financed through a combination of taxes, user fees, and private contributions.

WSDOT's Mission Statement

Based on its vision of the future, WSDOT adopted the following mission statement:

Provide safe, efficient, dependable and environmentally-responsive transportation facilities and services to promote a positive quality of life for Washington citizens, enhance the economic vitality of all areas of the state and protect the natural environment and improve the built environment.

Six Areas of Transportation Policy

The policy planning process identified six broad areas where transportation policy needed to be developed:

- Personal Mobility
- Working Together
- Transportation Finance
- Environmental Protection and Energy Conservation
- Transportation Support for Economic Opportunity
- Protecting Our Investments

A New Planning Process is Being Developed

The historical policy planning process was used to develop the objectives and action strategies in the *Public Transportation and Intercity Rail Passenger Plan for Washington State*. However, a new process is being developed. The next update of this plan will respond to a new transportation commission policy.

Developing Policies for Public Transportation

The 1992 *State of Washington Legislative Transportation Committee (LTC) Transportation Study* recommended that the state interest in public transportation be articulated through the development of goals and a definition of public transportation.

In February 1992, the STPP Steering Committee formed the Subcommittee on Public Transportation. The subcommittee was chaired by the Director of the Washington State Transit Association and had broad representation by state agencies, legislators, transit agencies, regional planning agencies, and decision makers.

Defining Public Transportation

In 1992, this subcommittee formulated the following definition of public transportation.

A publicly supported system of services and facilities that provides an alternative to the single occupant automobile and enhances mobility, environmental quality, and appropriate land use patterns. Such systems may include any combination of services, facilities, and infrastructure related to transit, paratransit, ridesharing, intercity bus, airport shuttles, passenger rail, ferries, pupil transportation, high capacity transit, transportation demand management, people movers, bicycle and pedestrian programs.

The Public Transportation Goals Were Presented to the Public

Using this definition and working from the six broad areas of transportation policy, 22 public transportation goals were developed and presented to the public in May and June 1992. A survey conducted as part of the public involvement process indicated widespread support for public transportation. Ninety-three percent of survey respondents stated that more people should use public transportation in order to improve air quality and reduce traffic congestion.

Following input from the public involvement process, the subcommittee finalized its recommendations to the STPP Steering Committee and the Transportation Commission approved them in December 1992. The following January, the goals were sent to the legislature as part of the *1993 Report to the Legislature: Transportation Policy Plan for Washington State*.

Policy Statements

The 22 goals were renamed in 1995 as policy statements and are provided below:

- An appropriate level of safe, reliable, and convenient public transportation should be available to all without discrimination or preference based on sex, age, disability, race, religion, ethnic background, or economic status.
- Public transportation should enhance the quality of life for all persons, particularly those with special needs for whom the lack of transportation would otherwise be a barrier to services and social interaction.
- There should be some form of public transportation in all communities of the state.
- Public transportation must conform to the Americans with Disabilities Act (ADA).
- The state shall play an integral role in the development and creation of a statewide public transportation system that is multimodal and linked by intercity services and intermodal facilities.
- Clear roles, responsibilities, and authority of the involved federal, state, regional, and local governments and private sector entities for public transportation programs should be defined.
- Public transportation should be fully integrated into local, regional, and state transportation and land use efforts to ensure efficient coordination of resources.
- Collaborative processes should be established to determine the appropriate levels of service which are responsive to state, regional, and local needs.
- Infrastructure investment decisions should consider public transportation alternatives to determine the most appropriate mix of technology, programs, and facilities.
- Public transportation should maximize the efficient and effective use of available financial resources.
- Public transportation should be financed by a mix of federal, state, local, user, and private sector resources.
- Current financing mechanisms should be maintained.
- Incentives, including flexible funding approaches, should be provided by the state to regional, local, and private sector entities for improving public transportation.
- Public transportation should reduce barriers to travel, enhance access to employment and commercial activities, and stimulate local economies.
- Public transportation should support local economies by providing access to employment, commerce, and services for people who may be geographically isolated.
- Public transportation should contribute to improving air and water quality and to protecting land and other natural resources.

- Public transportation should reduce energy consumption and noise by increasing the use of high-occupancy travel options.
- Public transportation should be sensitive to a community's sense of identity and design.
- Public transportation will continue to invest in its work force to ensure safe, reliable, and convenient transportation.
- Public transportation will be evaluated continually to ensure that appropriate technologies and resources are used effectively.
- Public transportation should be operated and maintained to ensure the security and safety of riders, employees, and facilities.
- Public transportation should implement programs to preserve the needed system.

Objectives for Public Transportation and Intercity Passenger Rail

How Objectives Were Developed

From the policy statements, 12 public transportation and two rail passenger objectives were identified. The objectives underscore the state interest in public transportation and passenger rail including those services, facilities, and programs operated at the state, local, and private sector levels. After draft objectives were developed in the fall of 1993, the public was given the opportunity for comment until late 1994. The Transportation Commission adopted the objectives as part of its approval of the *Preliminary Statewide Multimodal Transportation Plan*, now finalized as *Washington's Transportation Plan*.

Objectives for Public Transportation

The public transportation objectives were developed by the Public Transportation Advisory Committee (PTAC), which convened in June 1993. The PTAC included representatives from a wide variety of government, private, and nonprofit groups. The objectives are organized under four main functional program areas.

Preservation

1. Preserve existing public transportation service levels.
2. Preserve existing public transportation facilities and equipment.

Education and Technical Support

3. Implement state-of-the-art public transportation management to ensure efficient and effective service delivery.
4. Promote the use of public transportation.

Building Partnerships and Planning

5. Build partnerships between federal, state, regional, local, and private sector public transportation entities to improve public transportation planning and coordinate service delivery.

6. Address state public transportation policy in regional and local transportation plans.
7. Facilitate the integration of public transportation in the land use development process, including permitting and environmental impact processes.

Improvement

8. Promote the development of some form of public transportation service in all areas of Washington State for use by the general public.
9. Integrate public transportation services into a coordinated system linked by intermodal facilities.
10. Improve mobility in small urban and rural areas.
11. Public transportation providers will continue to meet ADA and state barrier-free design regulations and improve mobility for the special needs population.
12. Improve and develop urban public transportation services, facilities, and programs, including as options HCT, HOV lanes, and TDM, to respond to growth, and to meet local and regional economic development, congestion, energy, and clean air objectives.

Intercity Rail Passenger Objectives

Objectives Came From Market Research and the Options Report

The WSDOT Public Transportation and Rail Division administers the state intercity rail passenger program. The Rail Office of the Division contracts directly with Amtrak to operate the *Mount Baker International* and *Mount Adams* trains. As part of its interest in preserving existing services, facilities, and equipment statewide, the program coordinates and provides funding for capital improvements in partnership with Amtrak and the private railroads.

The program's two objectives were derived from consumer market research and from the *Options Report* (under separate cover as Appendix C). The Pacific Northwest Rail Corridor Plan Technical Oversight Committee guided the preparation of this document. The rail objectives are provided below.

Objectives

Preservation

1. Preserve and maintain existing service.

Improvement

2. Improve speed, frequency, reliability, and intermodal access of passenger rail service in the Pacific Northwest Rail Corridor (Portland-Seattle-Vancouver, B.C.), and improve the quality of intercity rail service in other corridors statewide.

What's in the Action Plan?

The action plan describes actions that state, regional, and local jurisdictions and organizations should take in the following categories: local transit, paratransit, high capacity transportation, transportation demand management, park and ride lots, intercity bus, and intercity rail. The actions discussed in Chapter 5 provide the basis for costs identified in Chapter 6, Financial Summary.

The first section of this chapter uses a future scenario to show what our lives will be like if these actions are taken — a future with more transportation choices, good intermodal connections, and coordinated services. This section also describes elements of the vision that are already in place.

The second section of this chapter describes some of the actions being planned at the state, regional, and local levels. This is not an exhaustive list, but rather some examples of capital and service enhancements that may be implemented by primarily local and regional investment and actions.

In the third section, Washington State Department of Transportation (WSDOT) action strategies describe what WSDOT should invest in and implement for public transportation and intercity rail passenger services over the next 20 years.

The final section of this chapter briefly discusses local and regional action strategies. These are strategies to be implemented locally.

The Vision — Choice, Connections, and Coordination

WSDOT's vision for public transportation emphasizes improvements in choice, connections, and coordination. If both WSDOT action strategies and local public transportation actions are implemented, the following vision could become reality in Washington State by the year 2016.

Think of the Possibilities . . .

For Terry Traveler of Olympia, tomorrow is a non-telecommute day. Terry must make arrangements to travel the next morning to the primary work site in Seattle for a bi-monthly meeting.

To prepare, Terry opens the WSDOT Home Page on the Internet. The site offers information on traffic conditions for private electric cars, ridesharing match-up, regional commuter rail, intercity rail, and commuter air taxi. Terry chooses the intercity rail because its schedule is compatible and the train offers breakfast as well as laptop computer ports, faxing, and on-board phones.

The intercity rail also has good connections. The local transit shuttle service provides linkage from near Terry's home directly to the rail station. And from Seattle's King Street Intermodal Facility, the walk to the office will be a snap. Terry decides that after the Seattle meeting it would be possible to see another

client over a late lunch on the Kitsap Peninsula, thanks to the quick round trips of the passenger-only ferry. Local transit provides good connections from the ferry terminal to the Kitsap restaurant.

Using voice activation, T. Traveler makes all reservations and pays the fares electronically.

The following morning, Terry catches the transit shuttle to the train station. There's time to eat a good breakfast onboard and catch up on e-mail while the train travels safely and quickly to Seattle. The short walk to the office is pleasant. After the Seattle meeting, Terry uses the ferry trip to the Kitsap Peninsula to finish preparing for the lunch meeting. Back in Seattle, Terry buys a few groceries at King Street Station, knowing that attending to both work and domestic tasks saves a trip, hence avoiding congestion and pollution! Terry uses the personal electronic reader card one last time to access the train for the trip home.

Some Elements of the Vision Are Already in Place

Though this vision may seem improbable today, great strides are being taken to make it a reality. Intercity rail service is currently available and planned improvements and increased frequencies will make the service more convenient and reliable. Several local transit agencies are already making intermodal connections. The state will continue to advocate and assist in the development of intermodal facilities, improved connections, and intermodal coordination. WSDOT already provides highway traffic conditions and Amtrak rail schedules on its Internet site and plans to greatly expand electronic scheduling.

Regional electronic reader cards — called *smart* cards — are being tested in the Puget Sound area. Smart card technology allows travelers to charge a value onto the electronic card; each time the card passes through a reader, the cost of the fare is deducted. Having this technology available across several modes — bus, ferry, commuter rail — would make transfers quicker and more convenient, moving us closer to a seamless transportation system.

Actions Planned for the Future

This section summarizes some of the capital and service preservation and enhancements being planned regionally and locally as well as by the state. This is not an exhaustive list of improvements. More detailed information is available in local transit development plans, regional/metropolitan transportation plans, local comprehensive plans, and transportation improvement programs.



Public Transit

Local public transit agencies face numerous challenges over the next 20 years: population growth (with a high rate of growth in special populations), ADA requirements, increasing congestion, Commute Trip Reduction (CTR) goals — a 35 percent reduction of commute to work trips by 1999 — and deteriorating air quality. To address these challenges, local public transit agencies have developed several strategies.

Preserving Service, Facilities, and Equipment

This strategy emphasizes replacing vehicles and equipment, maintaining facilities, and preserving current operating services and programs.

State and federal mandates including ADA, Commute Trip Reduction (CTR), and the Clean Air Acts (most without any supporting funding) have pressured local transit providers to use their limited resources meeting provisions of specific legislation. In many cases, providers have been forced to withdraw resources from other parts of the system, causing service levels for fixed-route service to suffer. Routes have been eliminated and frequencies have been reduced. For the next several years, resources will be directed at preserving service. During the 20-year period, vehicles will age and fleets will be replaced.

New PTBAs

Over the next 20 years, new transit systems are expected to be formed and implemented in rural areas of the state.

Although the 24 transit authorities currently have boundaries covering an area that includes nearly 85 percent of the population, many rural regions of the state have no public transit service. The Public Transportation and Rail Division of WSDOT has as an action strategy to actively pursue the formation of new PTBAs. The projected population growth rate in rural counties is higher than urban counties, and rural counties such as Garfield, Pacific, Wahkiakum, Clallam, and Columbia have a high elderly growth rate as well. In rural areas it is expected that new community-based, general public demand-response service, linked to larger urbanized areas by adequate intercity bus services, will be initiated.

Annexing New Areas

If ballot measures increase PTBA boundaries, service areas will be expanded to maximize availability and increase choices.

Skagit Transit Authority has recently annexed new areas; a few systems are planning annexation. As the state grows, some existing transit authorities may increase their boundaries to include new populations. These transit systems will purchase additional vehicles, equipment, and facilities and expand operations (additional drivers, marketing, etc.).

Expanding Capacity

The majority of transit agencies are planning to expand services within their present operating area and into the currently unserved portions of their PTBA.

- Community Transit plans to increase inter-county commuter service, daytime frequencies, and late evening and weekend service.
- C-TRAN plans to increase annual transit service hours from 228,442 to 800,000 service hours by 2015. One significant element of the expansion is feeder bus service to serve the planned light rail extension from Portland into Vancouver. C-TRAN also intends to expand both its Seventh Street Transit Center and its headquarters facility.

- Intercity Transit plans to fully meet all requirements of ADA; by 2010 it anticipates operating 25 more vans for Dial-A-Lift service in Thurston County.
- Island Transit plans to provide circulator type service so that rural passengers may link with fixed route.
- Kitsap Transit will increase service frequencies to meet every Washington State ferry and also provide service to the rural areas of the county.
- King County Metro plans to expand existing maintenance and operating bases, and transit centers, as well as construct new facilities in those categories. Metro also plans improvements to incorporate nonmotorized modes into the system.
- Spokane Transit Authority (STA) now extends its downtown trolley service to the Spokane Airport and plans to add more express bus, feeder bus, and fixed-route service. STA recently opened the new downtown transit center; transit service connects this facility to the new Amtrak Intermodal Facility.

Restructuring

Restructuring is an important strategy for meeting the challenges of the next five years and the first part of the 21st Century. Through restructuring, local transit providers can improve frequencies, schedules, and transfer coordination.

Most providers are planning to increase frequencies on major routes. C-TRAN plans to continue making its fixed route service more accessible to the transit dependent (currently a third of fixed routes are accessible). The Regional Transit Authority (RTA) plan calls for local transit to restructure service to feed into RTA stations and increase frequencies for suitable transfers. According to Puget Sound Regional Council's *Metropolitan Transportation Plan*, Metro will restructure to provide a broader variety of destinations, increased frequencies, reduced travel times on routes connecting to important attractors, and improved transfers between fixed and express routes.

Traditional fixed-route transit services will be supplemented with nontraditional services where the former is unproductive. As an example, Seattle's Local Initiative for Neighborhood Circulation (LINC) proposes a transit system which would utilize smaller transit vehicles to pick up passengers at homes or at convenient boarding sites within neighborhoods, and take them to local destinations or to community bus stations where they could catch an express bus. Express bus routes would provide non-stop service between community transit stations, linking downtown Seattle, University District, and other major destinations with fast, reliable service. Community transit stations would be built and designed to be attractive and safe to minimize the inconvenience of transferring between routes.¹

Also in the PSRC area, Pierce Transit intends to reallocate its service to achieve better activity center connections.

¹From Puget Sound Regional Council's *Metropolitan Transportation Plan*, 1995, page 51.

Transportation System Management (TSM) Improvements

Most urban communities and WSDOT are developing TSM strategies to benefit transit movement through highly congested streets and highways. Ramp meter bypasses, freeway flyer stops, bus turnout bays, and exclusive transit access to HOV lanes are examples of TSM improvements that are being made in the Puget Sound region and other urban areas of the state.

Intelligent Transportation Systems (ITS)

ITS refers to advanced technology for improving public transportation system efficiency. ITS technology available to transit includes bus signal preemption, priority freeway access ramps, automated systems for vehicle location, traveler information, etc.

Subsequent to ISTEA authorization in 1991, national and state attention has been directed to the research, development, and implementation of ITS. Some examples of ITS systems applicable to transit include: Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Advanced Vehicle Control Systems (AVCS), Advanced Rural Transportation Systems (ARTS), and Advanced Public Transportation Systems (APTS),

In the Puget Sound region, the North Seattle ATMS is operated between Seattle and Everett along I-5 to detect incidents and enable quick response. WSDOT's Travel-Aid Program on Snoqualmie Pass, which offers trip guidance information to travelers, is an example of ATIS. Many transit agencies are looking at ITS systems like Metro's Automated Vehicle Location (AVL) program.

AVCS may also become common over the next 20 years in Washington. Delco Electronics has developed an AVCS known as Forewarn, an obstacle-avoidance system that utilizes microwave radar to detect an object in, beside, or beneath a bus. ARTS could alert drivers in rural areas to the hazards of snow and ice or allow for quick incident detection.

Smart technologies, such as systems that update transit information about schedules and ridesharing options for travelers, is an example of APTS. In the Puget Sound region, "Smart Bus" technologies will enable transit-vehicle priority and "Smart Cards" will allow travelers to easily move between different modes and transit providers in the region providing the first step towards a seamless public transportation system. Furthermore, several systems are currently utilizing bus priority traffic signalization and over the next 20 years the use of this technology is expected to grow statewide.

Transportation Demand Management (TDM)

TDM refers to strategies encouraging high occupancy vehicle options such as express buses and vanpooling. The urban transit systems are currently utilizing TDM strategies to increase ridership on alternative modes to the automobile. The need for marketing of TDM to increase the use of transit, HCT, HOV lanes, ridesharing, and nonmotorized transportation is expected to grow dramatically as traffic congestion increases.

Paratransit

Paratransit needs are expected to increase substantially during the planning period. The number of persons over the age of 65 is increasing — both in real terms and as a percentage in relation to the general population. The increase in the over-65 group also increases the disabled population. Demand for specialized public transportation services will increase in both urban and rural areas. Since 19 of Washington’s 39 counties currently do not have public transit available, many rural areas are now currently underserved.

Other factors increasing the need for services include the shift of the disabled population from institutional living to community-based group homes and service requirements mandated by the Americans with Disabilities Act.

With the assistance of the Community Transportation Association Northwest (CTA-NW), WSDOT staff estimated paratransit needs based on growth of the senior and disabled populations over the next 20 years. To meet these demands, paratransit providers plan to expand service in new and existing areas and to purchase new vehicles.

Improving Coordination

WSDOT will work with DSHS and other state and federal agencies to develop new program delivery models for improving coordination. Activities will include an assessment of state interest and appropriate roles of the various partners. Legislative proposals will be considered to restructure how programs are delivered.

Developing a Safety Net

WSDOT, CTA-NW, and the Washington State Transit Association will work with communities to develop a safety net of services in underserved areas; this could mean paratransit services or a combination of paratransit and fixed route choices.

To identify the components of a safety net, WSDOT is developing new tools to predict rural demand and evaluate appropriate minimum levels of service. With the greater understanding these tools will provide, paratransit needs may be updated to a higher level. New Public Transportation Benefit Areas (PTBA’s) may be formed.

High Capacity Transportation

Four high capacity transportation systems are being planned in Washington State. The three urban Transportation Management Areas of Central Puget Sound, Spokane, and Vancouver are planning to develop high capacity transportation. In addition, the Thurston Regional Planning Council has identified a need for high capacity transportation in Thurston County.

Central Puget Sound

After analyzing why the first ballot proposal failed last year, Central Puget Sound’s Regional Transit Authority (RTA) developed a revised *Ten-Year Regional Transit System Plan*. This plan which was recently approved by voters emphasizes modal improvements — vehicle expressway, regional bus routes,

commuter rail, and light rail — connected by improved or new facilities. RTA will develop the HOV Expressway in partnership with WSDOT. This involves completing the existing HOV system (closing gaps) with some further expansion and also constructing direct access ramps. The resulting increases in speed and easy access will benefit regional express buses, vanpools, and carpools.

The 81-mile Commuter Rail System would be implemented relatively quickly because much of the infrastructure is already in place. Initially, the Commuter Rail System would serve 14 stations between Everett, Seattle, Tacoma, and Lakewood. (Some of these stations would be shared with Amtrak and WSDOT's *Mount Baker International* and *Mount Adams* intercity trains.) Stopping at stations spaced 4 to 5 miles apart (closer in high employment centers), the 3 to 10 trains per day could carry between 450 and 1,500 passengers.

The trains would use diesel-electric engines to travel at speeds up to 79 mph with an average speed of 35 mph. In the future, trains could be converted to alternative fuels or electric power. To reduce cost, service would initially be during peak hours only. Frequency would be determined by ridership, but would be structured so as not to have adverse impacts on freight movement.

Furthermore, a 16-mile long electric light rail system would be implemented between the University District, Capitol Hill, First Hill, downtown Seattle, Rainier Valley, and SeaTac. A much shorter section would run from the Tacoma Dome to downtown Tacoma. Twenty stations are planned with connections to local bus while some stations will additionally link to regional express buses and commuter rail. The average system speed would be 25 to 35 mph for the electrically powered trains. A train of four to six cars could carry 500 to 700 passengers. The high capacity transportation system may be expanded with voter approval and financial support.

Clark County

In February of 1995, Clark County voters rejected a proposal for the Clark County portion of the South/North Transit Corridor project. The project has been tabled while voters discuss the future of public transit in Clark County. However, the *Draft Environment Study for the South/North Transit Corridor System Plan* still includes the Clark County portion. If at some future date voters approve the proposal, the following description of the project's parameters would be accurate.

Clark County's proposed light rail corridor would begin in Portland, Oregon, at the north end of a new Columbia River crossing (which could be a bridge or tunnel) and extend to an area northeast of downtown Vancouver.

As proposed, the light rail corridor would be double-tracked with crossings grade-separated where appropriate. Some segments in the urban core would consist of a two-way couplet. In other areas, a signal preemption system or protective crossing gates would control at-grade intersections.

The electrically powered trains would operate at 12 to 55 mph. System-wide, the light rail average speed would be approximately 22 mph.

Traveling primarily on exclusive right of way with priority signalization, and stopping at stations spaced .5 to 1.5 miles apart on average, the frequency of proposed service would be consistent with current Metropolitan Area Express (MAX) light rail service in Portland. The maximum passenger capacity per two-car train is estimated to be 332 passengers, including those seated and standing.

If approved, HCT in Clark County would also include feeder bus and arterial-based bus routes with increased frequencies and expanded east–west bus services to supplement the light rail transit. Trunk bus services would operate on interstate and state highway corridors. Depending on travel demands and availability of equipment, some trunk bus services may be replaced with light rail transit.

Spokane County

Spokane County began a Major Investment Study in January 1996. Through this process, which is expected to be finished in mid-1997, the region will make proposals for a HCT system plan. This phase considers land use and transit issues. Beginning late 1997, the second phase will focus on the environmental impact statement and a search for funding sources.

Future HCT corridors have been recommended for four geographic areas: Division Street, Interstate 90, South Valley Arterial, and North Spokane Freeway.

Thurston County

Intercity Transit finished its *HCT Feasibility Study for Thurston County* in August 1995. The study advocates a HCT busway corridor between Olympia and Lacey. It also concludes that HCT service is likely to be needed between Thurston County and Central Puget Sound. Currently, Intercity Transit is in the scoping process for a 20-year HCT System Plan for Thurston County.

A technical advisory team is responsible for identifying facilities and services needed for a HCT system plan, its associated costs and the degree of regional consensus necessary to implement the program.

Transportation Demand Management (TDM)

As transportation corridors within urban areas of the state become more congested, TDM will be increasingly relied on for cost-effective approaches for mitigating growth and environmental concerns. Through Commute Trip Reduction Programs, public education, and least cost planning, TDM is expected to achieve measurable reductions in vehicle miles traveled (VMT) in the next 20 years. According to the Puget Sound Regional Council's (PSRC) *Metropolitan Transportation Plan (MTP)*, the percentage of mode choice for all the Puget Sound region's trips is expected to shift from single occupancy automobiles to alternative modes such as transit and ferries.

Analysis currently being conducted for *the Washington State Ferry System Plan* highlights that even with the addition of seven new ferries within the 20-year planning period, a mode split of 53 percent needs to occur. More ferry-based trips would need to be made via walk on, bicycle or ridesharing. Taking projected growth into account, if personal travel behavior remains the same as today, the ferries will not be able to accommodate all the vehicles.

In addition, on the land-side, transit and vanpools need to improve service capacity and frequency, as well as add more vehicles. WSDOT is evaluating the possible use of land side vans dedicated to destinations within a particular zone. Upon arriving at the ferry dock, ferry travelers would choose the zone van that would serve their destination, for example, a van to Boeing. Transit would also be available for those travelers who could easily reach their destination through convenient schedules. The costs for these land-side improvements have not been included in this plan. However, when the *Washington State Ferry System Plan* is completed, it should include an assessment of the land-side costs.

WSDOT's High Capacity Transportation Office includes the State Commute Trip Reduction Program — previously administered by the State Energy Office — in addition to the TDM Program. The HCT Office will coordinate efforts with WSDOT's Office of Urban Mobility's TDM Resource Center located in Seattle. TDM programs will continue to increase the effectiveness and use of HOV lanes, park and ride lots, vanpools, carpools and high capacity transportation. It is expected to increase the implementation of flexible workday schedules, telecommuting and teleconferencing. TDM will continue to support growth management policies that link land use and transportation so that in the future employees may work out of regional satellite work centers. The continuing goal of TDM is to decrease the use of single occupancy vehicles by encouraging people to reduce the number of trips through trip planning (accomplishing several tasks at one locale), conducting more employee-based work at home and traveling in high occupancy vehicles.

Park and Ride Lots

Recently, WSDOT surveyed statewide park and ride lot needs. Local and regional needs were collected by each WSDOT Regional Office and then integrated into a statewide list of planned park and ride lots. The survey found that over 9,000 spaces need to be added in the next 20 years. The majority of these lots involve new construction while a few are considered expansion/upgrades. Furthermore, park and ride lots needs are currently being assessed in the four regions that are under consideration for high capacity transportation. These are not included in the list total.

In the Central Puget Sound Region, VISION 2020² calls for 20,000 more park and ride lot spaces by 2020. A parking study recently completed for Clark County estimated that by 2015 the daily demand for park and ride will be 2,400 spaces along the proposed South/North Light Rail line. The HCT System Plan for Spokane County also recommended adding park and ride lots along HCT corridors as they are developed. Thurston County is also conducting a park and ride needs assessment as part of its HCT planning efforts.

Park and ride lots will continue to serve as key intermodal facilities. They support linkage by multiple modes and increase ridership for high occupancy travel.

²VISION 2020 is the growth management, economic and transportation strategy for the central Puget Sound area. The Puget Sound Regional Council manages VISION 2020 planning.

Intercity Bus

Private intercity bus carriers will continue to play a vital role in Washington State. Intercity bus links small communities with larger metropolitan areas and serves as the only public transportation mode for many locales across the state. While intercity rail passenger service is provided in three major corridors, intercity bus will continue to supplement rail services in areas that demand greater frequencies and adequate schedule times. Besides being a primary provider, intercity bus serves another important role as a feeder service to other modes of travel. Co-location of transportation services are important to those choosing rail and/or transit and intercity bus service. Customers want fast, one-stop shopping for most services, including transportation. Several carriers are now moving their existing customer, ticketing, and freight operations into the rail based, intermodal stations. This trend is expected to continue.

Furthermore, intercity bus carriers have until 1997 to make all new vehicles (*over-the-road buses*) accessible to persons with disabilities.

Initially, in the first years following the 1997 ADA implementation date, rural communities may see a reduction in service due to the initial high costs of complying with ADA. However, as the private fleets are replaced, the resulting improved service will ultimately benefit the entire community.

Intercity Rail Passenger Service

Over the next 20 years, Washington State expects a growth of almost 2 million people. Intercity travel within Washington is expected to increase by 75 percent causing major transportation corridors to grow even more congested. Having intercity passenger rail service in place will help keep people moving throughout the region — an essential component of economic vitality and quality of life.

Investing in statewide intercity rail passenger system as proposed in this plan will significantly improve service in the Pacific Northwest Rail Corridor and provide some minor improvements to both east/west corridors. Higher frequencies and shorter travel time will improve customer convenience, as will greater reliability produced by scheduling and infrastructure improvements. Increased attention to safety promotion and railroad grade crossing improvements, including some closures, will assure public safety. Continued improvements to rail terminals will provide comfort, convenience, and safety for intercity passengers as well. In addition, Pacific Northwest Rail Corridor passengers now have the choice of using a European-style train — and all the special amenities they offer — or traditional Amtrak equipment. In the future, all Pacific Northwest Rail Corridor trains will be standardized.

The following summary describes the intercity rail passenger preservation and improvements that need to be implemented statewide within the next 20 years. For greater detail regarding proposed improvements in the north-south corridor, refer to Appendix C under separate cover entitled, *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report*.

Pacific Northwest Rail Corridor

The *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report* (also known as the Options Report) incrementally improves the capacity and capability of the rail corridor. The incremental approach proposes that investment occurs in stages or phases rather than all at once. The incremental approach also directs significant investment at improving existing facilities, as opposed to constructing brand new or replacement facilities.

The Options Report proposes to add rail capacity in the major urban areas of the corridor. Some of this capacity could be used for commuter rail services in the Puget Sound region. The intercity rail program will also rely on RTA commuter rail to provide improvements to the corridor. In this rail system partnership, the freight railroads, Amtrak, WSDOT, ports, and commuter rail will share in the costs as well as the benefits.

The new rail capacity would come from improving the railroad infrastructure (track, structures and signals). The Options Report proposes three types of improvements to the infrastructure:

- Improvements to existing trackage to permit increased frequencies and speeds of passenger service and shared use with freight service (shared use trackage) while maintaining safety.
- Construction of new passenger trackage parallel to existing trackage (shared use right of way).
- New passenger bypass routes in key areas of British Columbia, Washington, and Oregon.

The capital improvements should improve running times as indicated in the following table.

PNWRC Scheduled Running Time Assumptions					
<i>(Hours: Minutes)</i>					
<i>Source: Options Report</i>					
	Current Base	Phase 1	Phase 2	Phase 3	Phase 4
Vancouver, B.C. to Seattle	3:55	3:40	3:24	3:13	2:57
Seattle to Portland	3:50	3:17	2:59	2:42	2:30
Portland to Eugene	2:35	2:15	2:00	1:50	1:45
Total Time	10:20	9:12	8:23	7:45	7:12
Phase 1: 2 years from current base Phase 2: 5-6 years from Phase 1 Phase 3: 5-6 years from Phase 2 Phase 4: 5-6 years from Phase 3					

Service levels will also improve by increasing the number of train sets in use from a current four to 15. Each train set will make at least one round trip a day, with some making three round trips per day. The planned increase in service levels is shown in the following table.

Assumed Corridor Service Levels <i>(Daily Round Trips)</i> <i>Source: Options Report</i>						
		Current Base	Phase 1	Phase 2	Phase 3	Phase 4
Vancouver, B.C. to Seattle:	Corridor	1	3	4	5	6
	Long Distance	1	1	1	1	1
Seattle to Portland:	Corridor	2	6	9	12	15
	Long Distance	2	2	2	2	2
Portland to Eugene:	Corridor	1	3	5	6	7
	Long Distance	1	1	1	1	1
Equipment Requirements:	Trainsets	4	7	12	15	15
Long distance train assumptions include the Empire Builder operating between Everett and Seattle, and the Coast Starlight between Seattle and Eugene. The long distance trains are assumed to be daily.						

Ridership in the corridor is expected to grow as a result of a number of factors. Key factors will include frequency of service; the speed of service compared with driving times over short distances and air travel times over longer distances; fares compared to the real or perceived cost of competing modes; and reliability, safety, convenience and attractiveness of service. By the end of the 20-year planning period, ridership is expected to increase by 3.5 to 4.5 million riders per year.

Presently, the Rail Office, WSDOT, is developing the *Pacific Northwest Rail Corridor Programmatic and Project-level EIS*; the EIS is scheduled for completion in 1998. Data from the final EIS will be integrated into a final *Pacific Northwest Rail Corridor Passenger Plan*. Initial project improvements are scheduled for implementation in 1998.

East-West Corridors

Efforts are currently underway by Burlington Northern Santa Fe/Amtrak to raise speeds in the east-west corridors. Currently, WSDOT is not involved in these efforts. As a matter of policy, WSDOT has no plans to add east-west service unless it can be demonstrated that additional service is viable. However, minor track and signal improvements are proposed.

Other Statewide Improvements

Additional improvements are needed statewide. These improvements include promotion for increased ridership and improved safety, and improvements to intermodal facilities and railroad grade crossings (separating, closing, and consolidating crossings).



Improvement of intermodal access and user quality of existing passenger rail terminals statewide is estimated to cost over \$122 million. Bellingham, Olympia/Lacey, Kelso/Longview, Spokane, and Ephrata have completed intermodal stations which facilitate connections between trains and other modes of travel. The Phase I construction has been completed in Centralia. Mount Vernon/Burlington, Everett, Edmonds, Seattle, Tacoma and Pasco currently are designing intermodal facilities and are seeking construction funds. Wenatchee is in the early stages of planning for an intermodal facility. Between Spokane and Vancouver, Washington, no intermodal facilities are currently available. However, Vancouver, Washington has completed the design phase and is waiting for funds to begin construction.

WSDOT's Action Strategies

Public Transportation Strategies (Excluding Rail Passenger)

From the broad picture of objectives for public transportation, the following action strategies will be WSDOT's responsibility to fund and implement.

WSDOT's Responsibilities Versus Local Responsibilities

Local transit agencies have also developed action strategies. The local public transportation action strategies are distinct from the WSDOT strategies in that the local strategies are to be achieved at the local level. Local public transportation action strategies are discussed briefly in the final section of this chapter.

WSDOT's action strategies for public transportation are divided into four categories: preservation, education, building partnerships and planning, and improvements. The numbers (i.e., 1, 2, ...) correspond to the objective number given in Chapter 4. Therefore, 1A and 1B are two different action strategies on how to meet Objective 1.

Preservation

- 1.A. Develop a tool for measuring access levels for public transportation in urban and rural areas.
- 1.B. Ensure adequate funding by enabling local governments to impose local taxes for public transportation services.
- 1.C. Develop a Contingency Assistance Grant Program.
- 2.A. Establish the Public Transportation Facilities and Equipment Management System (PTMS) and develop guidelines for implementation in coordination with regional transportation planning agencies and transit providers.
- 2.B. Preserve corridors that can be used for public transportation purposes such as abandoned railroad tracks and rights of way.

Education and Technical Support

- 3.A. Establish ongoing technical support programs and resources to assist providers, especially small urban and rural systems, and a transportation training program.
- 4.A. Develop and implement a public involvement plan for the state public transportation planning program.
- 4.B. Develop and implement a public education plan for statewide public transportation.
- 4.C. Provide increased financial support for the Public Transportation Conference to facilitate technical assistance, public involvement, and education.
- 4.D. Implement a study/demonstration project which would provide operational and scheduling information for travelers making multimodal, cross jurisdictional trips.

Building Partnerships and Planning

- 5.A. Create an interagency transportation council and planning process to define public transportation roles and responsibilities for state agencies with a particular emphasis on developing coordination opportunities and supporting legislation.
- 5.B. Evaluate the feasibility of transferring the funding and administration of the Department of Social and Health Services Medicaid transportation programs to WSDOT, develop a work program, and implementation plan.
- 5.C. Conduct a survey of airport accessibility by public transportation.
- 5.D. Expand the existing transit reporting system to achieve consistent reporting from all public transportation providers.
- 5.E. Continue a grant program to provide assistance for local public transportation planning and WSDOT required reporting.
- 6.A. Update the State Public Transportation and Intercity Rail Passenger Plan and maintain a planning program that defines the state interest in public transportation and provides ongoing guidance to local and regional planning agencies and public transportation providers.
- 6.B. Create an inter-jurisdictional planning process to develop a multimodal, performance review program to assist local jurisdictions in developing their local public transportation systems.
- 7.A. Survey current environmental review and comment practices by public transportation agencies, make recommendations for involvement, and provide guidance for local and regional planning agencies to use in project approval. Seek legislative remedies if found necessary.

Improvement

- 8.A. Continue to pursue PTBA formation statewide.
- 9.A. Identify a statewide intercity, multimodal public transportation network linked by intermodal facilities.
- 9.B. Conduct a demand survey and analysis for intercity, multimodal public transportation services, define any deficiencies, and determine costs. Prepare a feasibility study regarding the ability to provide financial assistance for capital support for private intercity bus carriers.
- 9.C. Establish a competitive capital grant program for funding preliminary design, land acquisition, and construction/rehabilitation of intermodal transportation facilities and support equipment.
- 9.D. Coordinate the development of feeder bus services to serve the new intercity rail passenger system.
- 10.A. Forecast demand for public transportation services in small urban and rural areas, identify deficiencies and propose solutions and monitor demand every four years.
- 10.B. Assist public transportation providers in coordinating public transportation service in rural areas by supporting multimodal coordination and planning through Regional Transportation Planning Agencies (RTPOs).
- 10.C. Continue the competitive Rural Mobility Grant Program.
- 11.A. Review ADA Plans submitted by the transit agencies, survey plan implementation status, and assess any deficiencies.
- 11.B. Coordinate the development of uniform ADA eligibility criteria to be used by transit providers statewide.
- 11.C. Conduct a Special Needs and ADA Passenger Study: Washington State Trends. This study would identify any impacts that ADA implementation has had on non-ADA eligible individuals with special needs.
- 11.D. Establish an ADA Public Transit Implementation Grant Program for small urban and rural public transportation agencies.
- 12.A. Develop operating and information systems demonstration projects that encourage the use of new technologies.
- 12.B. Develop and implement a statewide plan and grant program for Transportation Demand Management (TDM).
- 12.C. Continue investment in High Capacity Transportation. Leverage federal and local sources with funds from the High Capacity Transportation Account (HCTA) leading to the implementation of High Capacity Transportation in Washington State.

Intercity Rail Passenger Action Strategies

The WSDOT Public Transportation and Rail Division administers the state intercity rail passenger program. The Rail Office of the Division contracts directly with Amtrak to operate the *Mount Baker International* and *Mount Adams* trains. As part of its interest in preserving existing services, facilities, and equipment statewide, the program coordinates and provides funding for capital improvements in partnership with Amtrak and the private railroads.

Preservation

- 1.A. Promote and facilitate the preservation of existing intercity rail passenger service statewide. Promote rail safety, maintain partnerships, and educate the public about the benefits of rail passenger service as a transportation option. Actions include:
 - Partner with Amtrak to preserve existing Amtrak system rail passenger service in the Pacific Northwest Rail Corridor.
 - Promote and facilitate the re-establishment of daily service between Seattle and Spokane via the Empire Builder train.
 - Promote the re-establishment of daily service between Spokane and Portland via the Empire Builder train.
 - Promote public railroad safety by participating in the Operation Lifesaver Education Program and advocate other safety related issues.
 - Develop and implement a public involvement plan for the PNWRC.
 - Educate the public about the role of existing rail passenger services as an alternative transportation mode in congested regions of the state and promote their use through marketing and other public outreach efforts.
 - Maintain existing and establish new partnerships with public, private, and nonprofit organizations at the local, state, federal, and international level.
- 1.B. Continue operation of existing state supported rail passenger services and facilities. Partner with other jurisdictions to provide public safety through grade crossing consolidations, grade separations, closures, eliminations, and pedestrian crossings. Facilitate the development of rail technology to provide additional safety. Actions include:
 - Operate existing rail passenger service between Seattle and Vancouver, B.C., via the Mount Baker International train.
 - Operate existing rail passenger service between Seattle and Portland via the Mount Adams train.
 - Partner with Amtrak and local jurisdictions to maintain existing intermodal facilities.
 - Partner with Amtrak and the private railroads to preserve and maintain capital equipment and infrastructure in statewide rail passenger corridors.

- Work with federal, state, and local jurisdictions and agencies to consolidate, grade separate, or close highway grade crossings throughout the state.
- Work with local jurisdictions to identify, prioritize, and implement pedestrian overcrossings throughout the state.
- Study and demonstrate the application of Positive Train Separation (PTS) technology in the PNWRC.

Improvement

2.A. Promote and facilitate the enhancement of rail passenger service statewide. Actions will include:

- Coordinate with the private railroads, Amtrak, Washington State Utilities and Transportation Commission, Canadian, Provincial, and local jurisdictions to modify track speed restrictions to ensure reduced travel times between Portland/Seattle and Seattle/Vancouver, B.C.
- Implement and refine public involvement, education, and safety programs for the further development of the PNWRC.
- Develop and strengthen partnering strategies between WSDOT, Amtrak, railroads, federal, ports, regional, and local jurisdictions to provide funding methodology for investment actions.
- Advocate and facilitate discussions between Amtrak and local jurisdictions concerning the operation of additional Amtrak excursion service between Seattle and eastern Washington recreation destinations.
- Assist local jurisdictions and Amtrak to determine the viability of additional rail passenger service between Seattle and Spokane and between Portland and Spokane.
- Evaluate and monitor performance of enhanced rail passenger service to determine timing of additional investment to provide for completion of the PNWRC.

2.B. Enhance rail passenger services in the PNWRC between Portland and Vancouver, B.C., by increasing service levels through safely adding frequencies, higher speeds, and reliability. Partner with Amtrak, railroads, ports, federal, local, and regional jurisdictions to provide infrastructure investment in track system capital, intermodal facilities, rolling stock, and operation of trains. Actions will include:

- Improve the rail system between Seattle and Portland to provide for approximate run times of 2:30 and operate a minimum of eight daily corridor round trips, with up to 17 daily corridor round trips depending on incremental performance review and market demand.

- Improve the rail system between Seattle and Vancouver, B.C., to provide service with approximate run times of 3:00 and operate a minimum of four daily corridor round trips, with up to eight daily corridor round trips depending on incremental performance review and market demand.
- Implement advanced technology train equipment within the PNWRC to allow for effective operation of an enhanced intercity rail system.
- Improve the intermodal access and user quality of existing rail passenger terminals and partner with Amtrak and local jurisdictions to construct or remodel new or existing intermodal facilities.
- Conduct Wetland Banking Pilot project to evaluate the potential for wetland banking in the PNWRC.

Local Public Transportation Action Strategies

The majority of public transportation, excluding the state-owned ferry system, is operated at the local level by transit agencies and paratransit providers. However, the state has an ongoing interest in preserving existing services and infrastructure. The state also has an interest in ensuring that local improvements are responding effectively to growth pressures and legislative mandates and to the need for better intermodal connections.

Local Strategies Must Address the State-interest Objectives

Beginning in 1996 in their six-year Transit Development Plans, local transit agencies will identify action strategies describing how they intend to meet the state interest objectives. The local public transportation action strategies are distinct from WSDOT's action strategies in that local strategies are to be achieved at the local level.

Introduction

This chapter contains four sections. The first two sections contain the financial summary for public transportation modes and programs other than intercity passenger rail: section one describes financial needs and section two compares revenue projections with needs.

The chapter's final two sections summarize the financial situation for intercity passenger rail: needs are identified in the third section and projected revenues in the fourth and final section.

The chapter summarizes the total financial needs and projected revenues for public transportation and intercity passenger rail services. The Washington State Department of Transportation (WSDOT) has also identified its own responsibility for meeting transportation objectives and defined those responsibilities through its action strategies. The chapter describes funding needs for WSDOT's action strategies separately from overall statewide needs.

Financial Needs for Public Transportation (Excluding Passenger Rail)

Public Transportation Needs Assessment

In 1994, WSDOT conducted a needs assessment for the period 1994-2013. Participants in the needs assessment included the WSDOT, Washington State Transit Association, Community Transportation Association Northwest, Washington State Department of Social and Health Services, Regional Transit Authority, Spokane Regional Transportation Council, and all 24 transit systems.

Needs, revenues, and unfunded needs were identified for five public transportation categories: transit, paratransit, high capacity transportation, park and ride lots, and WSDOT action strategies.

The needs identified in this chapter are based on the 1994 needs assessment. The needs data have been updated and three extra years added to the projections to make a 20-year projection starting in 1997 and ending in 2016. All cost and revenue figures are in 1995 constant dollars.

The cost of needs is discussed first in terms of statewide public transportation and then by more specific functional programs.

Total Needs for Public Transportation

Total needs for public transportation are \$29 billion. Of that amount, 71 percent of the costs are associated with transit. Needs for local transit — traditional bus service, paratransit, and vanpool programs — include all transit services, programs, and facilities.

High Capacity Transportation is the next largest category with 14 percent of total needs. (WSDOT has its own action strategy for HCT; those HCT costs are included in the WSDOT action strategy category rather than the HCT category.) Paratransit needs — 12 percent of total needs — refer to the costs of the DSHS Medicaid Program and to paratransit needs in largely rural areas not served by transit. The figure of \$38 million (one tenth of a percent of total) for Park and Ride Lots comes from the WSDOT Park and Ride Lot Improvement list. WSDOT Action Strategies are about 3 percent of total needs.

The following table presents needs by statewide public transportation mode and program.

Public Transportation Needs (Millions of Dollars)		
Public Transportation Mode or Program	Needs	Percent
Transit	20,772	71.0
Paratransit	3,473	11.9
High Capacity Transportation	4,195	14.3
State Park and Ride Lots	38	0.1
WSDOT Action Strategies	779	2.7
Total	29,257	100.0

Based on each agency’s own projections, transit and paratransit needs grow steadily during the planning period. Transit needs grow from a low of \$766 million to \$1.4 billion in 20 years, and paratransit needs grow from \$52 million to \$213 million. High Capacity Transportation (HCT) needs are expected to vary over the planning period due to higher up-front costs of constructing a light rail system. Park and ride lot needs vary depending on construction scheduling. State action strategy needs range from a high of \$21 million to a low of \$13 million in the last years of the planning period.

Needs by Program

The Public Transportation Needs Assessment also organized statewide public transportation needs into program categories.

- **Preservation** — Operating and capital replacement costs of existing systems.
- **Education and Technical Support** — Costs associated with providing public education and technical support to public transportation providers.
- **Building Partnerships and Planning** — Costs associated with preparing and updating public transportation plans, conducting special studies, and improving interagency coordination.
- **Improvement** — Service expansion, technological enhancements and new construction costs.

Figures for preservation and improvement include statewide public transportation needs. Preservation accounts for 68.6 percent of total needs while improvement accounts for 31.3 percent. More than half of the improvement category is for High Capacity Transportation (\$4.6 billion). HCT planning costs were included in the improvement category, since they are embedded in overall HCT development costs.

The categories of “education and technical support” and “building partnerships and planning” only reflect needs from WSDOT action strategies. These two categories together account for less than 0.1 percent of total needs for public transportation.

Statewide Public Transportation Program Needs (Millions of Dollars)		
Program Category	Needs	Percent
Preservation	20,080	68.63
Education and Technical Support	9	0.03
Building Partnerships and Planning	11	0.04
Improvement	9,157	31.30
Total	29,257	100.00

This table shows financial needs by statewide public transportation mode or program.

Needs for WSDOT’s Action Strategies

The majority of public transportation is provided locally and the needs identified in the needs assessment are largely a local responsibility. However, WSDOT also has a responsibility for meeting transportation objectives; the state’s responsibility is expressed through its action strategies and their funding needs of \$779 million. The cost of the state-responsibility action strategies amounts to about 3 percent of the total needs for public transportation (excluding passenger rail services). The following table provides details of the cost for implementing WSDOT’s action strategies.

WSDOT Public Transportation Program Action Strategies (Thousands of Dollars)		
Program Category	Strategy	Cost
<i>Preservation</i>		
Development Access Measure	1A	314
Ensure Adequate Funding	1B	-0-
Contingency Grant Program	1C	9,414
Establish PTMS	2A	86
Preserve Corridors	2B	4,707
<i>Education and Technical Support</i>		
Technical Support and Training	3A	2,354
Public Involvement	4A	881
Public Education	4B	4,106
Public Transportation Conference	4C	659
Electronic Public Information Demo	4D	837
<i>Building Partnerships and Planning</i>		
Interagency Coordinating Council	5A	3,766
WSDOT/DSHS Transfer Study	5B	209
Airport Accessibility	5C	105
Expand Reporting	5D	418
Local Planning Assistance	5E	2,092
State Public Transportation Planning	6A	2,090
Performance Review Program	6B	1,883
Public Transportation/Land Use Integration	7A	262
<i>Improvement</i>		
PTBA Formation	8A	-0-
Intercity Multimodal Transportation Network	9A	105
Intercity Bus Deficiencies Study	9B	366
Intermodal Facilities Grant Program	9C	104,603
Feeder Buses for Rail	9D	418
Demand Forecasting	10A	366
RTPO Public Transportation Coordinating Comm.	10B	314
Rural Mobility Grant Program	10C	104,603
ADA Plan Review & Assessment	11A	-0-
Uniform ADA Eligibility Criteria	11B	105
Special Needs & ADA	11C	314
ADA Implementation Grant	11D	10,460
Total		255,834
WSDOT High Capacity Transportation Program Action Strategies		
Program Category	Strategy	Cost
<i>Improvement</i>		
Operating and Information Systems Demo	12A	732
TDM Grant Program	12B	122,000
HCT Capital Grant Program	12C	400,000
Total		522,732
Total WSDOT Public Transportation Program and HCT Program Action Strategies		778,566

Revenue Projections for Public Transportation (Excluding Passenger Rail Services)

A Brief Word About Sources of Revenue

Transit revenues come from the motor vehicle excise tax (MVET), sales tax, business and occupation tax, household tax, fares, other internal income (e.g., interest), other state income, borrowing, and federal grants. Paratransit revenues come from federal, state, and local sources. These sources include federal and state grants, state general fund (e.g., DSHS), transit revenues budgeted for paratransit operations, fares, and local and private funding.

For more detailed descriptions of revenue sources for public transportation, refer to Appendix A.

How Were the Revenue Projections Developed?

Public transportation revenue projections, like the needs projections, are based primarily on the 20-year Washington State Public Transportation Needs Assessment (1994) as updated for the planning period.

The following sections present the revenue projections for transit and for the other public transportation modes and programs. These will be compared to needs. The difference between projected needs and revenues — the unfunded needs — are calculated for each mode.

Three revenue scenarios have been developed for transit. For public transportation modes other than transit, the only available revenue estimates come from the agencies themselves.

Transit's Projected Revenues Compared With Needs

Scenario 1 for transit is based on revenues estimated by the transit agencies themselves. Scenario 2 assumes that the current level of revenues will be maintained without further growth; this *current law* scenario projects revenues very close to those estimated by the transit agencies. Scenario 3 assumes that historical trends in revenue collection will continue, through tax increases or by developing other resources, resulting in higher revenues than those projected by the transit agencies.

Of the three scenarios estimating future revenues for transit, the lowest projection comes from the transit agencies' own forecast (from the 1994 Public Transportation Needs Assessment). Under this scenario, total revenues for the 20 year period will be \$14.31 billion, leaving an unfunded need of \$6.46 billion. Scenario 2 is very close to the transit agencies' forecast, estimating revenues of \$14.64 billion and unfunded needs of \$6.13 billion for the 20-year time period. Scenario 3, based on historic trend lines continuing, projects revenues as high as \$17.46 billion, leaving an unfunded need of only \$3.31 billion. The following graph compares the scenarios.

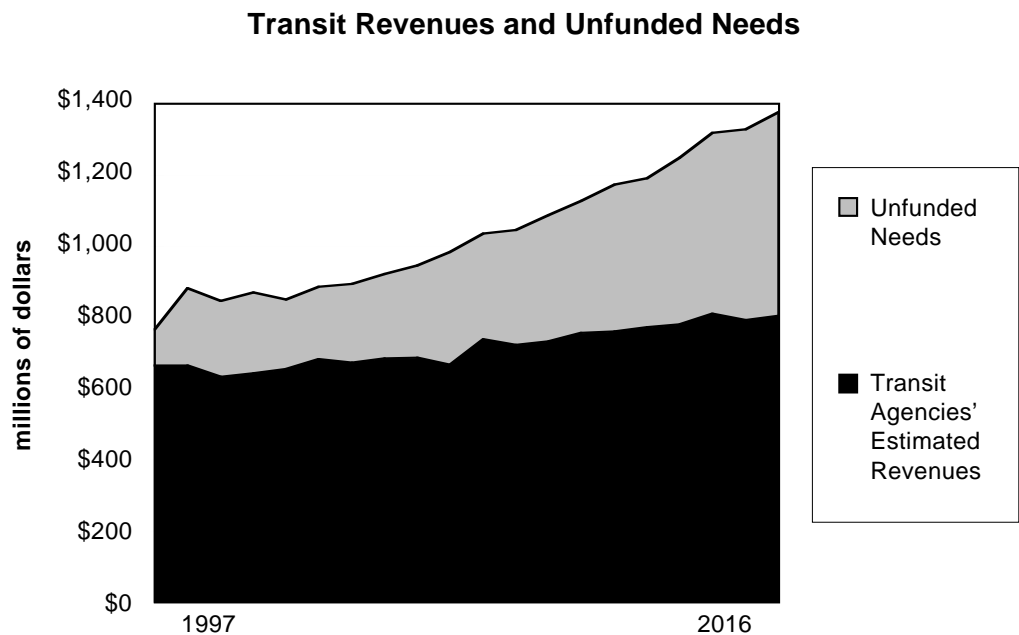
Transit Review Scenarios



Depending on the revenue scenario, 16-31 percent of transit needs will remain unfunded in the next 20 years. Only if the historic trend (of revenue increases) continues will the shortfall be as low as 16 percent. The transit agencies’ own estimates, as well as the current law projection, both anticipate a much higher shortfall of 31 percent and 30 percent respectively. The following table compares the three scenarios for the planning period.

Transit Revenue Scenarios (Millions of Dollars)		
Revenue Scenario	20-Year Sum	Percent Unfunded
Total Needs	20,772	
1. Transit Agencies’ Estimated Revenues	14,312	
Unfunded Needs	6,460	31.1
2. Current Law Revenues	14,645	
Unfunded Needs	6,127	29.5
3. Historical Trend Revenues	17,463	
Unfunded Needs	3,309	15.9

The following figure shows how unfunded needs increase during the 20-year planning period if revenues follow the transit agencies' estimated revenues. Costs continue to increase while revenues increase slightly.



Paratransit's Needs Versus Revenues

Paratransit organizations projected that their 20-year needs of \$3.5 billion will be largely funded. The assumption that there will be no unfunded needs for the DSHS Medicaid Program is based on the current trend. If federal dollars are cut, projections for future unfunded needs will need to be adjusted.

At present, paratransit has a shortfall of \$77 million for the 20-year period. The unfunded needs come from paratransit services outside of the DSHS Broker Program in largely rural areas. Federal Title 19 and the State General Fund each provide 50 percent of the DSHS Medical Assistance Broker Program. The Older Americans Act, Federal Transit Act of 1992, and Social Services Block Grant Program are possible sources of revenue for non-transit agencies that provide paratransit service.

High Capacity Transportation's Needs Versus Revenues

The High Capacity Transportation need of \$4,195 million (excluding the WSDOT action strategy for HCT) is currently unfunded and will need to be provided by local and federal revenue sources. The need for local and federal funds is highest during the construction phase. The likelihood of finding full funding for High Capacity Transportation in the near term has been affected by prior rejections of proposals in Clark County and the Puget Sound area. RTA's *Ten-Year Regional Transit System Plan* is set to go back to the voters in November 1996. If approved, local dollars will become available for construction.

Park and Ride Lot Needs

No funding is identified for park and ride lots, leaving the needs of \$38 million currently unfunded.

WSDOT Action Strategy Needs and Revenues

Costs for WSDOT’s Public Transportation and High Capacity Transportation action strategies are \$779 million, of which \$523 million is for the High Capacity Transportation Program. Of this, WSDOT has a target of funding \$400 million of the High Capacity Transit needs in the state. The other \$123 million in needs is mainly for the Transportation Demand Management Program. The only revenue identified is \$153 million for High Capacity Transportation. Of the Public Transportation action strategies, the only funded program is a portion of the Rural Mobility Program with \$16 million in revenues. Thus, of the needs of \$779 million for the WSDOT Action Strategies, only \$169 million is funded; the unfunded needs are \$610 million for the planning period.

Summary of Projected Revenues and Unfunded Needs

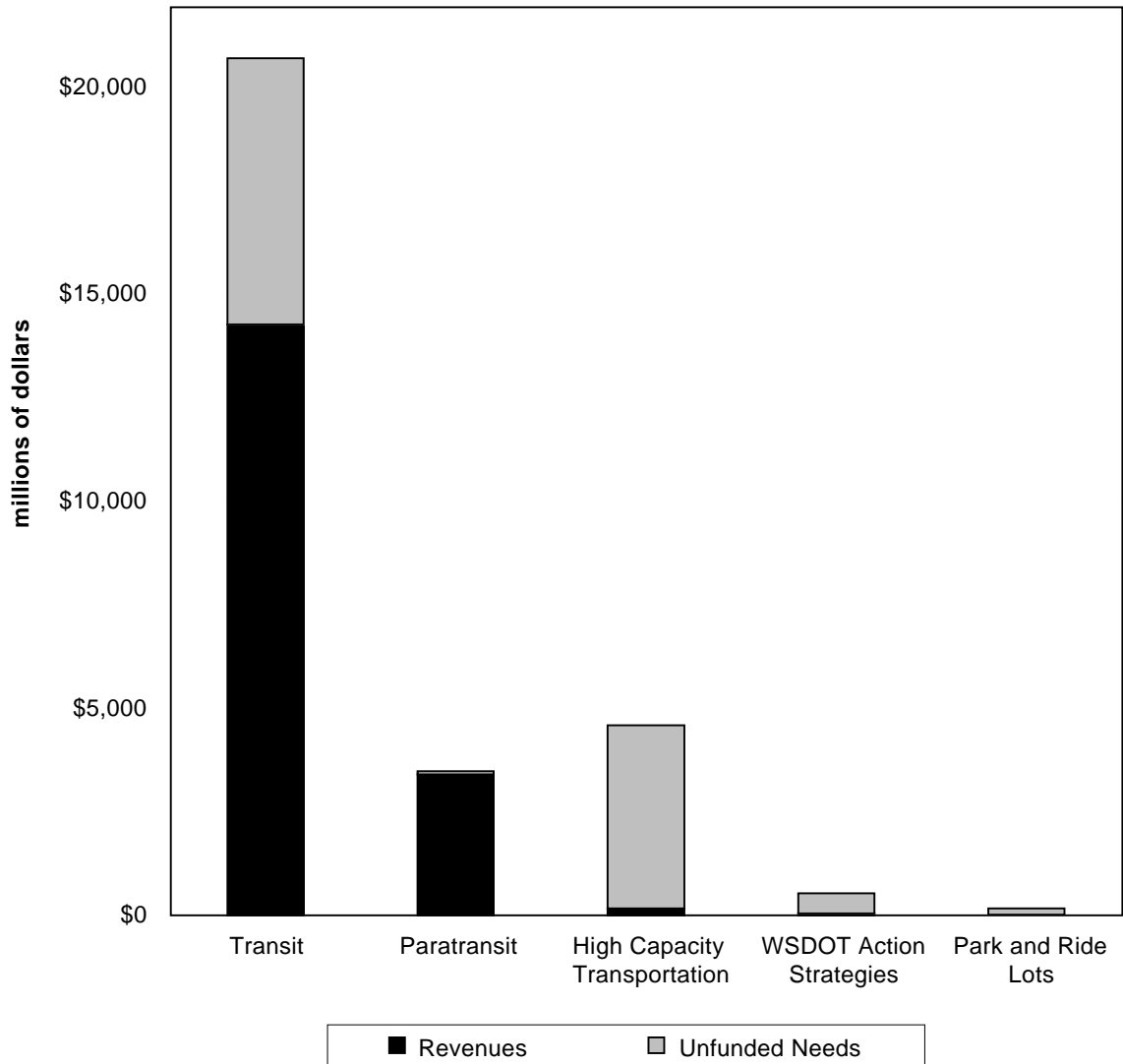
Summarizing, transit is expected to be 69-84 percent funded and paratransit is almost fully funded, but the other programs — WSDOT Public Transportation Action Strategies, high capacity transportation, and the park and ride lots — all have severe funding shortages.

The following table gives an overview of statewide public transportation unfunded needs by mode or program. Total public transportation revenues are projected to be \$17.9 billion for the 20-year planning period, leaving unfunded needs of \$11.3 billion. Of these \$11.3 billion in unfunded needs, transit accounts for 57 percent of the total, paratransit accounts for less than 1 percent, high capacity transportation for 37 percent, WSDOT action strategies 5 percent and park and ride lots less than 1 percent.

Financial Summary by Mode or Program (Millions of Dollars)				
Mode or Program	Costs	Revenues	Unfunded Needs	Percent Unfunded
Transit	20,772	14,312*	6,460	31.1
Paratransit	3,473	3,396	77	2.2
High Capacity Transportation	4,195	0	4,195	100.0
Park and Ride Lots	38	0	38	100.0
WSDOT Action Strategies	779	169	610	78.3
Total	29,257	17,877	11,380	38.9
*Revenues estimated by the transit agencies.				

The following bar chart graphically compares needs and revenues for transit, high capacity transportation, paratransit, park and ride lots, and WSDOT action strategies.

Public Transportation Needs and Revenues



Financial Needs for Intercity Passenger Rail

Needs for the Pacific Northwest Rail Corridor have been taken from the *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report*, published December 1995. The report outlines different options for establishing frequent, higher speed passenger rail services between Eugene, Oregon, and Vancouver, British Columbia, in the next 20 years.

Data for the east-west corridors have been provided by WSDOT Rail Office studies.

Total needs statewide for intercity passenger rail are projected to be \$2,907 million for the 20-year planning period. The majority of needs are associated with the development of the Pacific Northwest Rail Corridor. The relatively small needs identified with the two east-west corridors, Seattle/Spokane and Spokane/Portland, relate to minor infrastructure improvements.

In the table below, intercity passenger rail needs are separated into two categories: (1) WSDOT Intercity Rail Passenger Program action strategies, and (2) Private/Amtrak/Oregon/BC/Others. This second category identifies the total cost of needs to be met by others outside of the WSDOT program. Cost figures include assumptions about fare-box recovery and shares of capital and operating expenses to be paid by Washington and others, including Oregon, British Columbia, Amtrak, local agencies, private railroads, and train riders. The cost of both operating and capital improvements are expected to be shared.

The costs for WSDOT action strategies comprise 43 percent of the total needs of \$2,907 million. The remaining 57 percent is expected to be covered by other interests in primarily the Pacific Northwest Rail Corridor.

Statewide Intercity Passenger Rail Needs (Millions of Dollars)	
Category	Needs
Private/Amtrak/Oregon/BC/Others	1,644
WSDOT Action Strategies	1,263
Total	2,907

Twenty-year needs are also provided by functional program category. In the table that follows, needs are separated into preservation and improvement.

Preservation includes: (1) advocacy to promote rail safety, maintain partnerships and public education; and (2) investment to continue the operation and maintenance of existing state supported rail services and facilities and partnership with jurisdictions to promote rail safety. Preservation needs comprise 17 percent of the total needs of \$2,907 million.

The majority of needs fall into the improvement category at 83 percent of the total. Improvement needs include: (1) advocacy to promote the enhancement of rail service statewide, conduct interagency coordination and public education; and (2) investment to enhance passenger rail services in the Pacific Northwest Rail Corridor by increasing service levels through safely increasing frequencies, higher speeds and reliability. Furthermore, investment involves partnerships with Amtrak, freight railroads, ports, federal, regional and local jurisdictions to provide capital improvements in intermodal facilities, rolling stock, signalization, and trackage.

Statewide Intercity Passenger Rail Needs by Functional Program (Millions of Dollars)	
Functional Program	Needs
Preservation	507
Improvement	2,400
Total	2,907

WSDOT's Action Strategies — The Cost Broken Out by Strategy

WSDOT share of the costs for implementing statewide intercity passenger rail services represents less than half of the total costs. The action strategies summarize how WSDOT will meet its objectives. The table below provides a short description of each strategy and its associated cost. (Chapter 5 contains more detailed descriptions of the strategies.)

WSDOT Intercity Rail Passenger Program Action Strategies (Thousands of Dollars)		
Program Category	Strategy	Cost
<i>Preservation</i>		
Promote and facilitate preservation of service	1A	20,200
Continue operation of existing service and facilities	1B	172,500
<i>Improvement</i>		
Promote and facilitate enhancement of service	2A	24,000
Enhance service by capital and operating improvements	2B	1,046,700
Total		1,263,400

Revenue Projections for Intercity Passenger Rail

The revenue projections for intercity passenger rail are based on estimates made by WSDOT Rail Office studies. These estimates integrate revenues projected in the *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report* with figures generated from policy direction concerned with preserving and enhancing the two east-west corridors.

Current and Potential Sources of Revenue

Currently, WSDOT’s Rail Passenger Program relies mainly on appropriations from the Washington State Transportation Fund, which totals \$33.7 million for the 1995-1997 biennium. In addition, the passenger rail program has received federal funding: \$1.5 million from ISTEA and \$.75 million from the Federal Railroad Administration. This brings total revenues for the biennium to \$36 million.

For more information about current and potential project funding for intercity passenger rail, refer to Appendix A or to the Options Report, published under separate cover as Appendix C.

Summary of Revenue Projections and Needs

Currently, there is no dedicated funding for WSDOT’s Intercity Rail Passenger Program. Due to the short existence of the program, historical data are insufficient to establish a trend. During the 1995-1997 biennium, \$36 million has been budgeted for the program. However, because no future budget level has been set, no reliable revenue figures can be projected.

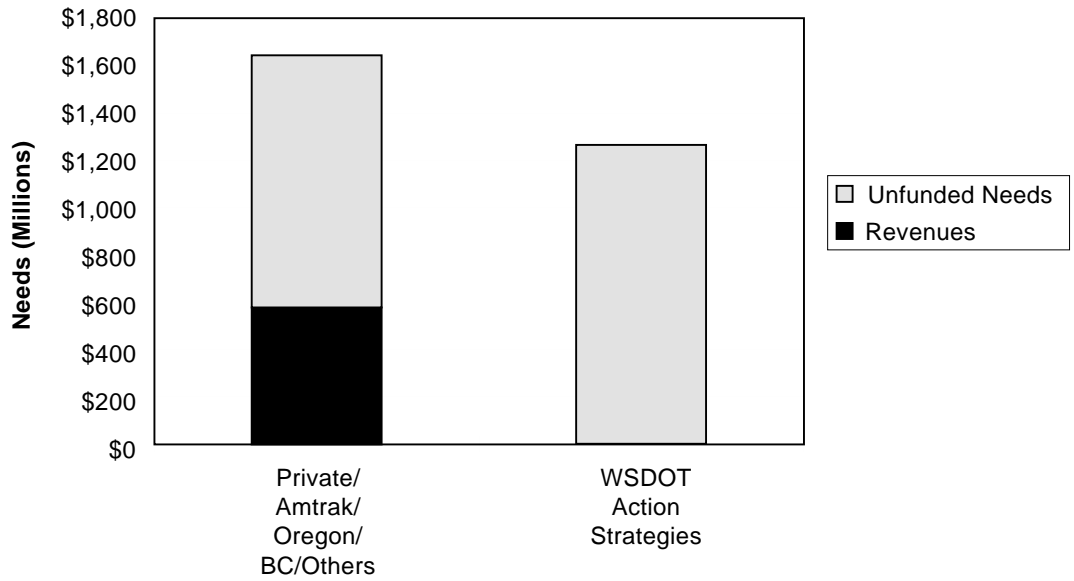
At present, the only revenues that may be projected are from fares and food and beverage concessions. As the state’s contracted operator, Amtrak collects these revenues; they are credited against the cost of service. Continuing existing service would generate revenues of \$85 million while enhanced service is expected to bring in additional revenues of \$491.8 million.

For the Private/Amtrak/Oregon/BC/Others category, 65 percent of its needs are unfunded; dedicated revenue sources have not been identified. For the WSDOT Intercity Rail Passenger Program, the shortfall is 100 percent. Keeping this important transportation program viable will require shifting existing revenues towards the WSDOT Rail Office program and/or finding new revenue sources. For the statewide 20-year program to succeed, all stakeholders must form a strong partnership and financial commitments must be made at the federal, local and private levels, as well as by the state.

Intercity Rail Passenger Service Projected Revenues and Unfunded Needs (Millions of Dollars)				
Category	Costs	Revenues	Unfunded Needs	Percent Unfunded
Private/Amtrak/Oregon/ BC/Others	1,644	577	1,067	65
WSDOT Action Strategies	1,263	0	1,263	100
Total	2,907	577	2,330	80

The following bar chart summarizes the statewide passenger rail needs, revenues, and unfunded needs.

**Intercity Passenger Rail Service
Statewide Needs, Revenues and Unfunded Needs
(Needs = Revenues + Unfunded Needs)**



Multimodal Trade-offs in Washington's State Transportation Plan

The previous chapter identified needs and projected revenues for the next 20 years for public transportation and intercity passenger rail. It is evident that there is a substantial shortfall in all public transportation modes in the state. Furthermore, *Washington's Transportation Plan (WTP)* determined that needs for all transportation modes exceed currently available revenue. Achieving the multimodal service objectives will require more than \$104 billion in 1995 dollars. With projected revenues totaling no more than \$46 billion, a significant number of action strategies within the objectives will remain unfunded unless new sources of revenue are found. This shortfall is due in part to current revenue sources that have been unable to keep pace with inflation (i.e., gas tax) and to the increasing demand for additional and improved transportation services and facilities.

Difficult decisions must be made as to what needs are to be funded. The state may wish to pursue additional sources of revenue, such as an increase in the gas tax. The Multimodal Trade-off process was developed to assist decision makers in choosing what needs to meet within the various transportation modes.

Developing a Funding Scenario

Several transportation revenue scenarios were analyzed: fully funding the plan; funding the service objectives at the historical rate of tax increases; and funding the service objectives with no increased taxes. The Transportation Commission selected the midline scenario — using historical trend — for its funding baseline.

Then each mode prioritized its objectives and action strategies, identifying those high-ranked objectives and strategies that fit under the historical trend line. This funding scenario functions well with modes that have a long upward trend line. However, it works less successfully with transportation modes that are new to the scene like high capacity transportation and intercity passenger rail. Both have a funding history that started with the previous biennium. It has been suggested that since these modes relieve congestion they could replace some of the needs of the traditional modes (i.e., highways).

Strategies for Increasing Revenue

One strategy the Transportation Commission could use would be to support these up and coming transportation services and modes, shifting emphasis toward a more multimodal, intermodal transportation system. The time has come to ask whether discretionary funds, such as the Motor Vehicle Excise Tax (MVET) should be earmarked for any one mode solely because the funds have been used for that purpose in that past. Transportation is not static; it is advancing technologically and new solutions need to be found for critical problems like congestion.

To increase revenue for public transportation including high capacity transportation and intercity passenger rail, decision makers could: (1) shift some of the available revenue from other transportation modes to public transportation and rail; (2) support a gas tax increase which would allow some existing funds (i.e., MVET) to pass to alternative modes; (3) support some new revenue source; and (4) use any combination of the above.

Survey Found Support for Public Transportation¹

Faced with a funding shortfall for all modes of transportation, the Transportation Commission asked the citizens of Washington to respond to a survey regarding their priorities and willingness to pay for transportation improvements. Three strong messages emerged from the survey results:

1. Continue to take care of what we already have, improve safety, and meet our environmental responsibilities. Over 80 percent of survey respondents agreed with these investments as top priority.
2. Take a balanced approach to meeting the freight and people mobility needs of our growing state, recognizing that the right solution may vary by region of the state. Across the state, public transportation, high capacity transit, and intercity passenger rail were rated as high priority investments. Some regional priorities, such as additional ferry service in Kitsap County and support for expanded roadways in central and eastern Washington, emerged as an important part of the mix.
3. Increase transportation taxes to pay for these priority improvements. An overwhelming 76 percent supported either fully funding the plan or pegging transportation investment to keep up with inflation and growth. This was a high response considering that respondents knew how much the revenue scenarios would cost them individually. Only 7 percent of respondents supported keeping current transportation tax rates, which would mean that some existing transportation services would not be maintained.

The Transportation Commission's Funding Targets

Based on the survey results, the Transportation Commission assessed the proposed plan objectives and established 20-year funding targets for each mode and program. These targets are summarized in Tables 1 and 2. Two basic methods were used to set these targets:

1. For traditional transportation modes (i.e., highways, ferries, and public transportation), targets were set at levels that are consistent with long-term, historical expenditure trends.
2. For transportation modes where state public investment is relatively new (i.e., intercity passenger rail, high capacity transit, and freight rail), targets were based on achieving specific improvements. For example, the target for intercity passenger rail will provide a mix of track, train, and operating improvements in the Pacific Northwest Rail Corridor that will significantly improve travel speeds and train reliability.

¹This section is mostly taken from the WTP.

TABLE 1
Washington's Transportation Plan (1997 - 2016)
(1995 Million Dollars)

Note: All figures rounded to the nearest million dollars

Funding the WTP Targets						
	Service Objective Needs	WTP Target	State	Federal	Local	Private and Other
State Highways						
Maintenance	2,440	2,440				
Traffic Operations	410	410				
Preservation	4,000	4,000				
Imp - Safety	2,000	2,000				
Imp - Econ Init	1,360	1,360				
Imp - Env Retro	790	790				
Imp - Mobility	14,490	6,140				
Total	25,490	17,140	11,540	5,600	0	0
County Roads	23,000	Needs are shown for comparative purposes only. The Commission did not establish WTP Targets for these areas.				
City Streets	12,300	Needs are shown for comparative purposes only. The Commission did not establish WTP Targets for these areas.				
Private Vehicle Operations	Represents private costs of owning and operating motor vehicles					210,000
Ferries						
Maintenance and Operations	Service objective costs under development.	2,300				
Preservation		1,010				
Improvement		540				
Total	3,850	3,850	3,750	100		
State Airports						
Maintenance	1	1	1			
Preservation	Costs included in Maintenance above.					
Improvement	2	2	2			
Total	3	3	3			
Public Transportation						
Preservation	20,080	20,080	1,578	2,579	15,923	
Local Public Transit	16,939	16,939		1,016	15,923	
Paratransit	3,126	3,126	1,563	1,563		
State Public Transp. Program	15	15	15			
Education / Tech. Support	9	9	9			
Build. Partnerships / Plan.	11	11	11			
Improvement	9,157	5,848	879	166	4,803	
High Capacity Transit	4,595	4,595	400		4,195	
Local Public Transit	3,871	562		31	531	
Paratransit	347	347	135	135	77	
State Public Transp. Program	344	344	344			
Totals						
Local Public Transit	20,810	17,501	0	1,047	16,454	0
Paratransit	3,473	3,473	1,698	1,698	77	0
High Capacity Transit	4,595	4,595	400	0	4,195	0
State Public Transp. Program	379	379	379	0	0	0
Total	29,257	25,948	2,477	2,745	20,726	0
Intercity Passenger Rail						
Preserve Existing Service	507	507	193	135	20	159
System Completion	2,400	2,400	1,071	60	60	1,209
Total	2,907	2,907	1,263	195	80	1,368
Freight Rail						
Mainlines and Terminals	2,646	2,646	282	0	364	2,000
Branchline Preservation	501	501	201	0	0	300
Corridor Preservation	15	15	14	0	1	0
Total	3,162	3,162	497	0	365	2,300
Non-motorized						
Local Needs	1,600	1,600	0	0	1,600	0
State Advocacy	5	5	5	0	0	0
Total	1,605	1,605	5	0	1,600	0
Aviation						
General Aviation	267	267	96	131	40	0
Air Carrier	1,168	1,168	1	916	251	0
Aviation Safety	4	4	4	0		
Emergency Response	6	6	6	0	0	0
Regulation	4	4	4	0	0	0
Total	1,449	1,449	110	1,047	291	0
Marine Ports and Navigation						
Port and Other Costs	827	827		580	247	Unknown
State Advocacy	20	20	20			
Total	847	847	20	580	247	
Grand Total	103,870	56,911	19,666	10,267	23,309	213,668

TABLE 2
WSDOT Share of WTP Targets
(1995 Million Dollars)

Note: All figures rounded to the nearest million dollars

Sources of Increased Revenue

	WTP Targets	WSDOT Share of WTP Targets (State and Fed. Funds)	Funded With Current Revenues	Increased Revenue Needed	State Funds	Federal Funds	Other Funds
State Highways							
Maintenance	2,440	2,440	Current revenue amounts not determined for these program areas.	7,240	5,940	1,300	0
Traffic Operations	410	410					
Preservation	4,000	4,000					
Imp - Safety	2,000	2,000					
Imp - Econ Init	1,360	1,360					
Imp - Env Retro	790	790					
Imp - Mobility	6,140	6,140					
Total	17,140	17,140	9,900	7,240	5,940	1,300	0
County Roads							
Needs are shown for comparative purposes only. The Commission did not establish WTP Targets for these areas.							
City Streets							
Represents private costs of owning and operating motor vehicles							
Vehicle Operations							
Ferries							
Maintenance and Operations	2,300	2,300	2,300	0	0	0	0
Preservation	1,010	1,010	1,010	0	0	0	0
Improvement	540	540	540	0	0	0	0
Total	3,850	3,850	3,850	0	0	0	0
State Airports							
Maintenance	1	1	1	0	0	0	0
Preservation	0	0	0	0	0	0	0
Improvement	2	2	0	2	2	0	0
Total	3	3	1	2	2	0	0
Public Transportation							
Preservation	20,080	15	Revenues not separated by program.	15	15	0	0
Education / Tech. Support	9	9		9	9	0	0
Buid. Partnerships / Plan.	11	11		11	11	0	0
Improvement	5,848	744		744	744	0	0
Baseline		138		138	0	0	0
Total	25,948	916	138	779	779	0	0
Intercity Passenger Rail							
Preserve Existing Service	507	193	193	0	0	0	0
System Completion	2,400	1,071	207	863	863	0	0
Total	2,907	1,263	400	863	863	0	0
Freight Rail							
Mainlines and Terminals	2,646	282	0	282	282	0	0
Branchline Preservation	501	201	10	191	191	0	0
Corridor Preservation	15	14	10	4	4	0	0
Total	3,162	497	20	477	477	0	0
Non-motorized							
Local Needs	1,600	0	0	0	0	0	0
State Advocacy	5	5	5	0	0	0	0
Total	1,605	5	5	0	0	0	0
Aviation							
General Aviation	267	96	76	20	20	0	0
Air Carrier	1,168	1	1	0	0	0	0
Aviation Safety	4	4	4	0	0	0	0
Emergency Response	6	6	6	0	0	0	0
Regulation	4	4	4	0	0	0	0
Total	1,449	110	90	20	20	0	0
Marine Ports and Navigation							
Port and Other Costs	827	0	0	0	0	0	0
State Advocacy	20	20	5	15	15	0	0
Total	847	20	5	15	15	0	0
Grand Total	56,911	23,805	14,409	9,396	8,096	1,300	0

Partners in Providing Transportation Services

The state is not the sole provider of transportation services in Washington. Many transportation services are provided by local governments, the private sector, and the federal government. Services are provided through local transit, county roads and city streets, private railroads, commercial and general aviation services, and marine shipping lines. The WTP recognizes and supports the important contributions of local governments, the private sector, and the federal government in providing these necessary transportation services.

While the WTP identifies a multimodal balance in transportation needs across the state, implementing this plan will largely be the responsibility of system owners. Table 2 describes the WSDOT role in implementing the WTP service objectives. These figures reflect WSDOT's historical role in owning and operating the state highway and ferry systems, with an increasing role in supporting public transportation, rail services, and multimodal advocacy.

The service objective needs, funding targets, and projected funding shares for public transportation and intercity passenger rail are identified in Table 1.

WSDOT's Share as a Percentage of Target Totals

The service objective costs for public transportation totals \$29,257 million and of this the state Transportation Commission set a funding target of \$25,948 million. The majority of the funding is to be met by federal and local funds at 90 percent of the constrained plan. The state share is set at ten percent of the public transportation target total.

The Transportation Commission set a higher state share for intercity passenger rail. The Commission's target is to fund WSDOT's needs for its service objectives — \$2,907 million at 43 percent of the total needs for intercity passenger rail. The majority of the non-state share — 57 percent of the target total — is to be funded by the private sector (railroads, Amtrak, ports, etc.).

Table 2 also summarizes available revenues and the amounts by which revenue must be increased to meet the WTP targets for public transportation and intercity passenger rail.

Realistic and Achievable Targets

The Commission's targets for the WTP (and for this plan) represent a realistic and achievable package of transportation services for the next 20 years. Like the last 20 years, achieving these targets requires regular increases in revenue sources. In total, state transportation programs will need an additional \$9.4 billion over the next 20 years (in addition to \$14.4 billion that will be available at current revenue rates) to meet the state action strategies laid out in the plan.

While meeting these needs is daunting, looking at the past maintains perspective. Over the last 20 years, transportation revenues have more than doubled as the state's population and economy grew. Keeping up with this historical growth rate will go a long way toward meeting our 21st Century transportation needs.

Plan Implementation

The state legislature will make the final decision on the appropriate levels to fund the modes and programs within the WTP through biennial state budgets and other revenue authorizations. The plan provides a longer term context with which those shorter term revenue decisions can be made.

Developing a Six-Year Implementation Plan

A Six-Year Implementation Plan for state actions is currently under development. This six-year plan will provide a multi-year framework for all state investment and advocacy actions proposed in future agency budget requests. This implementation plan will be developed throughout 1996 and will form the foundation of WSDOT's 1997 budget request.

Introduction

Public transportation finance, performance, and service information is regularly reported to federal, state, and local governments. The recipients of these reports need information for various reasons. Therefore, the type and format of information required vary from report to report. Current public transportation reporting requirements include, but are not limited to:

- *Federal Transit Administration (FTA) National Transportation Database*
- *Public Transportation Management System (PTMS)*
- *WSDOT Annual Public Transportation Systems Summary Report*
- *State Auditor's Office Transit Budget Accounting and Reporting System (BARS)*
- *Transit Development Plans*
- Local Transit Board Reports

For example, the Washington State Department of Transportation's (WSDOT) *Summary of Public Transportation Systems in Washington State*, which is required by RCW 35.58.2796, specifies that descriptions of individual public transportation systems shall include:

- Equipment and facilities, including vehicle replacement standards;
- Services and service standards;
- Revenues, expenses, and ending balances, by fund source;
- Policy issues and system improvement objectives; and
- Operating indicators applied to public transportation services, revenues, and expenses.

LTC Public Transportation Study Results

The *State of Washington LTC Public Transportation Study* resulted in several findings regarding public transportation reporting. These findings focused on issues such as the need to consolidate, streamline, and enhance current reports and reporting processes. A key recommendation of the study stated:

“Consolidate into a single, uniform account system, with common definitions and a format consistent with the BARS accounts, the financial reports submitted to FTA, WSDOT, and the State Auditor.”

State Auditor's Office (SAO)

In the late 1980s, the SAO expressed interest in updating Transit BARS. This project was delayed pending completion of the LTC Public Transportation Study, since the study included a review of transit reporting.

WSDOT Reporting

As a result, WSDOT is evaluating public transportation reporting. The primary objectives of this work will be to bring greater consistency, efficiency, and relevance to public transportation reporting, which will include linking public transportation reporting to the *Public Transportation and Intercity Rail Passenger Plan*. The WSDOT Public Transportation Office developed an initial draft work plan that includes the following steps:

- Define data needs — determine the data that will best meet the needs of the plan.
- Review other reports for transfer opportunities — determine what statistical analyses are used in National Transportation Database and SAO reports.
- Design new report — revise existing summary report so that it provides consistency in data requirements with other reports and reflects data needs of the plan.
- Develop new reporting process — simplify and expedite current reporting process.

Status of Work

Transit Budget Accounting and Reporting System (BARS)

The first task conducted as part of developing a new state report is an assessment of transit financial reporting. This has recently been accomplished by revising the Transit Budget Accounting and Reporting System (BARS) manual, which specifies the format for transit agencies to report financial information to the SAO.

In order to evaluate and revise Transit BARS manual, WSDOT assembled a working committee to assess financial reporting issues and needs. Participants on this committee included representatives from the Washington State Transit Association (WSTA), SAO, WSDOT Public Transportation Office, and paratransit providers. Subsequently, a revised transit chart of accounts has been developed.

The new Transit BARS manual will support the fundamental process for statewide planning and performance reporting. To be successful in the planning process, agencies must generally speak the same financial language. The new Transit BARS manual will report financial information using common standards for reporting. This will directly affect annual reports with performance measures and allow the state to gauge performance and determine progress toward meeting service objectives.

Transit Development Plans

Previously, transit agencies reported their transit development financial programs to WSDOT on an annual basis under RCW 35.58.2795. Recently, this legislation was revised so that more comprehensive transit development plans (TDPs) were required. In early 1996, the WSDOT Public Transportation Office worked with stakeholders to develop a new process, then held a series of regional workshops to provide guidance to the local agencies and a suggested format for preparing the TDPs.

The new TDPs due by 1996 to WSDOT are designed so that they meet several state reporting requirements. Information from these local plans will be utilized to prepare the *State Public Transportation Systems Summary Report*, the *Public Transportation and Intercity Rail Passenger Plan*, and *Washington's Transportation Plan*. Furthermore, as an appendix to the TDPs, the local transit agencies will submit their inventory forms for the Public Transportation Facilities and Equipment Management System (PTMS).

New Public Transportation Systems Summary Report

After the *Public Transportation and Intercity Rail Passenger Plan* has been completed, the WSDOT Public Transportation Office will begin development of the new format for the summary report of public transportation systems in Washington State. With the plan in place, the data needs that the report will support will have been determined.

Future Reporting

As mentioned previously, the primary objective of evaluating the state's Summary Report is to bring greater consistency, efficiency, and relevance to public transportation reporting. This encompasses simplifying and standardizing the reporting process and enhancing the usefulness of the information contained in the Summary Report by linking it to the *Public Transportation and Intercity Rail Passenger Plan*. Possible changes to the current Summary Report include:

- Adding a statewide performance assessment.
- Incorporating trend analysis.
- Addressing state goals and objectives for public transportation.
- Addressing coordination issues.
- Expanding the types of public transportation providers covered by the report.
- Looking at unique system characteristics.
- Revising performance measures.
- Adding level of service measures and standards.

Possible changes to the reporting process include:

- Automating the submittal of data by public transportation providers.
- Generating the new state report from the computer database.
- Reporting on a biennial basis.

Some of these changes may require legislative revisions. For example, changes to information required to be submitted by transit agencies or an expansion of the types of providers covered by the report, such as including non-transit agency paratransit providers, could require changes in legislation.

Statewide Public Transportation Computer Database

Service Inventory for Statewide Public Transportation Plan

Data collection was an essential first task in the development of the *Public Transportation and Intercity Rail Passenger Plan*. A service inventory form was created to collect data statewide to serve as a baseline for planning. Once a baseline of existing public transportation services and programs was known, then the information could be used in a variety of ways, such as measuring needs and deficiencies, performance, and trends and projections. WSDOT reviewed a variety of survey instruments, requested input from the PTAC as to content and format, determined what data was needed, and developed a survey form.

The service inventory was then distributed to over 220 agencies and organizations statewide, including: Metropolitan Planning Organizations (MPOs), Regional Transportation Planning Organizations (RTPOs), WSDOT regions, transportation providers and brokers, social service programs, and various state agencies. While the survey instrument asked for generic operational data, it also requested information on intermodal connections, coordination, unmet needs, eligibility standards, land use linkage, and future planning.

Survey forms were distributed in August 1993. The response rate was over 33 percent. As anticipated, the response rate was highest by public sector participants.

Computer Database for Public Transportation Statewide

Data collected from the Statewide Public Transportation Service Inventory was entered into the state public transportation computer database. FoxPro was utilized to create the program. The program provided the mechanism to establish a baseline of data, enable the tracking of trends, assist in determining deficiencies and in aggregating data by state, regions, and counties.

Public Transportation Profiles by County

Constructing a profile of existing public transportation services for each county in the state was a primary use of the survey data. The *Baseline Public Transportation County Profiles and Regional Maps* are provided in Appendix B. Profiles serve as a tool to understand what services are being offered, whether intermodal connections are occurring, current ridership levels, and financial considerations. The maps reflect public transportation services and programs at a county as well as regional level, thereby providing a broader view of intraregional mobility.

Demographics for the profiles are from the following Office of Financial Management reports: *1993 Population Trends for Washington State*, *Poverty in Washington State and its Counties: Results from the 1990 Census*; and the *1990 Federal Census Data for Washington State for Data on Disability Status*. Low income and mobility limited population statistics were projected for 1993 from the 1990 Federal Census data.

The Services/Programs and Reported Funding tables, presented in the profiles, display some gaps in data where information was not available. This also may indicate a need to take additional steps in data collection in the future, for example, subsequent data collection could include site visits, and for social service agencies, a survey instrument designed specifically for obtaining client trip information.

Public Transportation Facilities and Equipment Management System

Introduction

The Public Transportation Facilities and Equipment Management System (PTMS) is a tool for monitoring the condition of the capital assets of the public transportation service providers within Washington State. From that monitoring will come the development of strategies and projects which provide for optimizing the use of those assets. The PTMS, which initially was a requirement of the Intermodal Surface Transportation Efficiency Act (ISTEA), is also a key element of the *Public Transportation and Intercity Rail Passenger Plan* for Washington State. The PTMS will become an important source of information to the planning process.

It is anticipated that the primary users of the PTMS will be those decision makers who are directly involved with the individual public transportation service providers — the owners, managers, board members, and local elected officials who oversee the operation and control of the system assets. The PTMS will allow these people to have data which can indicate trends in the maintenance of their assets. The information can be used to modify maintenance programs and to predict upcoming major investment needs.

At the state level, it is anticipated that the information will be used in the state planning process to establish a long range, comprehensive view of major capital replacement projects and the potential for need of state financial assistance. This information can also be used to help prioritize grant applications for state funds to replace or rehabilitate capital assets. Local transportation authorities are already required to annually submit operating and financial statistics. That reporting process is the likely vehicle for communicating PTMS information.

PTMS Development Process

The process began with the publication, by FHWA and FTA, of draft rules for the PTMS. WSDOT coordinated with stakeholder groups in identifying issues and making recommendations within the review process. WSDOT also created an internal committee that included staff responsible for all the management systems required by ISTEA. This committee has served to set policy guidelines and coordinate the development of the individual management systems.

Once the regulations were in place, WSDOT staff worked with associations representing the major segments of the public transportation industry to create an advisory committee of experts from various segments of the industry. Maintenance managers, capital facilities managers, finance directors, and representatives from metropolitan planning organizations were among the members. Different sized transit systems and other modes, such as paratransit and ferries, were also involved. The intention was to involve as many people from as many perspectives as possible. Using this broad base of perspectives allowed for the development of an appropriate system that would minimize the burden of implementation.

The first task of the advisory committee was to review and approve a work plan as required by the regulations. The work plan laid out the schedule for accomplishing all the required elements of the PTMS and to meet the September 30, 1996 deadline for complete implementation. That work plan was submitted to the Federal Highways Administration in December 1994.

An early first step was to gather information about management systems. The services of the Multistate Transportation Assistance Program (MTAP) were utilized to survey other state DOTs on approaches to PTMS and particularly on the issue of assessment of condition. Eight states responded.

One response was most notable and became the basis of the PTMS system for Washington State. The state of Michigan was developing a PTMS which provided a ten-point scale for rating ten subsystems of vehicles. This score was then factored in with scores of actual miles versus design service miles and actual age versus design service age to create a vehicle health index. The ten-point scale concept was adopted by the committee as a method for identifying condition for vehicles. The idea of analyzing condition utilizing subsystems was also adopted for evaluating facilities. Utilizing the subsystem approach for analyzing equipment was found to be problematic; there was simply too great a diversity of equipment types. A simpler analysis process was adopted for equipment.

Washington State PTMS

What Agencies or Organizations Are Included?

The federal regulations required that all recipients and sub-recipients of Federal Transit Administration Section 5307, 5309, 5310, and 5311 funds shall be included. WSDOT had the authority to extend these reporting requirements to all transit systems created under state law whether such systems are federal fund recipients or not.

At the time the PTMS became voluntary, WSDOT reassessed its plan to require all federal grant recipients to report. The PTMS will initially be applied to those transit systems receiving FTA funds and the other local public transportation authorities operating in the state. Other public transportation providers intending to apply for funds from these accounts will be encouraged to participate in the PTMS as well. The long range plan is to involve all public transportation providers in the PTMS. This process will be phased in once the PTMS is established.

What Does the Inventory Include?

The federal regulations require that rolling stock, facilities, and equipment be monitored by the PTMS. States are given discretion in determining the exact definition of what will be included. The WSDOT PTMS will include all vehicles which are used in passenger service as the rolling stock definition. Facilities will mean all structures or improved sites which have a replacement value of \$25,000 or more. Equipment will be defined as any vehicle not regularly used for passenger service or devices used at a facility, but not permanently mounted in the facility, which have a replacement cost of \$100,000 or greater.

How Will the Information Be Reported?

Forms for reporting each of the categories of items to be included in the inventory have been prepared and are included as Appendix A. For the initial report, each reporting entity will complete the forms and submit them to WSDOT. Because they will be part of the State Reporting Program, they will be due on April 1 of each year. The initial inventory began in February 1996.

What Information Will Be Reported?

All categories of assets are required to report condition, age, remaining useful life, and replacement cost as a part of the federal regulations. For rolling stock the inventory will also include seating capacity and fuel type.

WSDOT has also created forms relevant to the rolling stock inventory which the reporting entities may desire to use in preparing the report submitted to the state. This form is included in Appendix A.

Summary of PTMS

Goal Accomplishment

The PTMS describes an asset management strategy that focuses on rolling stock, facilities, and equipment. It is designed to be easy to implement and to have minimum impact on individual systems. Thresholds have been set so as to provide useful information about assets of reasonable significance. For rolling stock, individual systems will report on fleet averages rather than individual vehicles. This is more significant for larger systems than smaller ones. The tool does permit exception reporting when individual units do not perform as well as the fleet average.

The PTMS will be incorporated into the already existing state reporting program. The data it provides will feed directly into the *Public Transportation and Intercity Rail Passenger Plan for Washington State*, and it will be used to assist in the distribution of state and federal grants.

Future Improvements

The initial PTMS will be applied to the recipients of federal grant programs in the state. As the PTMS process matures, efforts will be made to expand its application to other public transportation entities such as intercity bus and possibly passenger rail. As experience is gained, the tool will be modified to fit the evolving information needs of the state, regional, and local agencies. One future benefit that will be explored is the use of the model to track the performance of types of assets to evaluate their performances and provide information to agencies in the market for specific vehicles, facilities, and equipment. If certain types of assets are found to perform better than others, that information will be useful for future purchasing decisions.

Performance Measurement

Performance measurement was a topic of discussion in the *State Public Transportation Plan 1993 Interim Report to the Washington State Legislature*. Included as an appendix in that report were a series of research papers focused on measuring level of service and performance in public transportation systems. The result of that research is that WSDOT has now identified areas of performance that are in the state interest, namely, accessibility and level of service. The status of development of this statewide performance measurement follows in the next session.

Methodologies for Assessing Access and Level of Service

Introduction

The concept of Level of Service (LOS) has been central to transportation planning for many years. Unfortunately its application has generally been limited to the performance of automobile travel. There have been attempts to develop LOS tools for public transportation uses, but no single proposal has gained significant support.

The concept of level of service is used to evaluate the performance of a system. It can be measured by using one or more variables.

The passage of the Growth Management Act has placed greater emphasis on LOS by creating concurrency requirements on future development and growth. That future growth must be accommodated without a loss of LOS in the transportation system. Regional Transportation Planning Organizations are currently developing LOS tools for use in their regional transportation planning processes.

Conventional applications have been on local transportation corridors, and the traditional models have been used to measure the performance of roadways. Public transportation was often perceived merely as a tool to affect the LOS condition on the roadways. Interest was directed toward the movement of vehicles rather than people. The following is a representation of the traditional LOS tool used in evaluating roadway conditions. The variables used in this example are Traffic Volume to Capacity and Delay at Signals. They are used to measure the attainment of the goal of efficient movement of traffic.

Traditional Roadway LOS Tool			
LOS	Traffic Flow Character	Traffic Volume to Capacity	Delay at Signals (Seconds)
A	Free Flow (Low volumes and no delays.)	Less than 60%	0-5
B	Stable Flow (Speeds restricted by travel conditions, minor delays. Presence of other users in the traffic stream.)	60-70%	5-15
C	Stable Flow (Speeds and maneuverability closely controlled due to higher volumes.)	70-80%	15-25
D	Stable Flow (Speeds considerably affected by changes in operating conditions, minor delays. High density traffic restricts maneuverability.)	80-90%	25-40
E	Unstable Flow (Low speeds, considerable delay, volume at or near capacity. Freedom to maneuver is extremely difficult.)	90-100%	40-60
F	Forced Flow (Very low speeds, volumes exceed capacity, long delays, and queues with stop-and-go traffic.)	Greater than 100%	More than 60

Developing LOS for Public Transportation

Current transportation planning is now more concerned with the movement of people, and this has led to greater awareness of public transportation as a system. This increased awareness has naturally drawn attention to developing LOS mechanisms for public transportation. Examples of variables used to measure level of service for public transportation are geographic accessibility, frequency, and affordability. Which variables are chosen determines what LOS is measured. The formal goals of the service should determine what variables are used to measure the LOS, since the LOS serves to evaluate how well these goals have been achieved.

For instance, if the goal of a rural transportation project is to provide a minimum level of transportation to those who are not able to drive, the percentage of the population living within a certain distance of the bus route would be an appropriate LOS measurement standard. On the other hand, if the goal is to reduce single occupancy vehicles (SOVs), not geographic access but ridership might be a more appropriate LOS variable. Usually more than one variable needs to be used to measure LOS.

There is clear value in creating LOS tools for public transportation. These tools can help to define and refine state interest in public transportation. They will be useful in evaluating the performance of the public transportation system to aid in determining whether existing activities are actually contributing toward meeting goals and objectives. To that end, they could help identify potential state roles, particularly if certain state activities are found to have little or no impact on the positive development of the system. It would also be advantageous if a common set of tools could be developed that apply locally, regionally, and at the state level.

Adapting LOS to Diverse Situations

An interesting dilemma concerning a single LOS tool is the great diversity of modes and programs that comprise the public transportation system. The search for a common LOS standard is further frustrated by the apparent differences that exist between local, regional, and state interest. Public transportation programs are considered the operational responsibility of local governments and private sector entities. Finally, regional LOS concerns traditionally have been focused on corridors and region-specific issues, while the state interest in public transportation is focused more on access and mobility. Each different focus, or policy goal, will have a different way of defining LOS, and therefore a different measurement.

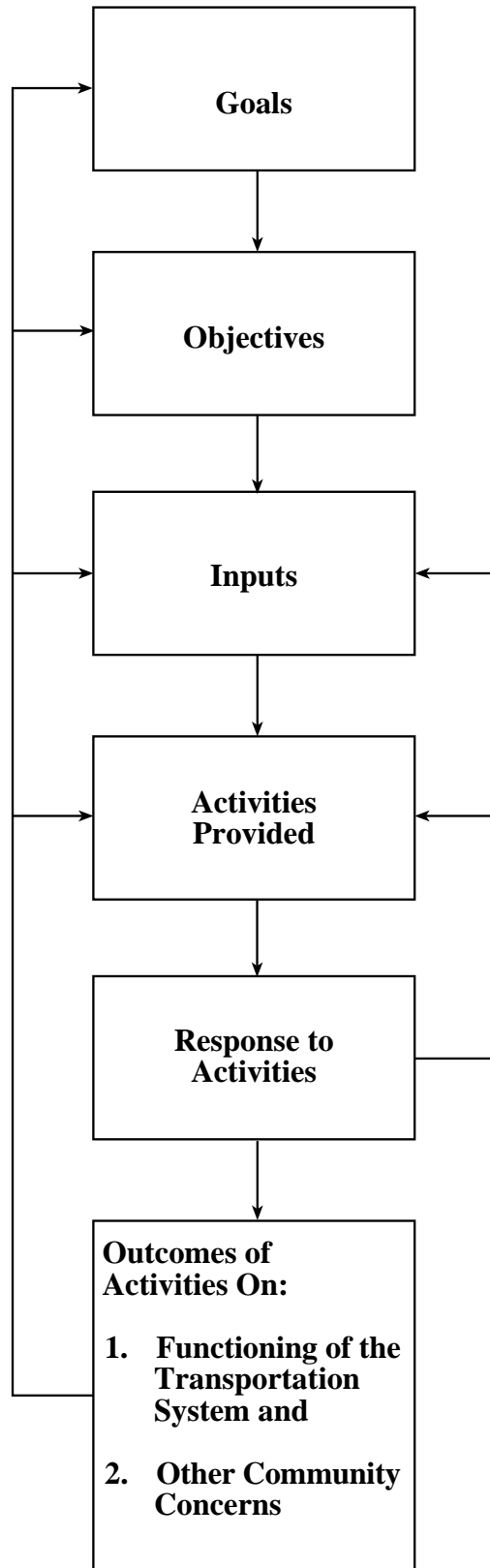
As a result of the increased interest in LOS, WSDOT sponsored a research effort that was undertaken by the University of Washington (UW). That research effort undertook a review of existing efforts to define LOS for public transportation, considered the possibility of a single LOS tool, identified a range of performance measures, and proposed a new framework for Washington State. Draft Working Paper 2.1 in Appendix A describes this research of the LOS concept and public transportation assessment.

Proposed Framework

The UW team broke the LOS process into components and found that different applications emphasized different component elements. Further, they found deficiencies in that key components were absent from traditional processes. They proposed a new conceptual framework as a basis for addressing LOS. That framework is presented in the figure on the following page.

Two key points need explanation. The first is that any LOS measurement should be driven by clearly defined goals and objectives. Simply having service hours or service miles is not a valid measure of service. The second is that any LOS measurement must be related to outcomes on the existing transportation system and the community being served.

A survey of conventional LOS applications found variations due to emphasis on different elements. For example, some focused on activities provided and some on responses to activities. The conclusion of the UW team was that these selected emphasis areas led to incomplete evaluations. At the local level, LOS standards are often defined too narrowly and used inconsistently. The authors call for greater state involvement to correct this through ongoing technical assistance in service evaluation and decision making at the local and regional level. The study also found that current LOS definitions in the case studies differ significantly from the intentions of the Growth Management Act. The study further revealed that the state's current interpretation of LOS as related to ISTEPA and Clean Air Act mandates was too narrow.



Proposed Framework

One additional conclusion of the UW team was that the concept of LOS had very specific meanings to people, and that for many the meaning was narrowly defined by the traditional roadway LOS tool. It was recommended that new terminology be introduced to enable the process to develop new approaches. To that end, the purpose of the research shifted from developing LOS tools to creating an Access Assessment Framework, as access is one of the state's primary goals for public transportation. This led to the development of a second research paper, described in the following section.

Access Assessment Framework

The UW team has developed a prototype Access Assessment Framework, which is presented in Appendix A: An Access Assessment Framework for Washington State. Several points are provided here. The *Washington State Transportation Policy Plan* defined the key goal for the public transportation system. That goal is to “provide personal mobility choices for urban, rural, and intercity travel that are safe, reliable, affordable, and convenient.” From this were pulled four desirable outcomes that were to be measured with the Access Assessment Framework. These include choice, availability, intercity connections, and affordability.

Choice simply means having accessible alternatives to the single occupant automobile. Availability means that the alternatives are available at times when they are needed. Intercity connections means that communities are connected by alternatives, and that people within those communities can access those connections. Affordability recognizes the different abilities of people to pay for services, and is intended to reduce cost as a barrier.

Another goal of this effort was to design a model that can utilize readily available data. It is not the intention of WSDOT to create burdensome data collection requirements that might negatively impact local communities and service providers. The proposed model seems to meet that criteria, and it suggests an opportunity for the creative use of existing computer technologies. A full description of the prototype model can be found in Appendix A.

Summary

The proposed model is only a prototype, appropriate criteria and standards need to be addressed, and further testing and refinements will be done. Testing the validity of the model will be initiated in the near future. The goal will be to integrate the data requirements with existing reporting requirements and the regional and statewide planning processes.

A quote from the UW research team seems apropos to this discussion. “If we start with the assumption that it is fundamentally the role of state government related to transportation policy to protect the “mobility” or “accessibility” rights of individuals and to ensure the productive expenditure of transportation tax dollars, then it seems clear that there is a state interest at WSDOT to adopt a broader interpretation of LOS than currently is applied or understood in the transportation community.”

ADA: The **Americans with Disabilities Act of 1990** mandates changes in building codes, transportation services and facilities, and hiring practices to prevent discrimination against persons with disabilities.

Articulated Bus: High-capacity bus with two rigid sections connected by a flexible, bending middle section.

CAAA: The **Clean Air Act Amendments of 1990** identify “mobile sources” (vehicles) as primary sources of pollution and call for stringent new requirements in metropolitan areas and states where attainment of National Ambient Air Quality Standards (NAAQS) is or could be a problem.

Cities and Towns Operated Transit Authorities: Cities and towns may operate public transportation systems within corporate limits and may extend this service up to 15 miles beyond these limits, provided no certified common carrier operates in the area to which service is extended. Four of the state’s 24 public transit operators are organized under this authority: Everett, Prosser, Pullman, and Yakima.

Commuter Rail: Operates between a central city and its suburbs, and runs on a railroad right of way. Examples of commuter rail systems include Metrolink in Los Angeles, California, and British Columbia’s West Coast Express.

CMAQ: The **Congestion Mitigation and Air Quality Improvement Program** is a categorical funding program contained in Title I of ISTEA that provides funds for projects and activities to reduce congestion and improve air quality. To be eligible for CMAQ, projects and activities must contribute to achieving National Ambient Air Quality Standards and must be included in a Transportation Improvement Program (TIP).

County (Unincorporated Areas Only) Transportation Authorities: The county board of commissioners may operate public transit systems only in the unincorporated areas of a county. There are no public transportation operations functioning under this authority at this time.

CTAs: County Transportation Authorities are separate legal entities for which enabling legislation was enacted in 1974; they must be countywide. A CTA is established by resolution of the county board of commissioners and the governing body is comprised of three county commissioners and three mayors. Public transportation and ambulance service are the only functions which may be undertaken by a CTA. A CTA must adopt a public transportation plan. The Grays Harbor Transportation Authority, organized in 1974 as a CTA, is presently the only CTA in the state.

CTR: The **Commuter Trip Reduction** legislation requires major employers in the nine most populous counties in the state to take measures to reduce the number of single-occupant vehicle (SOV) trips and the number of vehicle miles traveled (VMT) by their employees. SOV trips and VMT are targeted to be reduced from a baseline year within homogeneous trip-reduction zones by 15 percent in 1995, 25 percent in 1997, and 35 percent in 1999.

Demand-Response Service: Transportation operation designed to carry passengers from their origins to specific destinations (generally curb-to-curb or door-to-door) on an immediate demand or advance (e.g., 24-hour) reservation basis.

Express Service: Higher speed transportation operation designed to make a limited number of stops along a given route and generally provided during peak hours by express buses.

Feeder Service: Local neighborhood circulator transportation service which provides a high level of access and connections with major transportation service corridors.

FHWA: The **Federal Highway Administration** is the agency of U.S. DOT with jurisdiction over highways.

Fixed-Route Service: Transportation service operated over a set route or network of routes generally on a regular schedule.

Fleet: All vehicles belonging to a transit system. There are many subsets of a fleet; revenue or passenger service fleet, maintenance fleet, or non-revenue fleet.

FTA: The **Federal Transit Administration** is the agency of U.S. DOT with jurisdiction over transit. Formerly known as the Urban Mass Transit Administration.

General Aviation: That portion of civil aviation that encompasses all facets of aviation except air carriers.

GMA: The **Growth Management Act of 1990**, amended in 1991, addresses the negative consequences of unprecedented population growth and suburban sprawl in Washington. The GMA requires all cities and counties in the state to do some planning and has more extensive requirements for the largest and fastest growing counties and cities in the state. Its requirements include guaranteeing the consistency of transportation and capital facilities plans with land use plans.

HCT: A **High Capacity Transportation** system is a public transportation system, such as commuter rail, that can accommodate large volumes of riders.

HOV: A **High Occupancy Vehicle** is a car carrying enough people to be able to travel in the HOV or Diamond Lane, or a vanpool or a bus. In Washington, most HOV lanes require that two or more persons travel together, although in some places three people are needed.

ITS: **Intelligent Transportation System** generally refers to the advanced technology applications that automate highway and vehicle systems to enable the more efficient and safer use of existing highways and transportation services.

Intercity Rail: Connects central city to central city on a railroad right of way in densely traveled corridors. Amtrak’s Metroliner service between Washington, D.C., and Boston is a well-known example of higher-speed intercity rail. Amtrak’s *Mount Adams* train from Seattle to Portland is an example of intercity rail.

Intermodalism: Is an operationally based concept which means the ability to make convenient connections between transportation modes for people and goods.

ISTEA: The **Intermodal Surface Transportation Efficiency Act of 1991** implemented broad changes in the way transportation decisions are made by emphasizing diversity and balance of modes and preservation of existing systems over construction of new facilities, especially roads, and by proposing a series of social, environmental, and energy factors that must be considered in transportation planning, programming, and project selection.

Light Rail: Carries a light volume of traffic. “Light” refers to ridership capacity not to weight. Light rail may share right of way on a roadway or operate on exclusive right of way and can have multi-car trains or single cars. Trolley cars and Portland, Oregon’s, MAX system are examples of light rail.

Metropolitan Municipal Corporations: Metros are separate legal entities which are governed by an extensive set of state laws outlining the establishment and performance of metro functions, one of which may be a transit authority. The proposed metro area may be greater or less than countywide, except in King, Snohomish, and Pierce counties, and must be either a first class or optional municipal code city. The establishment of a metro is subject to a majority voter’s approval. King County Department of Metropolitan Services is the only operating metro thus far in existence.

Mode: A form of transport. For example, buses and trains are both transportation modes.

Mode Split: The proportion of total person trips made with various kinds of modes of transportation (e.g., 50 percent auto driver, 10 percent auto passenger, 25 percent subway, and 15 percent bus).

Monorail: A railway system using one rail on which a vehicle or train of cars travels.

MPO: A **Metropolitan Planning Organization** is the agency designated by the Governor (or governors in multi-state areas) to administer the federally required transportation planning process in a metropolitan area. An MPO must be in place in every urbanized area over 50,000 population. The MPO is responsible for the 20-year long-range plan and the Transportation Improvement Program. The official name for an MPO may also be Council of Governments, Planning Association, Planning Authority, Regional or Area Planning Council, or Regional or Area Planning Commission. ISTEA provides procedures under which local governments and governor(s) may designate an MPO.

Multimodalism: The availability of transportation mode choices for people and goods. The concept, multimodalism, is system oriented and describes a total transportation network.

Passenger Trip: One person making a one-way trip origin to destination. One round trip equals two passenger trips.

PTBA: Public Transportation Benefit Area: The authority under which most of the local transit agencies in Washington State are organized (RCW 36.57A.010-160). PTBAs are separate legal entities which may be less than countywide or in multiple counties. The process to establish a PTBA includes convening a public transportation conference, selecting the governing body, defining the formal boundary area, and holding an election. A majority of voters must pass the measure for the taxing authority to take effect. The local sales tax generated, up to six tenths of one percent are then matched by motor vehicle excise taxes. PTBA's have been formed in Clallam, Clark, Cowlitz, Island, Jefferson, Kitsap, Lewis, Mason, Pacific, Pierce, Skagit, Snohomish, Spokane, Thurston, Walla Walla, and Whatcom counties; bi-county PTBAs operate in Benton/Franklin and Chelan/Douglas counties.

Ridership: The number of persons using a transit system to make a one-way trip (expressed as hourly, daily, monthly, or yearly ridership, see Passenger Trip).

Ridesharing: Any of several transportation means, other than mass public transit, used by more than one person to make a trip (e.g., carpool, vanpool, and shared-ride taxi).

RTP: A Regional Transportation Plan, coordinating transportation planning efforts of all member jurisdictions, is required by all Regional Transportation Planning Organizations receiving funding for regional planning under the Regional Transportation Plan Program of the GMA.

RTPO: Regional Transportation Planning Organizations were authorized by the legislature in 1990 as part of the Growth Management Act. They are voluntarily created by local governments to coordinate transportation planning among jurisdictions and to develop a regional transportation plan. Washington provides funding and a formal mechanism that is available to all local governments (and not only those required to plan under GMA) and the state to coordinate transportation planning for regional transportation facilities.

Rural Area: Designed by the FTA as an area, village, town, or community that is not a part of a designated urban area. An area that has a population of less than 50,000.

Schedule: A listing of every trip provided on a transit route during the hours of service, including specific stopping points or major loading areas.

Service Miles: Sum of the number of miles transit vehicles were driven in passenger service for the year, exclusive of deadhead miles. Also referred to as Annual Vehicle Revenue Miles.

SOV: Single-Occupancy Vehicle is one that is carrying only one person.

STP: The Surface Transportation Program is one of the key capital programs in Title I of ISTEA. It provides flexibility in expenditure of "road" funds for nonmotorized and transit modes and for category of activities known as transportation enhancements, a broadening of the definition of eligible transportation activities to include pedestrian and bicycle facilities, and enhancement of community and environmental quality through ten categories of activities.

TDM: Transportation Demand Management refers to the policies, programs, and actions implemented to increase the use of High Occupancy Vehicles (public transit, carpooling, and vanpooling) and nonmotorized transportation, and/or spread the timing of travel to less congested time periods through alternate work hour programs.

TDP: The Transit Development Plan is a six-year plan that outlines the intended timetable for public transportation services, including a detailed program of revenues and expenditures for capital equipment acquisition, system management, and operations.

Telecommuting: The substitution of electronic or telephone systems for traditional forms of transportation. A person that uses a personal computer at their home or at a neighborhood work station, that is linked by a modem or facsimile machine to their work place or coworkers, is telecommuting when they can substitute a journey to work electronically. This can also apply to other travel substitutions, for example teleconference, telemedicine, etc.

TIP: A Transportation Improvement Program is a three-year transportation investment strategy required from metropolitan planning organizations under the Intermodal Surface Transportation Efficiency Act that addresses the goals of long-range transportation plans and lists regional transportation priority projects and activities.

TMA: Transportation Management Areas are designated under the Intermodal Surface Transportation Efficiency Act as any urban area over 200,000 population. This subjects it to additional planning requirements but also entitles it to funds earmarked for large urbanized areas.

Transfer: An instrument (paper, ticket, or token) issued to a passenger that allows changing from one transit vehicle to another, according to certain rules. Moving between vehicles to complete a trip.

Transportation Brokerage: Coordination of transportation services in a defined area. The transportation broker often centralizes vehicle dispatch, record keeping, vehicle maintenance, etc., under contractual arrangement with agencies, municipalities, and other organizations. It is possible to serve both social service agency and general public transportation needs under the same management/operation by using the transportation broker concept.

Transportation Disadvantaged: A person who does not have immediate access to a private vehicle or, because of age or health reasons, cannot drive and must rely on others for transportation.

TSM: Transportation System Management improves the flow of traffic through traffic signal synchronization, freeway on-ramp signals, the construction of high-occupancy-vehicle (HOV) lanes, left-turn restrictions, and other measures.

Urbanized Area: Designated by the FTA as an area having a central city and surrounding closely settled territory of 50,000 population or more, according to the most recent census.

Vanpool: A prearranged ridesharing service in which a number of people (7 to 15) travel together on a regular basis in a van, particularly to and from work.

Glossary

VMT: Vehicle Miles Traveled is a measure of transportation system use reflecting the number of miles traveled during a trip, multiplied by the total number of trips made.

Appendix A

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Current and Potential Revenue Sources

Current and Potential Revenue Sources for Public Transportation

Transit revenues come from the motor vehicle excise tax (MVET), sales tax, business and occupation tax, household tax, fares, other internal income (e.g., interest), other state income, borrowing, and federal grants. Paratransit revenues come from federal, state, and local sources. These sources include federal and state grants, state general fund (e.g., DSHS), transit revenues budgeted for paratransit operations, fares, and local and private funding.

General public transportation revenue sources are described in more detail below.

Sales/Use Tax

The sales/use tax is authorized by RCW 82.14.045. The tax applies to all taxable retail sales within a transit district's boundaries. It is an add-on tax to the state's retail sales/use tax with the tax applying to the same transactions as the state's tax. The tax applies to most retail sales of tangible personal property (sales of motor vehicle fuel and food for off-the-premises consumption are two major exceptions). The tax also applies to the charges for selected personal services, including the repair, cleaning, altering, installing, etc., of real and personal property, motel/hotel rentals, various amusement charges, and others. The use tax also applies to articles purchased in other states but used in Washington. Any transit agency that imposes a local sales tax is prohibited from imposing a local household tax or local business and occupation (B&O) tax.

Local Business and Occupation Tax

City and unincorporated transit agencies are authorized to impose B&O taxes by RCW 35.95, except if they already impose a sales tax for transit. The tax applies to the value of products, gross proceeds, or gross income of all taxable business establishments within the boundaries of the transit agency.

Household Tax

Transit agencies are also authorized to impose household taxes by RCW 35.95, except when they already levy a sales tax for transit. The tax applies to each housing unit within the transit boundaries where one or more persons live as a family unit. The tax is not to exceed \$1 per household per month.

Motor Vehicle Excise Tax (MVET)

The authority for local agencies to impose and receive MVET revenues is found in RCW 35.58.273 and RCW 82.44.150. Most local government transit agencies are permitted to impose this tax, but in order to qualify for revenues they must match the MVET revenues with other tax revenues collected at the local level. Local matching tax sources available to transit districts include sales/use, B&O, and household tax. Some systems are not currently eligible to match revenues, including cities of Yakima and Everett.

All registered motor vehicles are subject to the state MVET under RCW 82.44.20. When a public transit agency is established it has the authority to impose a local MVET. Then the MVET is distributed to local transit agencies based on the vehicles registered to that district. As a result a local MVET reduces the state MVET revenues rather than increasing the amount of tax paid by the taxpayer. Though sometimes described as a state tax source, in 1976 the Washington State Supreme Court confirmed the MVET as a local tax.

Fares

This includes general patronage fares, discount fares, passes, peak-hour surcharges, and other fees levied directly upon the individual passenger taking the trip, at the discretion of the local operating authority (board).

Other Internal Income

Other types of income include:

1. *Charter Services* — Trip-specific transit services to groups. Generally not allowed with equipment purchased with federal money.
2. *Non-fare Enterprise Revenues* — Include advertising in transit properties, leasing of air rights, and similar activities. Increased advertising revenues have been targeted for special treatment by recent federal legislation, and may now be bondable if properly dedicated.
3. *Specific Service Contracts* — Contracts to provide targeted transit support to special constituencies such as school children and health and welfare clients.
4. *Interest* — Interest generated from interest-bearing accounts and investments.

Borrowing

There are many ways to create revenue sources through debt financing and revenue enhancement. Key among these are:

1. *Bonds* — Appropriate for high front-end capital expenses where a tax or fee can be pledged for debt service. This is a good source for obtaining large amounts of revenue quickly, although local government authority is usually regulated by the state. Federal tax statutes, local government bond ratings, type of bond (general obligation or revenue), statutory soundness, kind of revenue source, and interest rates often have a bearing on the feasibility and attractiveness of this option.
2. *Participation Trust Certificates* — Used to provide evidence of ownership to an investor who leases property to the agency. Secured by assets and cash reserve funds. Interest paid to investors is tax-exempt and risk is low.
3. *Zero Coupon Bonds* — Issued by public agencies at a price below face value and at a deferred, unspecified interest rate. Discounting maturity value provides competitive, tax-exempt yields.

Federal ISTEA Programs

Large changes in federal funding of streets and highways are occurring through ISTEA. Under ISTEA, funds are provided for major program components that replace the federal aid for interstate, primary, secondary, and urban system categories as well as expand program funding to other areas.

1. *National Highway System (NHS)* — The NHS is a new program under ISTEA. The NHS will ultimately consist of about 155,000 miles of interstate and other major roads in the United States. NHS funding is available for a wide array of highway and/or transit projects in defined NHS corridors. Projects must be built to at least the federally defined 3R standards (resurfacing, rehabilitation, and restoration), including additional HOV lanes. Also eligible are operational improvements, ridesharing programs, surveillance, control and driver information systems, park and ride lots, and most transportation demand management projects.
2. *Surface Transportation Program (STP)* — The STP replaces the old federal aid primary, secondary, and urban system programs with a multimodal approach. Funds under this program may be directed toward transit capital, traffic management, HOV lanes, transportation control measures for air quality, safety projects, and bicycle and pedestrian projects, as well as road and bridge projects.

STP and the related equity adjustment funds are allocated to states on a formula basis. They are subject to certain distributions for safety projects, transportation enhancement projects, and population-based allocations to urbanized areas over 200,000 and under 200,000 population. Rural areas under 5,000 population receive a guaranteed portion of funds allocated to areas under 200,000 population. A portion of a state's apportionment may be used anywhere in the state for eligible projects.

In addition to the federally prescribed allocations of STP funds, the state has implemented a distribution plan for STP funds which addresses both the multimodal needs of the state and the need for competitive processes to determine the best use of available STP transportation funds. The STP distribution formula allocates funds to the following categories: safety, transportation enhancements, Transportation Management Areas (TMAs), Metropolitan Planning Organizations (MPOs), counties and Regional Transportation Planning Organizations (RTPOs), county and RTPO transportation planning, and a statewide competitive portion.

3. *Congestion Mitigation and Air Quality Improvement Program (CMAQ)* — The CMAQ, established under ISTEA, directs funds toward transportation projects in Clean Air Act nonattainment areas for ozone and/or carbon monoxide. These projects must contribute to the attainment of national ambient area air quality standards. In Washington State, the Seattle-Tacoma-Everett, Spokane, and Vancouver areas will receive CMAQ funds. Over the life of ISTEA, approximately \$92 million in CMAQ funds will become available to Washington State. Of this amount, only \$2 million will be available to WSDOT. These funds — 2.2 percent of total CMAQ funds statewide — will be allocated by a competitive process for projects which will benefit all nonattainment areas.

Federal Transit Administration Grants

Federal grant programs primarily come from seven sources including Federal Transit Administration (FTA) Sections 5303, 5307, 5309, 5310, 5311, and 5313(b) revenues. A description of these programs follows.

1. *FTA Section 5303 Planning and Technical Studies* — These are grants that go to transit authorities for special service or planning studies. WSDOT receives the federal funding which is granted to Municipal Planning Organizations (MPO) to carry out on an area's comprehensive planning program.
2. *The FTA Section 5309 Capital Grants Program* — Consists of three separate parts which include formula apportionments for fixed guideway modernization, discretionary grants for the construction of new fixed guideway systems and extensions to existing systems, and discretionary grants for buses. Under the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, formula apportionments for fixed guideway modernization and discretionary allocations for the construction of new fixed guideway systems and extensions to existing systems are each allocated 40 percent of available Section 5309 funds. Discretionary allocations for the replacement, rehabilitation, and purchase of buses and related equipment are allocated 20 percent. At least 5.5 percent of the bus funds must be made available to non-urbanized areas. The federal share of any project financed under Section 5309 is 80 percent of the "net project cost." "Net project cost" is defined as the portion of the cost of a project which cannot reasonably be financed from revenues.
3. *FTA Section 5307* — This is a formula grant program available only in urbanized areas for public transportation. Individual apportionments are set by formula; However, for urbanized areas of 50,000 to 200,000 population (1990 federal census) WSDOT and the affected systems cooperatively select the projects to be supported by these grants. Funds can be used for operating and capital expenses. An "operating limitation" is placed on Section 5307 funds. The operating limitation represents the maximum amount of the total apportionment that can be spent on operating expenses as opposed to, say, capital expenses. The match for non-operating expenses is 80 percent federal and 20 percent local. For operating expenses, the match is 50 percent federal and 50 percent local.

4. *FTA Section 5310* — Is a capital grant program that is available to nonprofit companies providing transportation services to the elderly and to persons with disabilities. Public entities are eligible only if there are no nonprofit companies available to operate specialized services in their area.
5. *FTA Section 5311* — Includes the following categories: (1) Capital and/or Operations Assistance; (2) Planning Assistance; (3) Intercity Bus Program; and (4) Rural Transit Assistance Program. Eligible applicants for FTA Section 5311 grants, which are administered by WSDOT, include public entities, private for profit organizations who provide transportation services (capital and/or operations assistance only), Indian tribal governments, and private nonprofit agencies.
6. *FTA Section 5313(b)* — Consists of transit planning and research funds which are available to support national and state level research, metropolitan and statewide transit planning, training, and demonstration projects.

WSDOT Programs

1. *High Capacity Transportation (HCT) Program* — Funding for HCT projects is provided by a percentage of the state's MVET that would have gone to the transit agencies within the following counties: Thurston, Kitsap, Spokane, Clark, King, Pierce, and Snohomish. Puget Sound applications are eligible only through the Regional Transit Authority (RTA) which includes parts of King, Pierce, and Snohomish Counties. Other eligible applicants are in Clark, Spokane, and Thurston Counties.

This state program is used for three purposes:

- Regional HCT system planning, including freight rail
 - Up to 80 percent matching assistance for local HCT planning
 - Interim support of the RTA established in the Puget Sound region
2. *Rural Mobility Grant Program* — The Washington State legislature appropriated \$1.5 million for “rural mobility” in the 1993-1995 Transportation Budget Act. In 1993, Secretary Morrison appointed a nine-member Rural Mobility Committee to:
 - Establish the policies and criteria governing the expenditure of these funds
 - Review all applications
 - Select projects

The Rural Mobility Committee developed the following criteria for the use and distribution of the funds:

- Planning, operating, and/or capital activities that serve rural residents
- Providing rural residents access to basic services (medical, educational, employment, recreational)
- Demonstrating benefit to rural communities
- Forming partnerships

3. *Transportation Fund* — The largest of the new state funds, the Transportation Fund is available for any transportation purpose (including highways). Monies in the Transportation Fund are appropriated by the legislature as part of the biennial transportation budget process. The funding sources are a 0.2 percent MVET surcharge, transit undefined MVET funds, and an additional 0.1 percent MVET transfer from the general fund. For the next two biennia, monies in the Transportation Fund have largely been promised by legislative agreements to meet projected shortfalls in the Department of Transportation's Category C program to expand capacity on state highways. However, changes in the project list may result from new city, county, or state priorities developed through newly mandated growth management and planning priorities.

Power Washington

A limited amount of oil rebate money is available for HOV projects and programs including projects synchronizing state and local traffic signals, construction of park and ride lots, and vanpool programs. These funds are administered through the State Power Washington Committee. Proposed projects must meet criteria determined by the court settlement and are subject to state and U.S. Department of Energy approval.

Transportation Improvement Board (TIB)

Funding is available to cities and counties as lead agencies for HOV project design and construction. Transportation Improvement Account (TIA) projects are awarded by the TIB based on a scoring system which gives points for the following: multi-agency coordination on a project; transit; HOV, or High Capacity Transportation (HCT) integration; projects proposed in high congestion areas; developer financial commitment; and a match ratio by TIB of less than 80 percent.

1. *Public Transportation System Account (PTSA)* — The PTSA was originally established by the state's Transportation Funding Act of 1990. The account was further defined, eligible programs and projects were amended, and a distribution methodology was outlined in RCW 82.44.150. This account is only open to those agencies that contribute to the fund. The process for the selection is competitive and evaluation criteria are used by the committee to select grant applications.

Monies deposited into the PTSA are allocated to public transportation projects submitted by the public transportation system from which the funds are derived, solely for: (1) planning; (2) development of capital projects; (3) development of high capacity transportation systems as defined in RCW 81.104.015; (4) development of HOV lanes and related facilities as defined in RCW 81.100.020; (5) other public transportation system-related roadway projects on state highways, county roads, or city streets; and (6) public transportation system contributions required to fund projects under federal programs and those approved by the Transportation

Improvement Board. For the 1993-1995 biennium year 1995, Jefferson Transit, LINK in Chelan/Douglas County, Whatcom Transportation Authority, Skagit Transit, and Spokane Transit were eligible to apply.

2. *Central Puget Sound Public Transportation Account (CPSPTA)* — CPSPTA was originally established by the Transportation Funding Act of 1990. The account was further defined, eligible programs and projects were amended, and a distribution methodology was outlined in RCW 82.44.150. Eligibility is the same as described under PTSA (1-4 and 6). This account is open to Puget Sound public transportation agencies, including cities and counties (King, Pierce, Kitsap, and Snohomish Counties).

Other State

State funding may include reallocating transportation funds through a multimodal emphasis.

Other states utilize sources that have been considered in Washington but not implemented, include:

1. *Refinery Tax* — Taxing oil at the refinery level instead of at the consumer level will access additional non-gas tax revenues.
2. *Sin Taxes* — Taxes on beer, cigarettes, and the like. Alabama earmarks some of its beer tax for transit. New Jersey dedicates some casino gambling tax revenues for transit purposes. Oregon has a cigarette tax for paratransit services.
3. *Lottery* — Authorized by 29 states plus the District of Columbia, although not all are operative as yet. Pennsylvania, as an example, earmarks some of this money for public transit.

County Sources

Local governments now have a menu of new local option taxes available for funding transportation improvements. Counties, which are responsible for urban and rural county roads, have three relatively new revenue options which may be used for public transportation purposes, two of which require voter approval and one of which may be authorized by the County Council or Board of Commissioners.

Counties choosing to impose local option taxes are required to coordinate programming with WSDOT, transit agencies, and cities. Some of the options (e.g., the commercial parking tax and the employer tax) are available to more than one jurisdiction. In such a case, counties, cities, and transit agencies must not only coordinate programming, but must also agree on which jurisdiction shall impose the tax. This kind of joint planning effort is complex and requires a high degree of regional coordination.

1. *Vehicle Registration Fee* — Counties may impose up to a \$15 annual vehicle registration fee on all vehicles registered in the county except trucks over 6,000 pounds. The revenue may be used for general transportation purposes, including highways, public transportation, high capacity transportation, planning and design, and other activities. As of September 1996, only King, Pierce, and Snohomish Counties have implemented this option.
2. *MVET Surcharge* — A county-level MVET surcharge of 15 percent may be authorized with voter approval in King, Pierce, and Snohomish Counties. Its revenues may be used for HOV lanes and related facilities, park and ride lots, and for other HOV programs. Up to 10 percent of the funds may be used by transit agencies for vanpooling, enforcement of HOV lane restrictions, and for programs which promote HOV use. The funds may also be used for preparing, adopting, and enforcing employer trip reduction programs.
3. *Employer Tax* — A county-level employer tax of up to \$2 per employee per month may be imposed with voter approval in King, Pierce, and Snohomish Counties. Like the 15 percent MVET surcharge, its revenues may be used for the full range of HOV facilities and programs. Employers who already participate in rideshare or other trip reduction programs must receive a credit against the tax. If both the employer tax and the MVET surcharge are imposed, the total revenue may not exceed the amount that would be generated by the MVET surcharge alone.

To date, the local option MVET surcharge and the employer tax have not been implemented by any of the three counties authorized to impose them.

Local and Other Sources

Cities also have new local option transportation sources that they may impose. One of those, the employer tax, is available only to operate a street utility and is thus not useful for public transportation purposes. Another option, the commercial parking tax, is potentially useful although implementation of the tax is expected to be complex.

1. *Commercial Parking Tax* — Cities may impose a tax on commercial parking businesses in one of several ways. The tax may take the form of a tax on the parking operator. Proceeds may be used for roads and streets, public transportation, high capacity transportation, planning, design, and other activities. This tax can be useful as a revenue source but it may also serve as a mechanism in a larger demand management strategy to encourage the use of public transportation. Issues involving the implementation of this tax are currently being worked on in a number of jurisdictions. The parking tax has not yet been implemented in any city or county.

The Washington State Transportation Center (TRAC) has just completed a draft of its comprehensive analysis of commercial parking tax. It includes preliminary estimates of revenue that could potentially be generated in five cities (Bremerton, Bellevue, Seattle, Lynnwood, and Tacoma) by five alternative methods of taxation and at four different tax rates. The most conservative alternatives are projected to yield annual revenues ranging from \$10,000 in Bremerton to \$625,000 in Bellevue to \$1.2 million in Seattle.

2. *Transit Agency Funds* — Six transit agencies have new revenue options which are limited to planning, constructing, and operating high capacity transportation systems. Agencies authorized to impose HCT taxes are in King, Pierce, Snohomish, Thurston, Clark, and Spokane Counties. These new revenue measures require voter approval.
 - a. *Local Option MVET (0.8 Percent)* — Transit agencies may impose a 0.8 percent local option MVET within their districts. Unlike the MVET surcharge which counties may impose, transit agencies are authorized to levy this tax directly on the base value of motor vehicles, except large trucks.
 - b. *Sales Tax (1 Percent)* — Transit agencies may also impose up to a 1 percent tax on retail sales within their district. One tenth of a percent of this new taxing authority may be used by the counties for criminal justice facilities and, if so used, is lost to transit agencies.
 - c. *Employer Tax* — Transit agencies may levy a \$2 per employee per month tax on businesses. Employers already participating in trip reduction programs must receive a credit against the tax. Transit agencies must coordinate with cities and counties on the use of this revenue source which those other jurisdictions may also use.
3. *Tolls* — These are fees charged to users of a road or facility and are generally based on size, weight, number of axles, and distance traveled. Tolls can produce large amounts of revenue and can be used to subsidize transit in addition to supporting the actual facility being assessed.
4. *Tax Increment Financing* — These are earmarked revenues from taxes on personal and real property based on increases above a fixed base attributable to transportation improvement. They can be used to secure bonds.
5. *Special Assessments* — These are charges to the owners of a property that benefit from an improved transportation facility and can be based on frontage, area, value, or a combination of factors. They can be used to support bond issues, although special legislation is usually required.

6. *Impact Fees* — These are imposed on private developers to mitigate impacts of the development of local service and can be in the form of tax on square footage, sponsorship of a transportation program, or improvements to adjoining facilities. They can be used as a condition for obtaining site plan approvals or building permits.
7. *Service Charges* — These are charges on properties for direct access to a transportation facility. They may be assessed as a lump sum contribution to a capital item or an annual fee to cover operating costs.
8. *Developer Financing* — These are payments of capital transportation improvement costs by private developers in return for dedicated land or air rights, or construction of specific facilities or subsidized facilities. In transit, one example might be a private complex built in conjunction with a privately financed, publicly owned transit station, possibly with joint building utilities. They may be voluntary or required by law. Many result in reduction of public expenditures but care should be taken to give equitable opportunity to all responsible developers.
9. *Negotiated Investments* — These are contributions by private property owners or developers to the cost of public transportation improvements in return for changes in existing zoning and building regulations, improved accessibility and customer acceptance (i.e., security agreements), or other perceived benefits. These are similar to developer financing and may be the voluntary project of a downtown business organization or similar group.
10. *Private Donations* — These are land or capital contributions by business and private donations for improvements that have strong private interest. Donors benefit from tax deductions and access.
11. *Private Ownership* — These include sharing ownership cost between transportation agencies and private entrepreneurs, employee subsidies for transportation, or development of a private consortium with authority to finance, construct, and charge fees to provide transportation. They may include a variety of transit options addressing market niches not well suited to conventional public transit. Public policy can promote private taxis, commuter vans, charger commuter buses, and so on.

Current and Potential Revenues for Intercity Passenger Rail

The following excerpt from the Options Report summarizes the major sources of current and potential project funding,

U.S. Federal Sources

1. *ISTEA and Federal Transit Administration* — The federal ISTEA programs (NHS, STP, and CMAQ) that are available for funding public transportation are also available to passenger rail. Other federal sources of funding are the Federal Transit Administration grants for formula capital and operating (Section 5307) and capital (Section 5309). These revenue sources are described in more detail under the Current Revenue Sources for Public Transportation section.

2. *Swift Rail Development Act* — The Swift Rail Development Act of 1994 identifies the PNWRC as one of five high-speed passenger rail corridors in the United States. The act clearly places responsibility for corridor development on state and local interests and encourages the participation of private entities. The role of the federal government has been defined primarily as a facilitator for technology development and assistance in corridor planning. While the high speed corridor designation does not guarantee federal participation in system development, it may offer an opportunity for attracting federal capital funds, should they become available in future appropriations.
3. *Amtrak* — Amtrak has primarily invested its limited capital funding in the Northeast Corridor and California. However, unlike other modes of transportation, Amtrak has not had a dedicated source of capital funding and has relied on specific capital appropriations from Congress.

Proposed Senate legislation would transfer one-half cent per gallon tax from the transit account of the highway trust fund to a new intercity rail passenger account until the year 2000. (the transit account has a surplus that may not be appropriated; if the surplus dips too low the one-half cent would go back to transit.) Providing almost \$700 million in dedicated funds for updated equipment and infrastructure investments would lower Amtrak's operating costs and make it easier to recover costs through new revenue generation. Amtrak has stated that if it is to be subsidy free in seven years, it needs adequate capital funding for plant and equipment.

The House Committee on Transportation and Infrastructure passed the Amtrak Reform and Privatization Act of 1995. This legislation would eliminate burdensome rules governing route selection, overhaul labor protection rules, limit liability, establish contracting procedures and eliminate the government's ownership and control over the company's board of directors. It is estimated that operating costs could be reduced by as much as one-third. Operating assistance would be eliminated over the next seven years. If passed into law, the bill will provide significant new tools for Amtrak management to streamline operations, reducing operating costs by an estimated one-third and reducing the need for Federal operating assistance.

Canadian Federal Funding

The international character of the PNWRC, along with demonstrated tourism and economic benefits, creates a strong rationale for Canadian federal investment. The magnitude, timing, and mechanism for such investment remains to be explored.

State and Provincial Funding

The current federal funding environment in both the US and Canada will likely dictate that most of the funding for intercity rail will need to be raised at the state, provincial and possibly the local level. This will certainly be the case in the first phase of the program, as federal support for such programs is likely to be minimal for the foreseeable future.

Each of these jurisdictions has addressed, or is currently addressing a long list of unfunded and underfunded transportation programs. The development of an efficient and attractive intercity rail program has been identified as a worthy goal and funds have already been committed by each jurisdiction. However, without an infusion of new transportation revenues, the competition for funding will be extremely competitive. Ultimately it will be the respective legislative bodies that will decide how intercity rail fits within the overall transportation system and the priority that rail improvements should have in the allocation of funding.

1. *British Columbia* — Generally, transportation programs in British Columbia are funded from general purpose tax revenues. The provincial government has interests in a number of transportation areas including highways, bus and transit, ferries, and commuter rail. The participation of the province in funding an expansion of intercity rail service between Vancouver and Seattle will need to compete favorably with other worthwhile transportation investment opportunities. Given the international dimension of the project, the magnitude of investment needs and the potential economic benefits, the province could look to the development of a federal/provincial partnership as a mechanism to fund intercity rail in the PNWRC.
2. *Washington* — Washington State sources for additional revenue include the Transportation Fund and Transportation Improvement Board grants. Refer to descriptions in the Public Transportation revenue section.

Local Government Support

Generally the opportunities for cost sharing with local governments are somewhat limited. However, in the case where joint use of facilities is possible, opportunities may exist where costs can be shared with local jurisdictions. The best example of this scenario is the proposed commuter rail development plan in the Puget Sound region. Projects which will add to the rail capacity in King, Snohomish, and Pierce Counties will benefit both the intercity service and future commuter service and should be considered for joint local/state funding. However, the funding for commuter rail is contingent on a successful funding initiative for the Regional Transit Authority. After failing at the polls in March 1995, the RTA will make one more attempt to gain funding support in 1996.

Another potential opportunity to attract local funding may exist at station sites. Many of the communities along the corridor have been developing multimodal transportation centers which provide connections between the intercity rail system and other local and regional transportation systems. WSDOT has been an active participant in the planning and development of intermodal transportation facilities. This participation has been contingent on the demonstration of a strong local commitment to these projects, including local ownership and operation of the facilities. In those instances where intermodal facilities have been developed, there has been a great deal of local initiative to develop cost sharing. These initiatives have included financial participation from local governments, transit districts, and Ports.

Freight Interests

1. *Private Railroads* — The private railroads, in particular the Burlington Northern Santa Fe, have an interest in making substantial investments in the corridor to maintain their capacity and meet the demands of shippers for freight movement. While the improvements identified in the PNWRC Options Report assume that the freight conditions are maintained as they would be without intercity rail, based on current practices, there will continue to be opportunities for joint financing of improvements where both passenger and freight rail users would clearly benefit.

One of the principle assumptions in the development of the PNWRC has been the establishment of a public/private partnership with the private freight railroads. Improvements designed for the enhancement of rail passenger service are assumed to be the responsibility of rail passenger interests, while improvements designed to address freight needs would be the responsibility of freight interests. Where improvements may reasonably benefit both freight and passenger interests, a cost sharing mechanism would need to be negotiated to equitably divide financial responsibility according to relative benefit.

2. *Ports* — In addition to the private railroads, port districts have a significant interest in the reliability and capacity of the freight rail system; their competitiveness depends on being able to offer fast and convenient shipping. As such, ports could participate in projects with significant joint benefits. However, rail passenger interests must demonstrate the joint benefit and propose a joint funding program.

Public Transportation Facilities and Equipment Management System (PTMS)

The Public Transportation Management System instruction and inventory forms for Equipment, Facilities, and Rolling Stock are included in this section. They were created by the Washington State Department of Transportation (WSDOT) as part of the state responsibility under the federal Intermodal Surface Transportation Efficiency Act (ISTEA).

Washington State Department of Transportation

**Public Transportation Management System
Instructions for Equipment Forms**

Every piece of equipment which has a replacement value of \$100,000 or greater shall be reported on the enclosed forms. Equipment with a value less than \$100,000 may be reported at the discretion of the reporting agency. Equipment is considered to be anything which is not permanently installed or is an integral part of a facility, exclusive of rolling stock utilized in transporting the public. For the purposes of establishing a base year inventory, the information required will include: equipment code or type; condition; age; remaining useful life; replacement cost; and, any additional description or comments about the equipment which the reporting agency wishes to have noted. A more complete definition of these categories is provided below.

Equipment Inventory Form

- Equipment Code or Type A listing of examples of equipment types along with assigned code numbers is shown below.
- Condition An evaluation of the current working order of the described unit, including its repair and safety record, based upon the 100-point scale presented below.
- Age Years since the equipment was manufactured.
- Remaining Useful Life The estimated number of remaining years through which the equipment will be able to carry out its intended purpose without replacement.
- Replacement Cost The estimated purchase price of an in-kind replacement of the equipment at the end of the remaining useful life.

Equipment Codes

Code	Equipment Type
01	Line Equipment/Structures
02	Fare Collection Equipment (Stationary)
03	Surveillance/Security System
04	Automated Data Processing or Computer Hardware/Software Systems
05	Support Vehicles/Vessels
06	Work Trains
07	Train Control/Signal Systems
08	Radio System (Stationary)
09	Shop Equipment (Other than permanently installed; e.g., portable bus hoist)
10	Signage Systems
11	Navigation Devices (ex: dolphins & wingwalls)
12	Life Safety Equipment
13	Bicycle Locker/Racks (Stationary)
14	Accessibility Devices
15	Power Distribution Control and Monitoring System
16	Other (Be sure to include complete description)

Equipment Description Form — Item 1 from the Equipment Inventory Form should match with Item 1 on this form. Additional copies of the Equipment Description Form should be made and numbered to match all the items listed in the inventory.

Description A complete description identifying the type of equipment and its function(s).

Comments If there are any issues related to the equipment which are considered significant, they should be noted. Examples might be plans for rehabilitation, elimination, or anticipated replacement due to changes in technology or other requirements.

Note: Item #1 from the Equipment Inventory Form should correspond to Item #1 on the Equipment Description Form. Please make copies of either form and number all the items consecutively as needed to cover all inventoriable items.

Point Score Definitions for Equipment Condition Assessment

- 100 Requires only routine preventive maintenance.
- 80-90 In good working order, requiring only nominal or infrequent minor repairs.
- 50-70 Requires frequent minor repairs or infrequent major repairs (more than six months between repairs).
- 20-40 Requires frequent major repairs (less than six months between repairs).
- 10 In sufficiently poor condition that continued use presents potential hazard.

Washington State Department of Transportation		Public Transportation Management System Equipment Inventory		
Equipment Code	Condition (points)	Age (years)	Remaining Useful Life (years)	Replacement Cost (\$)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				

Equipment Description
1. Description: Comments:
2. Description: Comments:
3. Description: Comments:
4. Description: Comments:
5. Description: Comments:

Washington State Department of Transportation

**Public Transportation Management System
Instructions for Facilities Forms**

Every facility which has a replacement value of \$25,000 or greater shall be reported on the enclosed forms. Facilities of a lesser value may be reported at the agency's discretion. For the purposes of establishing a base year inventory, the information required will include: facility name (or address); condition; age; remaining useful life; replacement cost; facility code; detailed facility description; and, any comments about the facility which the reporting agency wishes to have noted. A more complete definition of these categories is provided below.

Facility Inventory Form

- Facility Name
What is the name by which the facility is most commonly referred — e.g., Battleground Park and Ride, North Base, Edmonds Ferry Terminal.
- Condition
A list of potential facility subsystems is provided below. Each of the subsystems existing within a facility should be evaluated based on the 10-point scale provided. The facility condition reported would be the total of all subsystem points received as a percentage of the maximum possible points for the number of subsystems rated.
- Age
Years since the facility was completed and opened for use.
- Remaining Useful Life
The estimated number of years which the facility will be able to carry out its intended purpose before replacement.
- Replacement Cost
The estimated purchase price of in-kind replacement of the facility on the existing site at the end of the remaining useful life.

Facility Code			
01	Power Distribution Substations	13	Incline Railway
02	Tunnels	14	Track System
03	Bridges	15	Overhead Power Distribution System
04	Elevated Right of Way/Track	16	Passenger Amenities (Shelters, Restrooms, etc.)
05	People Mover	17	Terminals, Intermodal
06	Transit Center	18	Toll Booths
07	Boarding Platforms/Stations/Floats	19	Uncovered Bus Storage
08	Pedestrian Access Facilities	20	Covered Bus Storage
09	Park and Ride Lots	21	Wash Islands/Fuel Islands
10	Administration Building	22	Warehouse/Storage
11	Maintenance Building	23	Multifunctional (Ops. and Maint.; Ops. and Admin.)
12	Rail Yards/Shop	24	Other

Facilities Description Form — Item 1 from the Facilities Inventory Form should match Item 1 on this form. Additional copies of the Facilities Description Form should be made to match the items in the Facilities Inventory Form.

Description A complete description of the facility including information on the exact location, size, and function(s) of the facility.

Comments If there are any issues related to the facility which are considered significant, they should be noted. Examples might be plans for rehabilitation, elimination, or anticipated relocation of some functions from this site to another. If problems are being encountered with specific subsystems, this would be the place to note such problems. Issues of ability to address regulatory requirements might be noted here.

Point Score Definitions for Facility Condition Assessment

100	Requires routine preventive maintenance.
80 - 90	In good working order, requiring only nominal or infrequent minor repairs.
50 - 70	Requires frequent minor repairs or infrequent major repairs (more than six months between repairs).
20 - 40	Requires frequent major repairs (less than six months between repairs).
10	In sufficiently poor condition that continued use presents potential hazard.

Subsystems to Be Evaluated as a Part of a Facility if Existing Within the Facility

- Heating, ventilation, and air conditioning systems (HVAC)
- Roof
- Structure (walls, floors, windows, and foundation)
- Electrical/lighting
- Parking/driving surfaces (includes track system in rail yard)
- Pedestrian access
- Water/sewer
- Functional capacity (does the current use exceed design capacity)
- Safety (alarms, detector, security, sprinkler, extinguishers, etc.)
- Communications (including signage)
- Accessibility (ADA)
- Mechanical (fixed or built-in) (examples might include vehicle hoists, elevators, cranes, delivery systems for fuel island)
- Fuel, fluid, or chemical storage

Washington State Department of Transportation				Public Transportation Management System Facilities Inventory			
Facility Code	Facility Name	Condition (points)	Age (years)	Remaining Useful Life (years)	Replacement Cost (\$)		
1.							
2.							
3.							
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Facilities Description	
1. Description:	Comments:
2. Description:	Comments:
3. Description:	Comments:
4. Description:	Comments:
5. Description:	Comments:

Washington State Department of Transportation

**Public Transportation Management System
Instructions for Rolling Stock Forms**

Every vehicle used primarily for the transportation of passengers shall be reported on the enclosed forms. The reporting shall be done by fleets. Fleets are defined as vehicles which are grouped because they have many common factors. An example would be a group of buses from the same manufacturer in the same year with the same fuel type. For the purposes of establishing a base year inventory, the information required will include: manufacturer; vehicle code; number of vehicles in this fleet; condition; age; remaining useful life; replacement cost; fuel type; and seating capacity. A more complete definition of these categories is provided below.

Rolling Stock Inventory Form

Fleet Manufacturer	The name of the manufacturer of the vehicle.
Vehicle Code	A table of rolling stock categories provided below assigns a code for each vehicle type.
Number of Vehicles	The number of vehicles contained in this specific fleet.
Condition	The reporting agency should apply the 100-point evaluation system listed below and report a score which indicates the average condition of all vehicles within that particular fleet. As an alternative, a score may be developed by using a 10-point scale applied to each of the vehicle subsystems. A list of potential vehicle subsystems is provided below. The vehicle condition reported would be the total of all subsystem points received as a percentage of the maximum possible points for the number of subsystems rated.
Age	Years since manufactured.
Remaining Useful Life	The estimated number of years which the vehicle will be able to carry out its intended purpose before being replaced.
Replacement Cost	The estimated value of in-kind replacement of the vehicle at the end of the remaining useful life.
Fuel Type	Possible examples include diesel, gasoline, and compressed natural gas.
Seating Capacity	Number of seats available to the public (includes driver for rideshare vehicles).

Rolling Stock Comments Form — Item 1 from the Rolling Stock Inventory Form should match Item 1 from the Rolling Stock Comments Form. Additional copies of the Rolling Stock Comments Form should be made and numbered to match the items on the Rolling Stock Inventory Form.

Comments
 If there are any issues related to the vehicle fleets which are considered significant enough to be noted, they should be reported here. Examples might be plans for rehabilitation or identification of “lemons” within a specific fleet. If problems are being encountered with specific subsystems, this would be the place to note such problems. Comments related to ADA or Clean Air Act compliance should be included.

Rolling Stock Vehicle Codes

01	Bus - 40 ft.	15	Rail Cars - LRT
02	Bus - 35 ft.	16	Rail Cars - Rapid
03	Bus - 30 ft.	17	Rail Cars - Commuter Self-Propelled
04	Bus - <30 ft.	18	Rail Cars - Commuter Trailer
05	Bus - Articulated	19	Rail Cars - Trolley
06	Bus - Intercity	20	Rail Cars - Intercity
07	Bus - Trolley	21	Locomotive
08	Bus - Trolley Articulated	22	Cable Car
09	Bus - Double Deck	23	People Mover
10	Bus - Dual Propulsion	24	Car - Incline Railway
11	Cutaway (under 30 ft.)	25	Fixed Guideway Cars (e.g., Monorail)
12	Body-on-Chassis (under 30 ft.)	26	Ferry Boats
13	Van - Vanpool	27	Streetcar Replicas
14	Van - Special Service	28	Other

Point Score Definitions for Rolling Stock Condition Assessment

100	No major problems, only routine preventive maintenance needed.
80 - 90	Good working order, requiring only nominal or infrequent minor repairs.
50 - 70	Requires frequent minor repairs or infrequent major repairs.
20 - 40	Requires frequent major repairs (less than six months between repairs).
10	In sufficient poor condition that continued use presents potential problems.

Subsystems to Be Evaluated and Averaged for Vehicles Existing Within Each Entire Fleet

The evaluation process identified above will be applied.

- Engine
- Drive-train
- Electrical
- Suspension/Steering
- Structure
- Body - Interior
- Body - Exterior
- A/C, Heating
- Brake System
- Wheelchair Lift (0 score for non-lift equipped)

Washington State Department of Transportation										Public Transportation Management System Rolling Stock Inventory			
Fleet Manufacturer	Vehicle Code	Number of Vehicles	Condition (points)	Age (years)	Remaining Useful Life	Replacement Cost (\$)	Fuel Type	Seating Capacity					
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Rolling Stock Comments

1. Comments:

2. Comments:

3. Comments:

4. Comments:

5. Comments:

6. Comments:

7. Comments:

University of Washington — Measuring Level of Service and Performance in Public Transportation

Following are two University of Washington research papers that were prepared as part of the Measuring Level of Service and Performance in Public Transportation research project conducted for WSDOT. The first paper, *The “Level of Service” Concept and Public Transportation Assessment Case Studies*, explores the concept of Level of Service (LOS) as it applies to local and regional public transportation. The case studies contained within this paper are provided as part of WSDOT’s technical assistance to local providers and regional planning agencies. Public transportation LOS is a required inclusion within local Comprehensive Plans in Growth Management Act (GMA) counties and also has potential as a useful tool in urban congestion management.

The second University of Washington research paper, *An Access Assessment Framework for Washington State*, is intended as a preliminary working paper and its purpose is to present a focal point to start discussions on defining a minimum level of access for Washington’s citizens. The purpose of the Access Assessment Framework is to measure the level of access to public transportation, to define a minimum desired level of access that should be attained everywhere, and to map the level of access across the state. The paper develops a proposal for measuring and mapping access to transportation, using Geographic Information Systems (GIS) software. With these tools, progress can be measured towards the goal of providing some form of transportation alternatives everywhere in the state.

Draft Working Paper 2.1

Research Project T9223-45

"Measuring Level of Service and Performance in Public Transportation"

The "Level of Service" Concept and Public Transportation Assessment

Case Studies:

I) LOS and Basic Regional Accessibility

II) LOS, Growth Management and Concurrency

III) LOS Regional Mobility, Congestion, and Air Quality

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Washington State Department of Transportation
Technical Monitor
Valerie Rodman
Office of Public Transportation

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Abstract

The development and application of LOS definitions for public transportation is a very complicated undertaking. This paper examines three different types of application contexts where the LOS term, and more broadly performance evaluation, are being used to guide the provision and evaluation of public transportation activities. The examples include: Case I an application concerned with basic regional accessibility and mobility issues in rural areas; Case II an application involving the integration of public transportation with growth management planning; and Case III a discussion of the multi-modal application of LOS frameworks where public transportation is treated primarily as a transportation control measure for congestion and air-quality management. The observations from this analysis present detailed accounts of how the traditional understanding and definition of LOS based on isolated indicators disconnected from the broader process of evaluation is insufficient for guiding public transportation delivery and evaluation. This report strongly suggests that the WSDOT adopt a flexible LOS and performance evaluation framework capable of addressing the broad range of public transportation facilitation and evaluation roles it must serve. Overall, this conclusion is supported by the complicated expectations for public transportation and the multi-level institutional environment associated with its delivery in Washington State

1.0 Introduction and Background

This paper examines three current transportation planning situations in Washington State in order to better understand how to interpret and apply the concept of level of service (LOS). The first example explores the on-going developments designed to initiate a new public transportation service in the far-western reaches of the Olympic Peninsula. This case highlights the state's interest in **basic regional accessibility issues in rural areas**. The second example examines the development of local LOS criteria under Growth Management planning in three King County cities: Bothell, Kent, and Seattle. In this case, the purpose of LOS is primarily related to **concurrency** issues. The third example examines a multi-modal transportation corridor in the Puget Sound Region (Everett-to-Seattle) where the dominating concerns are **regional mobility, air quality, and congestion** in addition to accessibility. In total, these examples highlight why a state-level approach to LOS and performance assessment needs to be comprehensive, yet flexible, in order to facilitate effective transportation planning and decision-making across the wide variety of contexts found in Washington State.

In general, in order to understand the full implications of LOS and performance measures related to any particular public transportation activity or policy it is necessary to look at a broad range of indicators that reflect different aspects of assessment. However, each of the case-study examples suggests that certain key issues, relative to defining LOS for public transportation, may be more important than others, at least as a starting point. The route planning example seen in the Olympic Peninsula case study rests on the relative distribution of activities with effectiveness and equity issues as the framing criteria of concern. A focus on such criteria shapes how community groups and providers evaluate the particular strengths and weaknesses of specific activities and, where an issue, provides a systematic approach to making difficult equity trade-offs.

In the growth management example the starting point, defined by state legislation, is the requirement to identify the current amount of activity for present conditions and the amount of activity necessary to accommodate future growth plans. This needs assessment process is also required to consider the costs associated with the current and future levels of activity provision. The linkage to funding issues is meant to provide a fiscal balance for community planning goals. The case study points out, however, that a central problem with LOS application in many Washington communities, especially those within a metropolitan area, is the fact that public transportation is not generally provided by individual municipalities even though they are responsible for relating transportation needs to growth management plans.

The multi-modal corridor case-study emphasizes transportation system outcomes and community outcomes. In this case, the legislative motivations of ISTEA (congestion management) and the Clean Air Act (clean air) provide the primary reference point for examining the relationship of LOS criteria with transportation policies to address these important issues.

In two companion working papers we outline a detailed consideration of the elements of transportation provision and evaluation as related to performance assessment and level of service (LOS) (Hodge et al., 1994; Orrell et al., 1994). In those papers we suggested that the evolving character of "level of service" and performance measurement, as applied in transportation, could best be understood in terms of the broad process of evaluation normally applied to any public service or good. This interpretation was contrasted with the traditional focus of LOS and performance assessment in transportation based predominantly on the amount of service provided.

The framework we outlined in our conceptual discussion of LOS (Working Paper 2.0) and performance assessment (Working Paper 14) is reproduced in Figure 1. As we noted in those earlier papers, this framework essentially describes the practice of transportation planning that begins with the identification of **goals** as a high-level guide for the provision of transportation activities and more specific **objectives** related to these goals. In the case of public transportation, this process generally results in goals and objectives such as mobility for the transit dependent, reducing automobile use, and contributing to air pollution reduction.

Given the widely accepted character of these goals and objectives in public transportation, the practical focus of the planning process primarily centers on the remaining elements in Figure 1. At this level, the planning process begins with some financial and resource **inputs** that are used to provide some mix of public transportation **activities** to which there is some **response** in terms of use by the public. These activities and the response to them, in turn, hopefully have some beneficial **outcomes** on the performance of the transportation system and on the other broader community concerns the activities are designed to address. Finally, and again in an ideal sense, the response to the activities provided and the outcomes of public transportation on the transportation system and on the other community needs should be considered in terms of the original objectives, inputs, and the mix of activities provided.

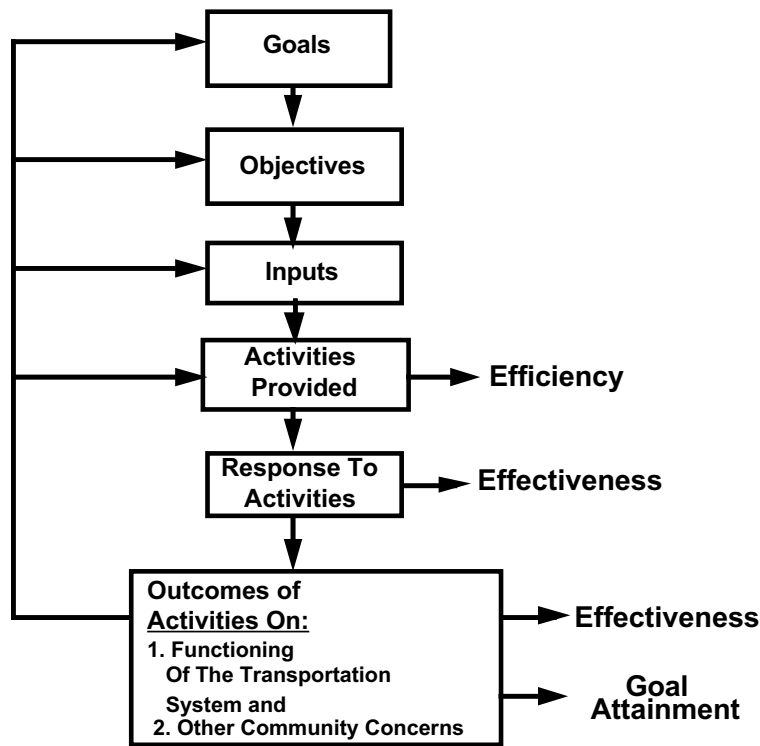


Figure 1. Basic elements in the process of public transportation provision and evaluation.

The other elements in Figure 1, **efficiency, effectiveness, and goal attainment**, relate most closely with the performance assessment process (see Working Paper 1.4). These elements in essence represent the indicators that help assess the degree to which the original goals and objectives are attained and the relative efficiency of the results. In this paper these elements are included in the discussion of case studies on LOS as an integral part of the overall performance assessment process.

Various defined in the transportation literature, efficiency and effectiveness can be understood from the perspective of this research as illustrated in Figure 2. **Efficiency** generally refers to *the amount of some input to provide some activity*, whereas **effectiveness** generally measures *the response or outcome per input or activity provided*. While the term ‘efficiency’ can have much more broad meanings, in public transportation it has generally been used to refer to the use of inputs to provide an activity, which is how the term is also used in this paper. The definition of effectiveness in Figure 2 also notes the inter-changability of numerator and denominator. Both cases are commonly found in the use of performance indicators in public transportation planning as related to the concept of effectiveness (e.g., passengers/vehicle mile and vehicle miles/passenger).

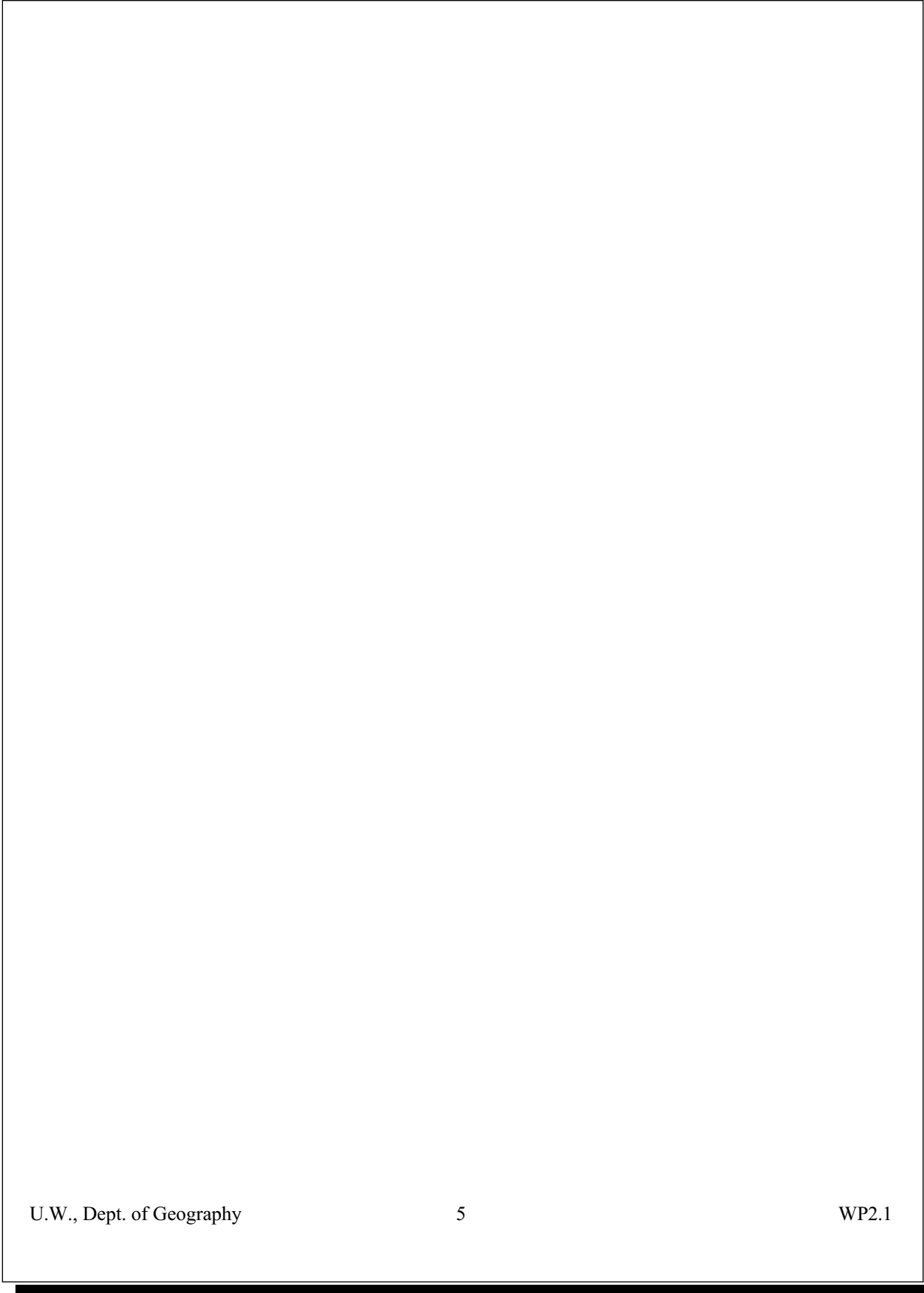
$$\text{Efficiency} = \frac{\text{Input}}{\text{Activity}}$$

$$\text{Effectiveness} = \frac{\text{Response or Outcome}}{\text{Input or Activity}} \quad \text{or} \quad \frac{\text{Input or Activity}}{\text{Response or Outcome}}$$

Figure 2. Concepts of efficiency and effectiveness

We use the concept of effectiveness in relation to both the effectiveness of public transportation activities normally defined in terms of such transportation responses as ridership and also in terms of other outcomes. In the latter case the concept of effectiveness is closely related to the assessment of **goal attainment** or the extent to which goals and objectives of any given activity are attained. The differentiation between effectiveness, in an outcome sense (e.g., mode split of the overall transportation system/ vehicle hours of public transportation) primarily relates to an attempt to assess the incremental change (outcome) relative to the inputs or activities applied. A good example of goal attainment assessment can be seen in the attempts to assess ridership elasticities based on different bus fare levels. We have suggested in previous work that the relationship between ridership and fares changes dramatically under fare-free policies (Hodge et al., 1994b). Where the goal is to maximize system ridership, one effective goal-oriented strategy is to remove the fare box. Effectiveness could be measured as the additional costs of providing fare-free service divided by the change in ridership (i.e., cost/new rider). Goal attainment would be expressed in terms of the extent to which explicit ridership or mode-split goals had been achieved. The policy decision to pursue such a strategy must, of course, be carefully weighed with other goals and objectives for a given system.

This paper proceeds with the framework outlined in Figure 1 as its central organizing device. Each of the problems in the case studies is explored in terms of these basic elements of public transportation provision and evaluation using specific examples and indicators. Hopefully, the examples chosen are representative of common planning situations thereby allowing others to adapt this framework and the examples to other areas. A second motivating purpose for this particular paper is to assist WSDOT in defining their LOS and performance assessment approach. Thus, at the end of each case study and in the overall conclusions we discuss the implications of alternative approaches to LOS definition and application.



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WP2.1

2.0 Case Study I: LOS and Basic Regional Accessibility

The example in this section examines the role of public transportation for basic regional accessibility in a sparsely populated rural corridor on the Olympic Peninsula (between Forks, WA and Aberdeen, WA). This particular context is an economically depressed part of the state due to the on-going adjustments in the timber industry, it includes several Indian tribes, and it represents a major tourist destination because of the Olympic National Park and scenic coast line. The central planning question is to determine whether or not public transportation services are warranted.

The discussion that follows is organized in three parts. First, the paper provides a brief background statement of the problem. Second, it reviews how local public transportation providers, local community interests, and the Washington State Department of Transportation (WSDOT) have, to date, approached the assessment of the situation in terms of the elements in Figure 1 and explores how this assessment problem may be more comprehensively approached. Third, it discusses the implications of this example for the broader concerns of WSDOT in their desire to develop an overall LOS/Performance assessment framework.

2.1 Background

This planning problem was stimulated by local community members who argued that fixed-route public transportation was needed in the corridor primarily to meet basic socio-economic needs and secondarily because of its potential benefit to tourism. Their desire was to have some regular service that would connect with existing Clallam Transit Service in Forks and with existing Grays Harbor Transit Service that extends from Aberdeen to the Lake Quinault area.

Jim Conomos, the owner of the Rain Forest Hostel located between milepost 169 and 170 on Highway 101 near the Olympic National Park, has been instrumental in organizing the community in this matter. The grass-roots effort culminated with a public meeting in November of 1993 where approximately 160 local citizens presented testimony to regional transit providers (Jefferson Transit, Clallam Transit, Grays Harbor Transit) and WSDOT. A statement made by a Native American woman from Queets at this meeting, as related in a personal recount by Jim Conomos, summarizes the perceived need for service:

"Don't you understand what its like to live out here without a means to get anywhere?"

The result of the November meeting was the organization of a citizen group-transit provider working committee that has subsequently outlined an initial proposal for

service that would provide two daily round trips between Forks and Lake Quinault Monday through Saturday. Twenty-thousand dollars has been committed by each of the three regional transit providers and it appears that the National Park Service will provide the additional fifteen thousand dollars needed for the first year of service. WSDOT has committed \$75,000 in matching funds for one year from their FTA Section 18 funds designed to facilitate inter-city transportation services in rural areas bringing the one-year allocation of funds for this activity up to \$150,000.

The responses of local transit providers to community requests for service and the financial support of WSDOT in this matter raises a number of interesting LOS and performance assessment issues both for the initial year-long service demonstration and for longer-term evaluation of public transportation in this context and others like it. Under normal circumstances (i.e., in the absence of a grass-roots uprising), and using traditional LOS criteria, the extreme rural character of this area would likely result in the conclusion that no regular fixed route services were warranted. In fact, this was the pre-existing conclusion of Jefferson Transit which had the area targeted for community vans with volunteer drivers in their six-year transit comprehensive plan. Effective community pressure, and the timely matching grant from WSDOT, pushed the citizen-lead process towards implementation of the route. However, all of the interests in this effort have proceeded to this conclusion without explicit assumptions about how the service will be evaluated for success or failure after the initial funds run out.

In the following section we outline how the assessment process has proceeded to date in terms of the overall framework of LOS and evaluation presented in Figure 1. The purpose of this analysis is to reveal how the ad hoc approach to this situation has placed an emphasis on some dimensions while overlooking other important issues that should be explicitly considered. This analysis also reveals the inherent difficulty of attempting to determine LOS thresholds in isolation from other elements of evaluation.

2.2 Perspectives on Assessment To Date

The discussion in this section is centered on the summary of issues outlined in Table 1. The purpose of Table 1 is to highlight where emphasis has been placed in the planning process, to date, by the three groups engaged in the discussion about the proposed service. The purpose is also to reveal the dimensions of assessment that have not been explicitly emphasized. Question marks are used to highlight the fact that the element has not been explicitly emphasized in the planning process to the best of our knowledge.

The table is organized starting in Column 1 with the list of assessment elements outlined in Figure 1. The second column summarizes the central types of questions related to LOS concerns typically associated with each of these elements. These

questions are provided as point of reference for the reader to assist in the interpretation of how LOS relates to the particular issues raised. The remaining columns present the issues, and perspectives, raised by each of the parties involved in this situation (i.e., regional transit providers, the community group, and WSDOT) as summarized from personal interviews. The table is designed to help portray, at a summary level, how this particular public transportation planning problem is currently valued by the parties involved as a starting point for facilitating further discussion about how to more fully assess the relevance of the service going into the demonstration and for guiding evaluation at the end of the year. The table also reveals those aspects of LOS and the provision of public transportation that have not yet been considered and which may, or may not, prove relevant to the search for appropriate solutions.

Table 1. Summary of Issues In Relation to Elements of Evaluation

Evaluation Element	LOS Questions	Providers	Community	WSDOT
Goals and Objectives	What LOS measures relate to the goals and objectives for the activities?	Local accessibility to Forks and Aberdeen.	Local, regional and state-wide accessibility.	Broad accessibility and mobility concerns including basic social-economic issues.
Inputs	What is the amount of inputs (e.g., \$, seats, vehicles) per area, per person, per mode? How do these amounts compare to other routes or areas?	Who is going to pay for this additional service short and long term?	Equity issues related to public transportation expenditures? "The area deserves the service." Why spend \$5 million on a multi-modal center in Port Angeles when basic needs are unmet?	One-time matching grant instrumental in moving service forward. Current State transportation policy does not allow long-term operating support.
Activities	What are the amounts of access to services or facilities, the number of scheduled trips, the quality of trips? What amounts would be appropriate for other LOS levels?	Concerned with reliability and quality of service if provided by local contractors.	Concerned about frequency of service. Citizens and local school district want three round trips per day..	Concerned with maximizing service hours; meaningful service level relative to total needs.
Efficiency	How does the efficiency of service provision affect the LOS that can be provided?	What is the best type of service (fixed-route or demand-response)?	Citizens are willing to settle for two round trips based on the financial analysis of providers.	Interested in relative cost efficiency for private contracting as a means to maximize service hours.

Response To Activities	How much use is made of the service? How does this level of use compare to other similar services (e.g., other fixed route services) in terms of absolute trips? How does it compare to alternative activities (e.g., community vans)?	No formal analysis. Expectations are low.	No basis, experience, or resources to make such estimates. Expectations are high about the number of people who will use the service.	?
Effectiveness	How effective is the LOS provided based on the response and inputs used (e.g., how many users per hour or trip segment; what cost per user)?	?	?	?
Transportation System Outcomes	What effect does the current LOS have on the transportation system? What effect would other LOS have?	?	Emphasize potential for connecting with future National Park shuttles to trail heads. (congestion)	?
Community Outcomes	What effect does the current LOS have on other community concerns (e.g., social-economic concerns)? What effect would other LOS have?	?	Emphasize a great deal of community benefit in terms of mobility and accessibility.	Expected, but unquantified, social and community benefits from increased accessibility.

<p>Goal Attainment</p>	<p>How well are the goals addressed with the current LOS(i.e., what results are achieved for the amount invested)? How well would they be addressed for alternative LOS?</p>	<p>?</p>	<p>?</p>	<p>?</p>
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WP2.1

2.2.1 Goals and Objectives

The goals and objectives for the service seem to be clearly understood as primarily related to basic accessibility concerns by all of the parties involved. There are, however, some differences in the scale of concern over accessibility and the importance of the service as a result. The citizen group, as articulated by Jim Conomos, seem to place a good deal of value not only on local and regional accessibility to Forks and Aberdeen but also to points outside the region. They see the service as a basic link for themselves, family, friends, and to a lesser extent tourists, for destinations such as Seattle and Portland. Without the critical link represented by the proposed service many of the citizens in the area feel cut-off from social, economic, and educational opportunities outside of the area.

The regional transit providers are sympathetic to these broader accessibility concerns but have characterized the problem as one primarily related to local accessibility to Forks. A major reason for this may be related to the fact that the corridor involves three Public Transportation Benefit Areas (PTBA), hence three different providers. The development of the proposed service has required an additional effort to work out the details of provision. Thus, in this case we see how the arbitrary boundaries of PTBA (primarily based on county borders) may affect the delivery of public transportation activities. This is not unique a case there are a number of other corridors in Washington State where institutional boundaries are impediments to travel demand.

From a state-level perspective, accessibility issues are viewed as a critical part of the mandate of the Public Transportation Office at WSDOT. Their active participation in this situation has been motivated by basic accessibility concerns (i.e., the basic ability of people to get to needed social and economic opportunities). These concerns represent a central part of the emerging articulation of WSDOT goals and objectives as seen in several State Planning Objectives and preliminary Action Strategies related to these issues including:

Objective: Create a network of statewide public transportation services and intermodal facilities.

Action Strategy: Identify a statewide intercity, multimodal public transportation network and linked intermodal facilities, vital to the state interest.

Objective: Improve mobility in small urban and rural areas.

Action Strategy: Forecast demand for public transportation services in small urban and rural areas, identify deficiencies and proposes solutions and monitory demand every four years.

Although each of the parties may use the same terms to describe the transportation goals and objectives of the proposed service, it is clear that there are some differences in the way each perspective values the basic notion of accessibility. Part of this valuing process is itself influenced by the jurisdictional boundaries of any given providers. In this case, these artificial boundaries represent barriers to the design and delivery of services that serve a regional need.

2.2.2 Inputs

As noted above, \$150,000 dollars has been budgeted for the proposed service. The current understanding is that approximately \$120,000 would be dedicated to operating costs and \$20,000 for vehicle lease and radio equipment. The use of the remaining \$10,000 is not detailed but assumed to be for miscellaneous overhead or unforeseen contingencies.

These fund allocation issues obscure fundamental concerns over inputs needed to provide the service. From the provider's perspective the concern over the source of financial inputs appears to be central to their approach to this planning problem. In other words, where will they get the money to fully support the service after the state funds run out if the citizens actually use the service in sufficient numbers to warrant its continuation? This concern was echoed by the manager of Clallam Transit in a front page article in the major regional newspaper.

"Fredrickson (Manager of Clallam Transit) expressed concern that if funding for the second year isn't developed, that the transit systems that invest initially would be stuck with a far greater investment in the next year." (Front Page of Port Angeles Paper)

The citizen groups, on the other hand, have argued their position from an equity perspective. That is, they have argued that they deserve the service from the position of an equitable distribution of county, and region-wide, public transportation tax revenues. This perspective suggests that LOS measures should be related to the amount of inputs per area or person. The citizen groups further argue that because of the extremely depressed local economy, public transportation funds invested in their area are even more important than in other places in Jefferson County and even state-wide. In effect, they look at the funds invested in this area as having greater inherent value than funds spent elsewhere.

WSDOT obviously empathizes with local citizens and has stepped forward with the funds that have made the current plans for service development possible. This seed money appears to have provided a relatively painless resolution of the current conflict but with the longer-term status of the service uncertain, it is clear that the evaluation of this situation needs to be made more explicit. WSDOT as the key facilitator needs to help the parties involved better articulate how the evaluation of success or failure of the service will be undertaken. This issue cannot be resolved merely by looking at inputs. Rather, additional elements in the provision and evaluation process also need to be understood. From a policy perspective, WSDOT's current policies do not allow for state support of operating costs for public transportation activities and this issue may need to be further explored for cases such as this one where the inter-jurisdictional character of the service and its apparent regional, and state-wide, significance are at stake.

2.2.3 Activities Provided

A traditional approach to LOS evaluation would enter this problem by attempting to define LOS in terms of **quantity of activity** such as frequencies of service or headways. As noted in Working Paper 2.0, there are many candidate measures that can be used for defining the amount and/or quality of activities provided. This type of approach is proposed as one of the LOS indicators in the Peninsula Regional Transportation Planning Organization (RTPO) draft regional transportation plan which ranks level of service by the number of scheduled trips differentiated for urban and rural routes.

The issues of greatest concern among the primary parties can be seen emphasizing two different perspectives related to the type and quantity of activity. The central concern among the citizens is frequency of service in terms of the number of round trips per day. The citizens, including the school district superintendent representing the local school in the corridor, feel three round-trips per day are really necessary to meet all of the needs in the area and potentially to support some pupil transport particularly for extra-curricular activities. They appear willing, however, to accept the providers' financial conclusions that only two round trips are possible in order to get some service in place.

The regional transit providers on the other hand have emphasized other concerns over reliability and quality of service relative to existing regional services framed within the explicit concern over costs. WSDOT is approaching the issue of amount of service from the citizens' perspective and has actively pursued the cost issue in terms of maximizing service hours.

This example demonstrates how consideration of amount of service to be provided is constrained by other financial issues. The discussion about LOS for this case is as much about cost efficiency (considered more fully under the cost efficiency section below) as it is about what service level is most appropriate to meet some demand. This

issue is currently unresolved as the lead transit agency, Jefferson Transit, prepares a request for proposals (RFP) to determine whether a private contractor is interested in undertaking the service, possibly at the increased level desired by the citizens.

Under the current proposal for 2 daily round trips over the 67 mile route the total daily operating time would be approximately 7 vehicle hours per day. Weekly, this totals 42 vehicle hours (Monday through Saturday) and annually 2184 vehicle hours. If service were to include 3 daily round trips this would represent approximately 10.5 daily vehicle hours, 63 weekly vehicle hours, and 3275 annual vehicle hours. These estimates and others calculated in this section are summarized in Table 2.

The primary conceptual question about LOS that emerges from this example is how to use LOS standards. Should LOS criteria that emphasize the quantity and quality of activities be established as the central determinants of planning policies or should they be treated as a starting point in a more flexible approach? This particular example amplifies the importance of these issues because it involves a situation where services do not currently exist. An approach to LOS based on recommended service standards for rural contexts might have precluded consideration of the proposed service option altogether. It remains to be seen whether or not the proposed fixed-route services are indeed warranted, but if the local community and regional users of the service respond adequately to the provided service it would seem to support a more flexible, community-determined, approach to LOS issues.

Table 2. Summary of Estimates

Evaluation Element	Scenario 1	Scenario 2	Observations
Goals and Objectives	Basic Accessibility	Basic Accessibility	Need to better define local and regional components of accessibility need.
Inputs	Operating Costs 120,000	Operating Costs 120,000 or 150,000	Long-term funding resolution may involve equity considerations
Activities	2 trips per day Daily Vehicle Hours = 7 Annual Vehicle Hours = 2184	3 trips per day Daily Vehicle Hours =10.5 Annual Vehicle Hours = 3275	Need to carefully explore the type of activity provided and private vs. public provision.
Efficiency	Cost per vehicle hour = \$55	Cost per vehicle hour = \$37-\$46	What are the alternatives for contracted services?

Response To Activities	Passengers Per Day=40 Per Year= 12,480 Annual Passenger Miles?=250,000	Passenger Per Day=60 Per Year = 18,720 Annual Passenger Miles?=375,000	Need information about who uses the services and why.
Effectiveness: Activity Cost	Passengers/Hour = 5.7 Cost/ Passenger = \$9.60 Cost/Passenger Mile = \$0.48	Passengers/Hour = 5.7 Cost/ Passenger = \$6.40 Cost/Passenger Mile = \$0.32-\$0.40	Estimates appear to be comparable to other rural routes operated within the region where: Passengers/hour = 3-5; Cost/passenger = \$11 Cost/passenger-mile=\$0.73
Transportation System Outcomes	Additional information about new trips, mode-split, congestion-relief potential could be collected.		
Community Outcomes	Additional information/documentation about economic and social outcomes of service are necessary.		
Outcome Effectiveness and Goal Attainment	Accessibility needs vs. activity provision need to be documented and used to assess public transportation activity alternatives and goal attainment.		

2.2.4 Efficiency Issues

The issue of efficiency has not been fully explored as part of the public debate over the service proposal, although, as noted above, it has been invoked in the discussion of how much service can be provided given the available funding. We define the term efficiency to mean the amount of financial or resource input used in providing some level of public transportation activity (see Figure 2).

The evaluation of efficiency of the proposed service has centered on whether or not a private contractor, with lower overhead and labor costs, might be willing to provide the service (and potentially the extra service desired by the citizen group). Given the assumptions on annual operating costs (\$120,000) and annual vehicle hours (2184) the cost per vehicle hour for the proposed service would be approximately \$55 dollars if provided through one of the public transit agencies. This amount is consistent with averages for the fixed route services of all of the regional providers. Given the

assumptions about the three-round-trip per-day scenario, the hourly rate to provide the service would be approximately \$37-\$46 per vehicle hour depending upon which number is used as the total budget (\$120,000 or \$150,000/3275 hours).

Depending on the outcomes of the activity in the coming year, the subject of cost and activity efficiency may need to be further explored. The community groups, may for example, find that there is a greater need for more localized shuttle service, or community van, than a third round trip per day strictly along the highway 101 corridor.

2.2.5 Response To Activities

A critical part of the evaluation of public transportation activities relates to how many people actually use a given service. Typically, transit providers collect information on the absolute number of passenger trips and also estimate passenger miles by multiplying these totals by averages of the distance traveled per passenger. Response-to-activity measures provide important insight for any LOS and performance analysis involving public services. In the case of public transportation the use of such information allows providers and the public to make difficult trade-offs over the character and amount of service provided. Information about the response to similar activities in different places also allows for a relative comparison of how the services are valued by different constituencies. In the face of budget shortfalls and other equity considerations, the degree to which a service is actually used weighs heavily in decisions about which services should be continued, modified or cut.

In the current case the actual response to the proposed activities is unknown because the service has not yet been implemented. In addition, formal estimates of ridership have not been undertaken. The debate over whether or not this service is needed has centered on the perceived demand made by the two principal parties involved in the discussions. The general perception of the regional providers is that there is not enough demand for service in this area to warrant a fixed-route approach. This conclusion, as noted above, is based on an informal analysis of population densities in the area. The citizens in the region, on the other hand, believe that the demand for service does exist but they have no formal, "quantifiable" basis, nor experience in normal transit service estimating techniques to support their claims. They are also unaware of the relative performance of other existing routes in the region which might provide additional credibility to their own demands for service.

For the purposes of this analysis we explore the potential responses of the two different service scenarios identified above (i.e., 2 round-trips and 3 round-trips per day). For both cases we assume that 10 people will take advantage of the service on each of the daily one-way segments. Thus, for the first case of 2 round-trips per day, the total passenger trips would be 40 per day, 240 per week, and 12,480 per year. For the second case, the total passenger trips would be 60 per day, 360 per week and 18,720 per year.

Multiplying these totals by an average trip distance of 20 miles (approximately one-third of the length of the route) provides additional estimates for passenger miles. For the first case this equals 800 passenger-miles per day, 4800 per week, 250,000 per year. For the second case, this equals 1200 passenger-miles per day, 7200 per week, 375,000 per year.

2.2.6 Effectiveness Issues

The concept of effectiveness relates the inputs for some activity to the response generated to the activity or its other outcomes (Figure 2). The central difference between effectiveness and efficiency, as we have defined it, relates to the inclusion of response or outcome in the calculation of effectiveness. Inputs in this case can be either the amount of activities offered in terms such as vehicle hours or miles or the financial inputs used to procure the activities. This section discusses effectiveness strictly in terms of the public transportation activities and the estimated response to the activities. Section 3.1.8 discusses effectiveness more broadly in terms of other outcomes and goal attainment.

None of the parties involved in this process appear to have formally argued their interpretation of this planning problem from an effectiveness perspective. However, in order to more completely assess the relative merit of the current proposals and to set the stage for future discussions about service continuation and/or modification it is important that all of the parties make explicit the assumptions about effectiveness criteria. Two common types of effectiveness measures used in public transportation evaluation are activity and cost related. Activity effectiveness compares the response (i.e., number of passengers) to the amount of activity provided (i.e. vehicle hours or vehicle miles). Cost effectiveness compares the financial inputs per the response to the activity provided (i.e. costs per passenger or passenger mile).

Utilization of such criteria allows all of the parties involved in this problem to compare the relative effectiveness of the proposed service with service delivery in other parts of Jefferson and Clallam counties where similar rural fixed-route systems are offered. It also would allow any difficult equity decisions to be more completely evaluated.

Representatives from Clallam and Jefferson Transit suggest, from an **activity effectiveness** perspective, that 5 passengers per hour is common for rural routes and that cases of 1 to 3 passengers per hour are tolerated. The best routes in these systems appear to generate around 20-25 passengers per hour during peak periods. Using the assumptions from the previous sections, the proposed activities and their assumed response rates would result in 5.7 passengers/vehicle hour (40 trips/day/7 vehicle hours) as a daily average. This result would compare favorably, from an activity effectiveness perspective, with rates observed for other rural fixed route services. If the utilization is much less than this amount, then some modification of service, after considering other equity issues, might be necessary.

The **cost effectiveness** of the proposed service under these assumptions yields a total operating cost per passenger of \$9.60 (\$120,000/12,800) for two round-trips per day and \$6.40 per passenger (\$120,000/18700) for three round-trips per day assuming a private contractor. Assuming an average trip length of 20 miles for this extremely long route of 67 miles, the approximate cost per passenger mile for this service would be \$0.48 per passenger mile (\$55/5.7 passengers * 20 miles) for two trips a day or \$.32 -\$.40 per passenger mile (\$37 or \$46/5.7 passengers* 20 miles) for service provided by a private contractor. Assuming an average operating cost of \$55 dollars per hour on the regional systems, and an average passenger trip rate of 5 per hour, yields a cost effectiveness measure of \$11 dollars per passenger. Assuming an average trip length of 15 miles for 5 passengers carried over a one-hour period, the cost per passenger mile would be approximately \$0.73 per passenger mile (\$55 operating cost/ 5 passengers * 15 miles).

Thus it would appear that if the ridership rates assumed above are realized, the effectiveness of the service would be comparable and perhaps even better than similar routes in the region.

The discussion of effectiveness issues, particularly in a relative sense, thus provides further insight for evaluating LOS. The meaning of LOS, and our valuations of what service levels are meaningful and worth paying for in the face of limited funds for service delivery depend on many issues both directly related to a given context and relative to other contexts.

2.2.7 Outcomes of Activities

What does a given level of response, to a proposed level of activity, mean in terms of outcomes on the transportation system and outcomes on other community issues related to public transportation? How does a consideration of outcomes influence our understanding of LOS? This section illustrates how additional insight about the meaning of any given level of public transportation activity can be derived from an examination of outcomes.

In this case study, concerns with outcomes related to the transportation system itself have not been emphasized as a major factor in the planning discussions. The one issue that has been raised relates to the possibility that the proposed services may at some point in the future assist the Olympic National Park's parking congestion problem. This would result, according to service proponents, if the Park Service uses shuttles to ferry people from highway 101 to trail heads. Other possible considerations from a transportation system outcome perspective include measuring the number of new trips (by public transportation), the number of avoided trips by automobile (e.g., to pick up friends and relatives in Aberdeen as mentioned by Jim Conomos), and the change in overall mode-split.

Clearly, as stated in the opening section of this discussion, the most important outcomes to account for in this case relate to basic social/economic needs. In other words, what will the trips (or access) provided by this activity mean to the local users and to the community? Estimating these outcomes is perhaps the greatest challenge in public transportation evaluation largely because it attempts to value "benefits" that are often difficult or even impossible to quantify. Thus, it is not a surprise that the subject of outcomes has not been formally examined in the current discussion about the proposed service even though the citizen proponents have emphatically expressed that such benefits should weigh heavily in the decision-making process. Specifically, they have highlighted the basic social-economic benefits to residents and businesses via the additional access it will provide to regional employment and activity centers. Similarly, WSDOT in its advocacy role has stressed the expected social-economic benefits from public transportation provision.

The challenge from an assessment perspective is to measure value of these types of outcomes for individuals, the community and the state. We cannot do full justice to this topic here, but we do provide some examples of categories of social-economic benefits relevant to a focus on community outcomes.

First, to the extent to which the proposed services will provide additional jobs for individuals/families in the region there will be an increase in the overall community well-being. If the service is based in Forks, and if operating and maintenance money is spent locally, there may be additional economic benefits to the community strictly from initiating the service. Furthermore, if the development of this activity could somehow be targeted at retraining a displaced timber industry worker to provide the service additional community, and state, benefits might be realized (i.e., if this person's family were collecting state or federal social benefits the presumed avoidance of these social costs could be added to the social benefit).

Second, to some extent the enhanced accessibility for residents along the routes to employment, medical and shopping activities in Forks and Aberdeen may result in additional economic activity to regional businesses. .

Third, trips made by people traveling to Department of Social and Human Services (DSHS) facilities, and the direct costs of transportation related to these clients, could be avoided by the State. If DSHS case workers currently travel to meet or pick up clients at their residences, and if some of this travel could be avoided, then additional cost-avoidance savings from the service may be realized.

Fourth, to some extent there may be economic impacts from additional tourist related travel and spending as a result of the system. However, this assumes a significant number of additional trips by tourists that would not have otherwise not been made.

The most difficult category of benefits to estimate relates to the long-term social impacts for local residents as a result of the increased accessibility provided. The social and community benefits of trips that provide access for personal travel, educational and recreational opportunities are more difficult to value but nonetheless important to the people living in this isolated area and arguably for the state as a whole.

Documenting such social and economic issues, although difficult, would be extremely beneficial for assessing the proposed activity in this context and others like it. WSDOT may wish to facilitate such a study in coordination with the service development and delivery in order to more fully understand these issues.

2.2.8 Effectiveness and Goal Attainment

The concept of effectiveness was introduced above in terms of the public transportation activity, costs and ridership. Effectiveness can also be considered in terms of the other outcomes related to a given public transportation activity. Such evaluations provide the key link to examining how well the potential benefits compare to the activity costs and other inputs. This type of analysis also provides a connection for assessment of goal attainment as outlined in the overall introduction to this paper.

From a goal attainment perspective the primary interest for the current case is in ascertaining the extent to which the accessibility needs of the local populations are actually addressed by the activity provided. In the absence of any information about the number of people who actually need the proposed activities this is very difficult to assess and would require further research.

The central evaluation question related to a consideration of relative goal attainment relates to the trade-offs between results achieved, costs and social benefits. At what level do the costs of providing for each trip outweigh the social benefits achieved? Although, as noted above, it is extremely difficult to quantify all benefits questions such as would alternative activities like the community van approach, alone or in combination with the fixed route service, facilitate a higher degree of goal attainment are relevant?

The consideration of the degree of goal attainment is fundamentally a different process than considering the effectiveness of the activity in terms of absolute response. Whereas, absolute response rates alone or in combination with response effectiveness criteria give us some relative notions of the success of the activity in comparison to other similar activities, they do not lead us directly to consider how well the original goals have been addressed and whether or not other associated benefits are important to the evaluation of the activity.

2.3 Discussion

A traditional approach to LOS issues in public transportation for this example, particularly at the state level, would likely focus on a frequency of service standard. Such an approach would suggest that neighboring towns of a given population should have a minimum number of trips per day between them. This is in fact the proposed state-level approach to LOS in Oregon as documented in Working Paper 2.0.

In the example above, we have identified other LOS assessment issues that are relevant to this type of community/regional public transportation planning problem. For the current case, reliance on a limited consideration of LOS would have probably resulted in a conclusion, early on in this process, that service is not warranted. In essence, the result of such standards may have prevented the discussion of service delivery from even proceeding.

Approaches to LOS that consider only singular dimensions of service delivery and assessment in isolation may ignore critical assessment issues such as what types of services are provided, why the services may be needed or of value, how much they cost relative to alternative transportation choices, and the issue of equity. As this example demonstrates, these issues should not be secondary concerns in the LOS analysis of public transportation activities or policies.

These observations provide an opportunity to return to questions about the interests of WSDOT related to public transportation assessment. The outline of issues in Table 1 provides a revealing case study for development of WSDOT policy regarding LOS and performance assessment. Some of these issues such as the type and amount of activity, efficiency, response and effectiveness can potentially be quantified and examined in terms of relative performance (as noted in the text). Although there is a certain degree of sensitivity among providers regarding relative evaluation its application within systems (or regions) is common and a necessary part of weighing any given proposal for service development with existing system performance. In effect, the examination of these types of information provide a starting point for framing the evaluation of specific public transportation activities.

Similarly, the documentation of financial inputs can be readily approached from an aggregate quantitative perspective and from the perspective of equity which complicates the matter. Equity valuations based on per person or per area calculations require a certain degree of qualitative interpretation related to the economic condition of the area and the "value" of the activities for basic accessibility concerns. WSDOT's role as a facilitator and advocate for basic accessibility in cases such as this one requires a broader examination of what the money spent means to these people and the regional corridor. The challenge of these equity considerations related to inputs are compounded by the fundamental need to also assess outcomes and goal attainment. These issues are

not easily resolved and require some type of in-depth community documentation if they are to be better understood.

To a certain extent, the difficulty encountered with current attempts to define LOS for public transportation, relate to the fact that public transportation, as a public good, is a more complicated entity than other public infrastructure such as sewers and roadways. These other cases may best be described as utilities where the concepts of supply and demand adequately guide LOS determinations. Public transportation, on the other hand, is not strictly a utility; it is a public service where one of the main purposes is to provide accessibility options that are difficult to value in a strict supply and demand sense. For various reasons people, who are influenced by their circumstances (in this case perhaps the depressed local economy), other government policies such as parking restrictions, and the quality of service, will use and not use public transportation when it is offered. Thus, in order to understand the meaning of LOS, as applied to specific public transportation problems, it is necessary to consider more than the supply of the activities.

Such an approach to LOS and performance assessment does not provide simple prescriptive answers about where service is needed nor how much should be provided. Rather, it provides a flexible approach to guide LOS determinations and assessment. For the case of discussion in this example it does not resolve the problem, but it does provide a more systematic approach for examining the range of issues that are necessary to consider. Most importantly it provides a framework for examining the various interests and perspectives on the problems so all of the parties potentially affected by these decisions have access to the planning process.

3.0 Case II: LOS, Growth Management and Concurrency

This case study examines the development of local public transportation LOS criteria under growth management planning in three King County cities: Bothell, Kent, and Seattle. As noted in the introduction, one of the central purposes of development of LOS definitions within growth management is to meet the requirement of concurrency. According to the GMA, development of public services and infrastructure should be concurrent with population growth and assumed increases in demand for public goods. Public transportation is just one of the public goods defined in GMA which also addresses planning for parks, schools, other capital facilities and infrastructure. The application of the LOS concept as a concurrency tool thus focuses primarily on issues related to facility and service availability, capacity and demand.

The implications of LOS definitions for public transportation in growth management are, however, not limited to concurrency concerns. A central operating assumption of growth management planning is that public transportation activities will significantly assist in the achievement of community planning goals. This assumption presumes that provision of public transportation activities will result in greater non-SOV travel and eventually will facilitate more efficient community land-use patterns. Specifically, public transportation is expected to either help create different land-use patterns (e.g., through rail investments) or at least support the densification of existing, under-utilized, spaces in centers. Public transportation is also expected to reduce the need for single-occupancy-vehicle (SOV) travel and thereby avoid a number of detrimental environmental and transportation system effects. Some planners, for example, look to public transportation as a tool to maintain acceptable LOS (i.e., volume-to-capacity and/or delay) for automobile travel. In short, public transportation is expected to help maintain, or improve, the quality of life for Washington State residents or at a minimum the quality of life for automobile users. Taken together these other growth management planning goals represent a significantly different motivation for public transportation LOS definitions than that seen for concurrency. In order to understand and interpret the application of the LOS concept for growth management it is necessary to keep all of these various purposes for public transportation in mind.

The central transportation planning question of interest in this case study is to examine how local jurisdictions have chosen to define and apply LOS in their comprehensive plans. The adoption of public transportation LOS definitions, and standards, based on one or more of these purposes emphasizes fundamentally different goals that in turn suggest different outcomes for the potential success of growth management. The observations made in the case study subsequently point to several challenging questions about current Washington State public transportation policies and directions for change.

The discussion of this example proceeds first with background on Growth Management Act requirements as related to public transportation and LOS definitions. Second, the proposed LOS definitions in three different comprehensive plans are examined in terms of their treatment of the concurrency and financing issues in growth management. Third, the proposed definitions of LOS for public transportation are interpreted more generally for their correspondence with the categories of public transportation assessment outlined in Figure 1 as in the previous case study. In the final section an interpretation of these developments relative to the concerns of growth management and more broadly for the state's interest in public transportation policy are offered.

3.1 Background

One of the requirements of Growth Management in Washington State is that all affected cities and counties preparing Comprehensive Plans must include LOS definitions and standards for public transportation. **Specifically, the GMA requires, at a minimum, LOS criteria for arterials and transit routes¹.**

RCW 36.70A.070.b.ii: The facilities and services needs sub-element of the mandatory transportation element in comprehensive plans shall include "level of service standards for all arterials and transit routes to serve as a gauge to judge performance of the system. These standards should be regionally coordinated."

WAC 365-195-325 makes the following recommendation as to how to meet the above requirement: "Provide a definition of level of service (LOS) to be adopted for the transportation system that includes at least arterials and transit routes. The definition of LOS is not restricted to the traditional Highway Capacity Manual approach, but could include district, area-wide, corridor or other nontraditional LOS standards. Provide an inventory of the current LOS of at least arterial and transit routes. Adopted LOS standards should reflect access, mobility, mode-split, or capacity goals for the transportation facility depending on the surrounding development density and community goals, and should be developed in consultation with transit agencies servicing the planning area."

Further guidance is given implicitly in the definitions of terms in WAC 365-195-210: "Level of service" means an established minimum capacity of public facilities or services that must be provided per unit of demand or other appropriate measure of need. "Transportation level of service standards" means a measure which describes the operational condition of the travel stream and acceptable

¹ This information was previously presented in Working Paper 1.1 (Hodge et al., 1993) where we correlated WSDOT Public Transportation Goals with recent legislative initiatives affecting public transportation.

adequacy requirements. Such standards may be expressed in terms such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience, geographic accessibility and safety.

36.70A.070.6.b.ii: The transportation element should also include "specific actions and requirements for bringing into compliance any facilities or services that are below an established level of service standard."

Growth management also explicitly requires that the financing of transportation improvements be considered as part of the LOS definition and needs assessment process. Where current or future funding falls short of cost estimates to support the identified needs, GMA requires reexamining LOS standards and/or developing other funding sources to balance any shortfalls.

The guidelines for GMA offer a range of possibilities for LOS definitions as related to public transportation as seen in the above references. These various options include mobility, accessibility, travel time, mode-split etc. The GMA guidelines for LOS definition also suggests that LOS approaches should take into account the demand for the services or other appropriate measures of need.

The various implications of selecting one or another of these concepts as LOS criteria was discussed in Working Paper 2.0 which suggests, parallel to GMA, that to fully understand what a LOS approach means requires a connection to funding, demand or need, as well as outcomes (i.e., transportation system and community goals). The guidelines of GMA are not specific in terms of how to apply these various definitions nor do they recommend particular target values for any of the categories. It is important to note that **there is nothing in the legislation that prevents the adoption of a LOS definition based on more than one type of indicator**. Ultimately, the selection of LOS definitions and standards, or perhaps more appropriately LOS frameworks, are left up to local community planning decisions.

Given the wide range of possible LOS definitions under growth management, the required connection to funding issues and implied connections to demand or need and other community goals, which of the various LOS concepts have local jurisdictions chosen to pursue and why? More importantly, what can communities expect from these approaches in terms of public transportation activities and the expressed goals and objectives for these activities to improve transportation and land-use linkages under growth management? In the following examples the analysis shows how, despite the apparent flexibility in LOS definitions provided for by GMA, the selected jurisdictions in King County have focused on single dimensions of assessment in their respective approaches to public transportation LOS definition.

3.2 Selected Local Approaches To LOS in King County

The Cities of Bothell, Kent, and Seattle, like all other municipal jurisdictions in King County, do not themselves provide any fixed-route public transportation activities. Currently, METRO-King County collects tax revenue, provides, and oversees, all local public transportation activities within the county. The result of this financing and provision arrangement has complicated and restricted the development of public transportation LOS standards within local comprehensive plans. Each of the three cases examined represents a slightly different reaction to the current institutional relationships that gives METRO authority for all public transportation provision while comprehensive growth management planning remains largely a local process.

3.2.1 City of Kent Approach

In the City of Kent, the Draft Comprehensive Plan follows a hands-off approach to the LOS problem and explicitly states its desire to avoid setting a standard.

"The City is proposing a desirable level of transit service; however it is not being treated as a standard....By adopting an LOS standard when the supply is provided by another agency, such as METRO or Washington State, the City either may be obligating itself to pay for additional service or may be required to deny development if such service is not in place." (City of Kent Draft Comprehensive Plan pg.9-12.)

The proposed approach to LOS for public transportation in Kent's Draft Comprehensive Plan is based on **frequency of service guidelines**, roughly based on existing service levels, associated with 22 transportation analysis zones. These frequencies of service range from 10 to 60 minutes during peak and off-peak periods for areas served by fixed routes. Dial-a-ride services are recommended for all rural areas. A zone is counted as having service if a transit route in some way touches a zone boundary or passes through it. The approach does not directly consider how inter-zonal travel demand corresponds with current public transportation activities. Rather, it assumes that current route structures that adjoin or pass through a zone must address the travel needs.

This approach to LOS is based on one of several possible indicators that generally relate to the "quantity of activity" provided or supply. The use of indicators reflecting supply are important for understanding LOS, but taken alone they result in an incomplete understanding about the value and need for the service. Furthermore, the use of such measures in isolation leave the evaluation of growth management outcomes outside of the assessment process.

The City of Kent's Draft Comprehensive Plan also identifies a number of public transportation needs and policy goals centered on the development of more localized

activities in addition to various improvements in regional services (Kent Draft Plan pp.9-19--9-33). Most of these policy goals are expected to come about as a result of Regional Transit Authority (RTA) development efforts; none of them attempt to define specific LOS standards.

3.2.1.1 Linkage to Financing and Treatment of Concurrency

The City of Kent Draft Plan does not yet provide a financial element for any of the transportation modes. Given their general approach to avoid identifying LOS standards for public transportation, it is unclear whether they intend to address financing of public transportation improvements, but it seems doubtful they will.

The approach in the City of Kent to the subject of standards suggests that they will not treat LOS for public transportation as a concurrency mechanism. There is no specific language in the Kent plan that discusses how future development activities will be evaluated in terms of their impact upon public transportation provision.

These observations do not imply that the City of Kent does not recognize significant public transportation needs (see page 9-17 in the Draft Plan), nor that they expect no impacts from development on these needs. Rather, because of the lack of control over transit provision and funding, they are deferring to METRO and future RTA transit developments to meet both the existing and future needs for public transportation.

3.2.1.2 Implications of Kent's Public Transportation LOS Approach

The outcomes of the City of Kent's public transportation LOS are difficult to assess given their position on standards. The Transportation Element of their Draft Environmental Impact Statement (DEIS) does, however, provide some additional insight about their expectations. The DEIS suggests that overall public transportation utilization will roughly double for all types of trips over the 20 year planning horizon (DEIS, p. 3-27). Specifically, homebased work-trips by transit are expected to increase from 6.8% in 1991 to approximately 15% in 2010, home-based other trips are expected to increase from 2% to 4%, and non-home-based other/commercial trips are expected to increase from 0.9% to approximately 1.8%.

This assumption on utilization of public transportation essentially represents a separate element of evaluation, but apparently because of the lack of control over service provision and funding, no explicit connection to these assumptions about utilization are made in the comprehensive plan. In sum, no standards are established, funding for public transportation is not considered, and yet they expect a doubling of non-SOV travel.

3.2.2 City of Bothell Approach

The City of Bothell's, Draft Comprehensive Plan follows a second approach to LOS standard development. In this plan the provision of service by METRO (and Community Transit for the Snohomish County part of the city) is noted, but it is not discussed as a constraining factor for the development of LOS standards as in the case of Kent. The proposed public transportation LOS definition at the City of Bothell is based on **transit service coverage**, or the percent of population with access distance of one-quarter mile to general transit service. The recommended LOS standards for this definition proposes to increase the existing LOS estimated at 10% of the population within the access distance to 50% of the population by the end of the 20 year planning horizon (City of Bothell Draft Comprehensive Plan, pg. TR-18).

3.2.2.1 Linkage to Financing and Treatment of Concurrency

As in the City of Kent case, Bothell's proposed public transportation LOS approach does not make any connection to funding nor does it discuss the use of these access criteria for concurrency purposes. Once again it appears that evaluation of the impacts of development on public transportation, or at least the expectations that public transportation services will be expanded, will be left to METRO and RTA.

3.2.2.2 Implications of Bothell's Public Transportation LOS Approach

The growth management implications of Bothell's approach to LOS based on an access-distance standard are at best uncertain. Since no connections are made to concurrency issues one conclusion is that the central purpose of their LOS definition and standards are to promote other growth management planning goals (i.e., reduce SOV travel, encourage efficient land uses etc.). The proposed increase of Bothell residents with access distance of 1/4 mile, from 10 to 50 percent, if achieved, presumably is meant to imply that these other goals will be satisfied. Will this be the case and what does this standard mean in terms of costs?

The application of access-distance LOS criteria, when taken alone as in this case, is based on the assumption **that greater coverage, or at least some greater percentage of population within access distance, results in greater use**. Without any linkage to other evaluation criteria such as response rates or non-SOV travel rates etc. there is no way to anticipate what this standard will accomplish nor what it means in terms of the expectations for public transportation service provision. It is conceivable that Bothell, or other towns using access-distance criteria, might achieve such LOS targets through increased development densities without changing the current structure, or amount, of public transportation. Such results would correspond well with the intents of GMA if

they were to occur. Unfortunately, it does not seem likely this will happen nor that this is the logic behind the Bothell approach.

Given the expectations of the City of Bothell travel model which forecasts an overall increase in transit usage from 0.7 percent in 1990 to 1.3 percent in 2013 the impact of this LOS approach will be a 0.5% change in transit usage after a 40 percent change in the number of people who have “access” to general transit services. Is this good transportation policy and will it in any way address the overall intent of growth management planning goals? It is difficult to imagine that a 0.5% change in public transportation utilization will accomplish much in this regard.

This example reveals how singular dimension evaluation criteria may be misleading when incorporated in LOS definitions and standards. In order to interpret what public transportation provision means as related to growth management it is necessary to consider how service provision correlates with service use and community-related planning goals that are based on service use. In the Bothell case, the proposed LOS definition does not do this and, as a result, it appears as though the expected outcomes from the proposed LOS standards are almost negligible.

3.2.3 City of Seattle Approach

The City of Seattle's Recommended Comprehensive Plan explicitly recognizes the constraints of not controlling transit provision as an issue in LOS criteria development, like the City of Kent, but does not reach the same conclusion in their proposed approach to the treatment of LOS.

"..the City's level of service standards must be within the City of Seattle's control. For example, the City does not control the number or routing of buses; however, it can manage travel time on the street through traffic operations." (Seattle Planning Department, 1994 p.58)

In response to these constraints, and the requirement of growth management to develop standards, the City of Seattle has adopted **transit travel time** on the transit priority network as the transit LOS standard. Transit travel time in this case refers to the scheduled amount of time to travel from one point to another along a given route. Current transit travel time will be measured and used to evaluate future conditions as growth occurs.

3.2.3.1 Linkage to Financing and Treatment of Concurrency

Evaluation and funding of transportation system improvements required to maintain the proposed LOS standard travel times is to be accomplished through the Transportation Improvement Process. A new concurrency mechanism is under

development to support this concern with maintaining the integrity of public transportation travel time as growth occurs in overall travel and as the city's arterials presumably become more congested. Thus, the City of Seattle approach appears to have met the minimum requirements of linking their standard to funding

In addition, the City of Seattle has proposed development of a new system of neighborhood based circulators and shuttles to supplement the existing inter-neighborhood and regional services provided by METRO. This system has been named LINC (Local Initiative For Neighborhood Circulation). Specific funding sources for these activities remain unidentified in the draft plan but possibilities mentioned include: "grant funds, Regional Transit Project System Plan local transit funding, contracts with Metropolitan King County and/or locally generated revenues" (City of Seattle Mayor's Guide, 1994 pg 54).

3.2.3.2 Implications of Seattle's Public Transportation LOS Approach

The City of Seattle approach to public transportation LOS definition emphasizes as its key concern the overall functioning of the transportation system related to transit vehicle mobility. This approach should help maintain, or improve, inter-neighborhood transit travel time and in so doing should help promote the convenience of transit use particularly if arterial congestion continues to grow.

The City of Seattle approach, however, leaves unexamined other important issues related to the amount of service, service distribution, the relative use of service, and the effectiveness of service for other community intents of growth management. An alternative approach to LOS definition and evaluation that considers all these additional issues may cause the City of Seattle, for example, to look at the development of the LINC system differently. In other words, if the City of Seattle had incorporated other evaluation criteria into their LOS framework and had applied them to existing METRO services within the city they may have found evidence that some restructuring of existing services may result in making funds available for implementation of LINC.

One further point related to LOS definitions in the city of Seattle context relates to how the LINC services themselves will be evaluated. The City's Draft Plan is not explicit on this matter but preliminary planning appears to be based on supplying a certain number of circulator vehicles per capita in neighborhoods. Such approaches are sufficient as a starting point for LOS definitions but other evaluation criteria will be necessary in order to understand issues such as the relative cost efficiency of public (i.e., METRO) vs. privately-contracted provision of the LINC services. The discussion in the first case study in this paper, for example, highlights why cost efficiency issues are so important in LOS discussions. Other evaluation criteria may also be necessary to make equity trade-offs related to differential service provision in neighborhoods based on other

criteria of need (i.e., a high percentage of transit dependent people) or demand (i.e., a low percentage of service utilization).

3.3 Interpretation In Relation To Elements of Evaluation

This section summarizes how/where the proposed approaches to LOS focus attention in the evaluation process. The discussion is organized around Table 3 which has the purpose, as in the previous case study, to summarize and highlight what the selected definitions and standards for LOS in the examples emphasize, and do not consider, in the evaluation process outlined in Figure 1. Question marks are used to highlight those elements that have not been explicitly emphasized in the planning process to the best of our knowledge.

The table is organized starting in Column 1 with the list of assessment elements presented in Figure 1. The second column summarizes the central types of questions related to LOS concerns typically associated with each of these elements under growth management. These questions are provided as a point of reference for the reader to assist in the interpretation of how LOS relates to the particular issues raised. The remaining columns present the issues, and perspectives, raised by each example. The table is designed to help portray how this defining of LOS criteria for public transportation in the context of growth management is currently valued by these different local jurisdictions.

As seen in the table and as discussed above, two of the examples (City of Kent and City of Bothell) are focused on **quantity of activity** (commonly referred to as supply measures) as the sole criteria for public transportation LOS. This exclusive emphasis on supply neglects consideration of other important elements of evaluation.

- First, an exclusive emphasis on supply measures does not consider the cost implications of proposed LOS standards as required by the GMA.
- Second, an exclusive focus of LOS definitions based on supply measures does not consider the actual demand, or lack thereof, for public transportation. This contrasts with the use of LOS for other categories of public facilities and services, such as roadways and sewers, where demand is directly considered as part of the evaluation and planning process. The failure to consider demand effectively precludes any tie to the concurrency intents of growth management where the purpose is to maintain service levels (supply) as growth or (demand) increases.
- Third, the exclusive focus on supply measures in these LOS definitions prevents direct consideration of transportation system and community outcomes related to the desire to increase non-SOV travel for a number of social, economic and environmental reasons commonly referenced as motivations for growth management.

For both of these cases unconstrained service provision represents the only criteria of evaluation. Unfortunately, **since there is no explicit connection with levels of provision and any other evaluation criteria, it is impossible to conclude whether or not the LOS definitions are appropriate for growth management purposes.** One possible result from these approaches, given the total lack of other assessment criteria, is that frequent and densely spaced service may be provided, but with little actual use by the public. The net result under such a scenario would be little impact on the functioning of the transportation system or other community growth management concerns. Second, since costs are not considered in either of these approaches it is difficult to ascertain (as also required under the financial elements of GMA) whether or not the LOS is achievable with current or future levels of financing.

The third example, (City of Seattle), primarily approaches LOS for public transportation from a focus on the functioning of the transportation system (transit travel time on the transit priority transportation network) with direct implications for quality of transit provision (i.e., convenience as measured through on-time performance). The City of Seattle intends to use this criterion as part of a concurrency mechanism and transportation improvement process. Although more explicit, the system functioning approach to LOS for concurrency purposes seen in the City of Seattle by design considers only a limited range of important assessment issues potentially relevant to growth management planning concerns and effective transportation policy. The deferral of service design, relative efficiency, utilization, effectiveness and outcome issues to METRO disconnects the intents of growth management from the primary government body responsible for facilitation and achievement of growth management goals.

The primary outcome from the City of Seattle's approach to LOS definition will be maintenance of on-time performance of routes along major arterials. This is undoubtedly important, but it obscures other issues that should also be integrated into growth management evaluation. A particularly important point in this case relates to the proposed development of the neighborhood-based circulator system. In order to successfully implement these ideas, particularly in an efficient manner, some service-provision and financial trade-offs with existing arterial-based services may be necessary or appropriate. Under the current LOS definition, which has been arrived at because of the structuring effects of institutional arrangements related to transit-provision control, these critical issues have been neglected and remain unexamined.

The question marks in Table 3 highlight for all of the examples what has, and has not, been considered in the development and application of LOS definitions. The abundance of these question marks strongly suggests that the results of the planning process related to the linkage of public transportation and growth management planning is at best weak. Most notably, Table 3 and the analysis of these three examples suggests that the definition of LOS for public transportation has failed to fully consider what

public transportation implies (Goals and Objectives) under growth management and what the outcomes of public transportation investment will likely be.

Table 3. Local Approaches To LOS Under Growth Management

Evaluation Element	LOS Questions Relevant To Growth Management	City of Kent	City of Bothell	City of Seattle
Goals and Objectives	What LOS measures relate to the goals and objectives of growth management?	?	?	?
Inputs	What is the amount of inputs necessary to provide the proposed level of service?	?	?	Linked to TIP with proposed concurrency mechanism under development
Activities	What are the types and amounts of access to services or facilities necessary to support community planning goals?	Frequency of Service for existing METRO routes are suggested to at a minimum stay the same. Policy statements suggest various improvements.	Service Density (based on access distance to service of 1/4 mile) will increase from 10% to 50% of population.	Does not address existing or future service levels provided by METRO. Proposes development of neighborhood circulators to meet unmet public transportation needs. Transit vehicle travel time LOS definition is associated with on-time performance and transit convenience.
Efficiency	How does the efficiency of service provision affect the LOS that can be provided?	?	?	?

Response To Activities	How much use is made of the activities? Do the current and future amounts of use support community planning goals? How does/will the use compare to alternative activities strategies to meet planning goals?	Draft EIS expects doubling of transit use by 2010.	Travel forecast predict an overall doubling in transit use.	?
Effectiveness	How effective is the LOS provided based on the response and inputs used (e.g., how many users per hour or trip segment; what cost per user)?	?	?	?
Transportation System Outcomes	What effect does the current LOS have on the transportation system? What effect would other LOS have?			Transit Travel Time on Transit Priority Network Is Primary LOS Criteria.
Community Outcomes	What effect does the current LOS have on other community concerns (e.g., land-use patterns)? What effect would other LOS or other transportation policies have?	?	?	?
Goal Attainment	How well are the goals addressed with the current LOS(i.e., what results are achieved for the amount invested)? How well would they be addressed for alternative LOS or alternative transportation strategies?	?	?	?

3.4 Discussion

How should the developments discussed in this case study of public transportation LOS under growth management be interpreted? To what extent do the proposed approaches to public transportation LOS definition fully address either the concurrency concerns of GMA or the other community planning goals that are significantly linked to the successful provision and utilization of public transportation activities? The conclusion of this analysis is that the approaches as specified will not fully achieve growth management or other community goals. Despite the range of alternative LOS concepts offered in the GMA planning guidelines noted in the introduction to this section, the selected approaches used by the cities in this report are incomplete. If public transportation is a key element for the success of growth management, it does not come through in these LOS examples as currently defined at the local level.

Above all else, this case study suggests that the current centralized institutional arrangement of public transportation provision in King County may be fundamentally at odds with growth management planning and community goals to reduce dependence on single occupant vehicles. With no control over service provision, or funding, there appears to be little that cities can currently do to control the integration of land-use and public transportation plans. Among the examples discussed it appears that the City of Seattle is being the most aggressive municipality by suggesting development of local neighborhood shuttles with, or without, METRO's help. Kent and Bothell, on the other hand, while recognizing a greater need for public transportation development are waiting for METRO and the RTA to make additional service available. None of the cities have fully considered how the important linkage to public transportation finance, currently controlled by METRO, may in the end represent a significant barrier to making the public transportation improvements necessary to realize their growth management visions.

Ulberg (1990, p.22) in a project for the Transportation Research Board examined the issues surrounding the regional vs. local provision of bus service and among other observations noted the difficulty in separate transit provision and land-use control.

"it is more likely that locally provided service will be responsive to local land-use desires than would service provided by a regional operator. To the extent that other land-use controls such as zoning, land purchase, and other parts of the transportation system, are under the control of the local jurisdiction, controlling the transit service would enhance its ability to manage land use."

What are the implications of these observations for King County and elsewhere in Washington State where transit provision is primarily controlled by county-wide agencies? Should regional providers be disbanded and replaced by new systems in every city? Probably not. However, if public transportation provision is to become a more integral part of many communities' land-use/transportation-planning frameworks, and if it is to be treated more

flexibly as part of the concurrency process, it appears that some minor adjustments may be in order.

ALT-Trans, a coalition of community groups interested in transportation issues, is circulating a proposal suggesting a legal change in public transportation finance that would put one-third of the public transportation funds collected through the sales tax increment back in the control of local jurisdictions. These funds would allow communities to develop their own shuttle services (perhaps fare-free shuttles), for example, or other public transportation programs as they saw fit to meet community planning goals. They could decide to contract the service with METRO, but it would be their prerogative to select some other contractor if they felt they could get more service for their money. Local control of funds may also in cases point toward improving a sidewalk or some other activity supportive of public transportation policies to reduce the number of SOV trips in a community. The important point is that given some flexibility, and control, communities could more fully explore the most effective and efficient options for meeting community goals. In the current environment there is little incentive, and no control over service design or financing, to do so. Potentially, impact fees might serve this purpose but this is not suggested in any of these cases nor in other contexts in Washington State to our knowledge. Furthermore, given the fact that METRO currently appears to be providing excess capacity throughout much its system (see Working Paper 2.0) restructuring of current activities might result in enough savings to avoid unnecessary impact fees on development which in turn might help keep the prices down for affordable housing in urban centers.

The examples in this case study, and the discussion of changes in control over public transportation provision and evaluation, strongly suggest that a reconsideration of LOS approaches is necessary for the successful integration of public transportation into local growth management plans. This conclusion further supports the observation that LOS definition and standards must be approached broadly and flexibly in terms of the assessment elements in Figure 1 starting with community goals. At a minimum, and for the concurrency purposes of GMA, it is necessary to consider not only singular dimensions of how much service is provided (e.g., Kent and Bothell) or the travel time of buses on arterials (e.g., Seattle) but also whether or not anyone is using the service and how much the service costs.

The other purposes for public transportation under growth management suggest that additional evaluation dimensions need to be considered as part of the LOS definition and standard-making process. If, for example, one of the primary community goals is to change travel mode-split, then the design of activities, expenditure of funds, and their evaluation of effectiveness should be measured against some outcome such as mode-split or overall vehicle-miles-traveled (VMT). It is interesting that even King County's Growth Management LOS Policy Framework, signed and approved by the Growth Management Planning Council, strongly suggests the use of such measures in a multi-modal approach to LOS but none of the examples in this case study have followed these recommendations. A consideration of such issues would for example raise questions about the expected outcomes in the City of Bothell where the expectations are for a 0.5% change in public transportation utilization.

If the goal of growth management planning is to encourage densification in certain areas, then perhaps local public transportation funds should be targeted at coordinated design and financial incentives for desirable housing with a high-level of public transportation service both local and regional in extent. There are undoubtedly a range of creative possibilities to be explored but they will not occur if the planning process in communities continue to focus on a very limited definition of LOS rather than a LOS assessment framework. **The WSDOT should take an active leadership role in helping local communities, and legislators, embrace a more comprehensive approach to LOS definitions and a critical evaluation of current public transportation institutional barriers.**

The study of these three examples has revealed a number of issues associated with the definition of public transportation LOS within the context of growth management. Three of these issues stand out and seem to be largely explained by a fourth.

First, how do the goals expressed in the proposed definitions relate to the goals of growth management?

This case study began by characterizing the public transportation component of growth management as concerned first with concurrency and, second, with other community planning visions. The concern of the former is for concurrent development of public-facility/service supply to meet growth demands; the latter with issues such as facilitating different land-use patterns, personal mobility, reduced auto travel and associated problems.

The analysis in this paper has revealed that two local approaches to defining LOS for public transportation, Kent and Bothell, do not deal directly with the goal of concurrency. The City of Seattle's definition of LOS, based on transit travel time over the city's arterial network, is linked to a concurrency mechanism that is under development.

It has been especially revealing to note how few connections have been made with other growth management community planning goals. The cities of Bothell and Kent have chosen to focus their LOS approaches on guidelines or targets related to public transportation supply using frequency of service and access distance criteria. Theoretically, for the case of Bothell, the use of access-distance criteria could be related to some community planning goal such as making service more widely available as the community grows or more generally for the purposes of enhanced personal mobility. However, it is not clear in the definition nor in the overall expected utilization of public transportation exactly what goals are being addressed. In the Kent case the connection to community goals is equally uncertain because of their total disassociation from setting any LOS standards. One interpretation of the proposed LOS approaches in these two cases is that they were developed by extracting pieces of METRO's LOS guidelines distributed to all cities in King County. METRO's LOS standards are based on the combined use of frequency and access-distance for different types of population and employment density contexts which taken together provide a geographic accessibility LOS definition. The analysis in

Working Paper 2.0 illustrated the advantages of geographic accessibility criteria as a starting point for public transportation LOS definitions. That analysis also pointed out the inherent problems of adopting piecemeal the components of geographic accessibility criteria. Whereas a full consideration of frequency of service, population and employment densities (the presumed need for public transportation) and access-distance provides a good starting point for service design, uniform access-distance and frequency of service criteria used in isolation of each other and the context of application can result in inefficient and ineffective service provision.

The Seattle LOS definition is well connected to the community planning goal of maintaining the integrity of transit travel time as travel congestion on arterials increases with growth. However, the Seattle definition, as well as those in Kent and Bothell, all avoid any systematic connection with other important visions in their comprehensive plans and the recommendations given to them for defining LOS by the Growth Management Planning Council (GMPC). Among these additional issues that can be broadly correlated with the community planning intents of growth management, two particular GMPC guidelines stand out. First, these guidelines emphasize that non-SOV mode-split goals should be established at the local level and that these goals should be coordinated to achieve county and regional goals. Second, the guidelines recommend that demand-side transit performance measures be adopted in order to achieve the mode-split goals. The approaches examined in this case study have not emphasized these recommended guidelines as part of their LOS frameworks.

In sum, the connections between LOS definitions and the two major categories of goals for public transportation under growth management are for the most part tenuous. First, we would expect to see more in terms of the treatment of concurrency for public transportation than we have. Second, although we would expect variation in approaches and emphasis as a result of different community settings, we would expect to see a more developed treatment of LOS definitions related to community planning goals. For these three cases, at a minimum we might expect to see an overall emphasis on the concept of geographic accessibility, following after METRO's guidelines, with perhaps a differential emphasis on the dimensions of accessibility. So, for example, Bothell and Kent, as rapidly growing suburban centers might be most concerned with access-distance to public transportation constrained by threshold population densities for making trade-offs between fixed-route and demand-response services. In the Seattle case, we might expect to see a greater concern with frequency of service, and the relative connectedness of various centers (e.g., Capitol Hill and Seattle Center/Queen Anne an on-going concern to local residents in these areas) rather than access distance per se and in addition to transit travel time. While there may be an underlying logic that supports a general starting point for LOS definitions, ultimately it is the community, and its context, that should define its goals and the LOS definition accepted should relate directly to those goals. The issues that logically emerge from a consideration of planning goals under growth management are not fully addressed explicitly (or implicitly) in the proposed LOS approaches.

Second, how do the LOS definitions connect to the inputs required to produce and sustain them?

As noted earlier, concurrency is the major element of GMA driving the requirement for defining LOS standards. To achieve concurrency, local authorities need to anticipate demand and to ensure that there is sufficient transportation capacity (highway as well as public transportation) to meet that demand. The requirement of supply/demand balance in concurrency strongly suggests that *both* of these elements should be internalized in LOS definitions and standards. One possible approach that combines these two factors is *the utilization rate*. Low utilization rates would signal excess capacity whereas high utilization rates would signal the need to consider investing additional resources in public transportation services.

Many jurisdictions may prefer not to internalize the need to balance supply and demand considerations such as modeled in METRO's LOS guidelines where geographic accessibility is defined without consideration of actual travel patterns or utilization of services. In such cases, it is imperative that the planning process in which LOS standards are defined, operationalized, and used for allocating resources, explicitly identify the costs of moving from one level of service to another within a given context. Level of service criteria may provide desirable service levels, but those criteria may not be easily applied or be affordable in some contexts.

Communities should be able to anticipate how much various levels of service will cost (which may cause them to reconsider their criteria) and should be able to identify who will pay for it and how they will pay for it. Consider the example of Bothell once again. While their criterion of access to transit routes may be reasonable for parts of their community, it is normally not reasonable in areas with less than eight housing units per acre. A demand responsive system would probably be much more cost effective and would also likely offer superior service. Given the unevenness of how much it would cost to provide different kinds of service relative to the state of development of a community, LOS standards should be selected that are flexible in accommodating different contexts and changing contexts.

For all of the examples, this analysis has revealed the preference to avoid internalization of supply and demand considerations, defined from a utilization perspective, and as related to costs. That is, none of the approaches directly considers supply of public transportation activity, demand (i.e., use) and cost of provision together. The City of Seattle has externalized the consideration of cost inputs by linking their definition to the mobility of transit vehicles in relation to automobiles and by connecting their evaluation of cost trade-offs to the TIP process. Presumably this linkage to the TIP process will result in favorable treatment of arterial modifications to support transit use over time. This approach does not deal directly with the actual use of public transportation, nor its finance, in focusing solely on the functioning of the arterial transportation system. As mentioned throughout the paper, the Bothell and Kent approaches do not deal with demand or costs in any form.

The main question resulting from this analysis is whether or not these definitions reflect actual community preferences not to consider supply, demand and costs or, alternatively, are these results a reflection of other factors in the definition process? The discussion below concludes it

is the latter and that a different pattern of LOS definitions would have resulted from an unconstrained institutional environment.

Third, communities need to consider how their LOS definitions and criteria relate to outcomes, both for the transportation system and for the community.

Both the Kent plan (frequency) and the Bothell plan (distance) feature *levels of activity* as the form of their LOS definition. In neither case is there any attempt to justify levels of activity in terms of what they are likely to achieve either from a utilization perspective, as discussed above, or from a broader outcome perspective. Indeed, the Bothell plan anticipates little increase in transit use, for a greatly expanded level of activity. The intent of GMA is to ensure that local communities manage growth effectively. If an LOS definition leads to a provision of service that is ineffective, then resources will have been wasted and growth will not be managed effectively. Thus, if a community decides to hold utilization (or demand) for public transportation and its outcomes external to their LOS definition, these issues should be considered elsewhere in the planning process.

Seattle's focus on transit travel time partially attempts to account for outcomes. This public transportation LOS definition comes closest to the classic highway LOS in its concern with transit vehicle delay or mobility. Although it does not directly measure crowding within the transit system, or volume-capacity another major component of traditional highway LOS, it does measure the extent to which public transportation, in a built up area, is able to function effectively. If transit speeds fall, it might be assumed that the level of service has deteriorated and that more resources are justified in order to bring the level of service back to some minimum levels. In this sense, the use of mode split, as suggested by the GMPC in King County, might well serve as a surrogate measure for outcomes associated with many different types of community goals (such as reducing air pollution) and transportation goals (reducing congestion). The use of LOS measures like mode split and transit time, however, are subject to many other influences that necessitates their careful and flexible application in different contexts.

Fourth, it appears that the local development of LOS definitions has been seriously constrained by the institutional separation of land use planning and transit provision.

The case studies have clearly revealed the disjuncture between the level of government responsible for providing public transportation and the level of government responsible for managing growth. The seriousness of this disjuncture is most dramatic in the Kent Plan, but it is inescapably a part of every jurisdiction's constraints and can be seen in the Bothell and Seattle plans in this analysis. It appears that the LOS definitions that have emerged in all of these contexts are as much in direct response to the separate guidelines mailed to local jurisdictions by METRO in October of 1993 as they are in response to any GMA, GMPC, or community planning goals. These guidelines include the direct statements that rest at the heart of the Kent and Seattle approaches. First, METRO stressed that its (Metro's) service guidelines should not be adopted by jurisdictions as a level-of-service standard because local jurisdictions do not have

authority to operate transit. This statement is directly reflected in the Kent Plan as quoted earlier in this document. Second, METRO suggested that "transit levels of service standards adopted by local jurisdictions should only focus on facilities they manage." Hence, the City of Seattle decision to use transit vehicle travel time over their arterials as their LOS definition and their decision to identify the LINC system for future development with, or without, METRO's involvement. The City of Bothell case adheres less directly to any specific METRO recommendations but, as noted above, their adopted criteria does reflect one of the variables seen in METRO's LOS definition.

An additional statement made by METRO highlights another element of evaluation affecting the definition of LOS and the implementation of standards in terms of the disjuncture between local planning frameworks, and control over transit provision. METRO has emphasized in its LOS guidelines that equity considerations may affect the prioritization of service allocation and delivery. In other words, cities cannot presume that services will be provided even when the conditions suggest they are warranted because other needs for service in the county may be more important at any given time. Thus, yet another dimension of evaluation enters the equation for LOS definition and standards, and taken with all of the other constraints, leaves communities trying to plan for growth in a very difficult position. On one hand they have no authority to operate transit and on the other hand they have no guarantee that service will be provided to qualifying areas because of METRO's broader regional concerns.

In addition to all of the complications that this institutional disjuncture has created for the growth management planning process, this situation compounds the difficulty of bringing public transportation more completely into juxtaposition with roadway LOS definitions. Unlike the confusing and limited LOS definitions for public transportation seen in these examples, the LOS definitions for roadways remain quite focused and systematically evaluated based primarily on traditional measures of volume-to-capacity and travel delay. Thus, the current institutional arrangement governing public transportation provision exacerbates the challenges faced by community planners who are trying to implement a new vision for communities less dominated by the automobile. Public transportation in Bothell and Kent, and to a degree in Seattle, will likely have a more difficult time fulfilling these expectations and competing for transportation funds given the proposed LOS frameworks.

4.0 Case III: Regional Mobility, Congestion, Air Quality and LOS Definition

This case study examines the development and application of LOS definitions when the goal of a transportation project or policy is to mitigate congestion and air quality problems. Evaluation of these closely related goals implies the need for a LOS framework that is multi-modal in character. The expectations and points of emphasis in such evaluation environments also generally require a shift in conceptual emphasis for the LOS term. The central focus of the use of the LOS concept in multi-modal evaluation contexts is on the later elements in our overview conceptual framework (Figure 1), those related to the functioning of the transportation system and community-related outcomes, especially those related to highway congestion and highway-generated air pollution. These concerns suggest that in a multi-modal evaluation

context traditional roadway LOS concepts are of greater relative importance than other indicators of public transportation LOS. The definition and application of the LOS concept in multi-modal contexts is secondarily concerned with the character and level of particular public transportation activities, or policies, and the response they induce. The primary emphasis on public transportation is as a means to improve highway LOS. In this sense, traditional public transportation activities are treated as a tool, or a Transportation Control Measure (TCM) as defined in the Clean Air Act (CAA), designed to reduce SOV-Trips or VMT that in turn hopefully reduces congestion and automobile emissions.

The analysis in this example explores the relationships between the various elements of evaluation in Figure 1, the development of LOS frameworks under the mandates of ISTEA and the CAA, and our overall understanding of what the concept of LOS implies in multi-modal contexts. The proposed commuter rail development in the Everett-to-Seattle (North) corridor serves as the working example for the analysis. The discussion begins with an overview of ISTEA and Clean Air Act mandates that underlie the multi-modal application of LOS for congestion management and air quality purposes. Second, the proposed commuter rail service is described and the evaluation of the proposal, to date, is outlined in relation to elements of evaluation in our framework (Figure 1). This analysis reveals a singular focus in the evaluation process that is limited to activity cost effectiveness of the proposed transit activity in isolation. The third section explores the additional perspectives of LOS evaluation important in any multi-modal evaluation context applicable to the concerns of ISTEA and the CAA. The final section discusses the findings in relation to WSDOT's desire to develop an evaluation framework for public transportation and for the general implications related to understanding LOS definition and application.

4.1 Background Related to the LOS Implications of the Clean Air Act and ISTEA

A major focus of ISTEA, and of primary concern in this example, is the requirement for development of a Congestion Management System (CMS) as part of the metropolitan planning process. State department's of transportation have overall responsibility for the CMS but the actual development of these systems is accomplished in coordination with regional Metropolitan Planning Organizations. The CMS under ISTEA is meant to serve two purposes. First, the CMS is to provide the evaluation framework for determining if new highway developments will impact congestion (i.e., will projects affect mobility and the operational efficiency of the highway system). Second, ISTEA created a new funding program referred to as "Congestion Mitigation and Air Quality" (CMAQ) for projects designed with congestion and air quality benefits as major goals.

Denno (1994) points out that it is really only the CMAQ provisions of ISTEA that are a significant departure from past funding practices and cross-modal funding possibilities. Despite the considerable rhetoric surrounding ISTEA as a revolution in transportation funding that should "level the playing field" between automobile roadway projects and other modes, Denno details how most of the opportunities for funding non-traditional projects existed under previous

programs and funding rules. The creation of CMAQ combined with requirements of ISTEA to develop a CMS clearly focus the evaluation dimension of ISTEA on the functioning of the highway system and the effectiveness of various strategies to reduce congestion and emissions.

The closely associated goals of the transportation component of the Clean Air Act (CAA) centers on the stabilization and reduction of mobile-source emissions. The Puget Sound Region is currently in non-attainment for carbon monoxide (CO) at the high-moderate level and is marginal for ozone. Under these conditions, the CAA requires conformity with the State Implementation Plan (SIP) for emission stabilization from mobile sources. The evaluation emphasis in the SIP is concerned with two dimensions of evaluation. The SIP requires an analysis that demonstrates regional transportation projects and plans will not result in increased vehicle-miles-traveled (VMT) and, if actual VMT is found to exceed conformity projections by 5% or more, then additional transportation control measures become necessary.

Among the control measures specified in the CAA are a number that directly, and indirectly, relate to public transportation services. For example, the first TCM listed in Section 108(f)1 of CAA is "programs for improved public transit." Table 1 provides a complete listing of the approved TCM's organized to highlight their emphasis on transportation demand management (TDM) and transportation system management (TSM) strategies. For the purposes of this paper it is important to note that many of the TCM's listed (e.g., programs for improved public transit, trip reduction ordinances etc.) primarily relate to the "activities provided" dimension of our evaluation framework in suggesting various types of programs and policies that presumably will improve air quality. This expectation of improvement, in turn, points to other dimensions of evaluation related to the overall functioning of the transportation system, the community related outcomes and the overall effectiveness of a given program or policy.

Table 1. Clean Air Act TCM's

TCM Type	CAA 108(f)(1) Transportation Control Measures
Public Transportation	1. Programs for improved public transit.
TDM, Public Transportation	14. Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events and other centers of vehicle activity.
TDM, General	3. Employer-based transportation management plans, including incentives.
	4. Trip Reduction ordinances.
	7. Programs for the provision of all forms of high-occupancy, shared-ride services.
	13. Employer-sponsored programs to permit flexible work schedules.

TSM, Public Transportation	2. Restrictions of certain roads or lanes to, or construction of such roads or lanes, for use by passenger buses or high occupancy vehicles.
	6. Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service.
TSM, Bike and Pedestrian	10. Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas.
	9. Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place. 15. Programs for new construction and major reconstruction of paths, tracks, or areas solely for use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest.
TSM, General	5. Traffic flow improvement programs that achieve emission reductions.
	7. Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during peak periods.
	11. Programs to control extended idling of vehicles.
	12. Programs to reduce motor vehicle emissions consistent with Title II, which are caused by extreme cold start conditions (not eligible for CM/AQ funds under ISTEA).
	16. Programs to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 light duty trucks. (not eligible for CM/AQ funds under ISTEA).

Taken together the implications of congestion management and clean air for development of LOS evaluation frameworks point, first, toward the use of indicators such as volume-to-capacity (V/C), VMT, and VMT weighted V/C which all attempt to characterize the functioning of the highway transportation system. These types of indicators have, for example, been adopted at the Southwestern Regional Transportation Council in Clark County, Washington as the central part of their proposed Congestion Management System. Second, the evaluation of TCMs designed to reduce SOV automobile travel demand which causes congestion and excessive emissions points toward an emphasis on other outcomes, and outcome effectiveness, criteria. Since estimates of effectiveness are derived from a combination of indicators, TCM evaluation also requires the use of indicators related to the other elements of evaluation in our evaluation framework (Figure 1). This includes information about the inputs, the type of activity or program, and the response to the activities. Ultimately, in order to understand the value of particular projects or policies under ISTEA and Clean Air, all elements of evaluation are required. It is the initial starting point and the interactions between multi-modal, or multi-policy, evaluation that differs significantly from other applications of these evaluation concepts and in turn complicates this type of assessment.

In sum, the various points of evaluation and LOS emphasis under ISTEA and the CAA are as follows. First, the congestion management implications of ISTEA are directly linked to how the highway system is functioning in terms of V/C and overall operational efficiency. This emphasis on the traditional domain of highway planning depends on the traditional definition of LOS as applied to roadways. Second, the CMAQ provisions of ISTEA, which provide a

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dedicated source of funding for transportation projects with congestion management and air quality goals, can be linked to other evaluation dimensions. As a project driven process, CMAQ evaluation points first toward a description of the type and amount of the project or activity to be provided. Second, CMAQ evaluation, we presume, is concerned with the outcome of a project or activity investment on the transportation system and air quality². The evaluation of the CAA similarly emphasizes the activity and outcome dimension in terms of TCM's; however, the outcome effectiveness dimension is ultimately of interest as different strategies for air quality mitigation are considered and compared.

The dual mandates of ISTEA and the CAA reveal a treatment of the LOS concept related to public transportation that de-emphasizes the relative "levels", or specific operation characteristics, of particular public transportation activities. Rather, the focus of the evaluation process is grounded in a concern for the relationship between "types of activities" and policies and their effect on the transportation system and other transportation-related community outcomes. This invocation of the LOS concept quite explicitly emphasizes the relative ability of public transportation activity or policy to relieve the effects of congestion on the transportation system, and the production of air pollution. This treatment of LOS in a multi-modal context, despite the rhetoric otherwise, is not so much about "leveling" the playing field between roadways and public transportation as it is about trying to comprehensively evaluate alternative strategies, including but not limited to public transportation, for keeping highways moving while mitigating certain ill-effects from current automobile technology.

4.2 The Proposed North Commuter Rail Project and its Evaluation To Date

Commuter rail between Everett and Seattle has been proposed as one part of a larger regional rail development project in the Puget Sound Region by the Regional Transit Authority (RTA). The context for this commuter rail proposal is a highly congested roadway travel corridor. Commuter rail transit is, in part, being studied as a way to impact highway LOS. Among the specific benefits attributed to the project are its potential for enhancing mobility by providing a travel alternative during peak-period congestion on the major north-south arterials I-5 and SR-99 and the expectation for reduced energy consumption and air pollution.

The commuter rail project has not specifically been developed in response to the congestion management requirements of ISTEA nor as part of CAA conformity. However, since much of the benefit associated with this proposed transit development is associated with these issues it serves as a good example for discussing how the evaluation process, including the definition and use of LOS, under these mandates may be structured and what the State's role can be in the evaluation of projects that have regional multi-modal implications. The State has a

²The list of transit-related projects funded at the Federal level using CMAQ funds in FY 1992 primarily included transit vehicle purchases and transit station improvements. An explicit linkage to outcome effectiveness for these investments is not mentioned (USDOT, 1993).
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clear interest in this project because of its role in providing initial funds for evaluating the potential development of the service and because of their financial commitment for part of the \$142 million capital costs³.

Table 2 outlines the basic operating assumptions and evaluation elements used in the feasibility study for the proposed service. The first column lists the elements of evaluation corresponding with our evaluation framework (Figure 1) and the second column highlights specific information relative to the evaluation of the proposal. Most importantly, Table 2 highlights the evaluation emphasis in the feasibility study on the **cost effectiveness of the activity** as called for in the State Legislation that initiated consideration of the service. Section 24 of the Revised Code of Washington (RCW) Section 81.104.120, states:

"Transit agencies and regional transit authorities may operate or contract for commuter rail service where it is deemed to be a reasonable alternative transit mode. A reasonable alternative is one whose passenger costs per mile, including costs of trackage, equipment, maintenance, operations and administration are equal to or less than comparable bus, entrained bus, trolley bus or personal rapid transit systems."

The conclusion of the original feasibility study was that commuter rail would be a "cost effective" alternative at \$0.37 per passenger mile compared to enhanced express bus at \$0.40 per passenger mile. These numbers were derived by combining the annualized capital costs (\$6.1 million) and the annual operating and maintenance costs (\$5.6 million) and then dividing by an estimate of passenger miles. The latter figure being the product of daily riders (4,600) and average trip lengths (27.5 miles).

The recent increased estimate of capital costs to \$142 million based primarily on higher station costs, higher right-of-way costs, and higher vehicle costs suggests that some reassessment of cost effectiveness is necessary to meet the reasonableness criteria defined by the state. Under this new capital cost estimate it appears that the cost per passenger mile may now be approximately \$0.51 per passenger mile assuming an annualized capital cost of \$11.5 million. This number increases further if the daily ridership assumptions included in the RTA's Phase I Study Options Results Report, dated September 9th, 1994, are used. This report suggests only 3000 riders per day (or 21.5 million annual passenger miles) will use the service at a cost per passenger mile of \$0.80. There is a State role and interest in clarifying these cost effectiveness issues based on the initial enabling legislation that specifies cost per passenger mile as the single criteria of evaluation for reasonableness.

The primary point of this case study, however, is to highlight how the evaluation approach used to date in the commuter rail example has overlooked other dimensions of assessment important for any project with multi-modal LOS implications. An evaluation process embedded within a multi-modal approach to LOS would, in addition to activity cost

³RTA estimate (in 1995 dollars) dated September 16th, 1994. Feasibility study estimate (in 1993 dollars) dated March 30th 1994 totaled \$75 million.
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effectiveness, include a concern with transportation system outcomes, community outcomes and the overall effectiveness of the proposed activity for addressing its multi-modal and community goals. These other dimensions of evaluation and the expected outcomes of the proposed investment in this service have been overlooked even though we would expect under ISTEA and the Clean Air Act that these other issues would be a central part of the assessment process. The following section explores the additional perspectives of LOS evaluation important in any multi-modal evaluation context applicable to the concerns of ISTEA and the CAA.

Table 2. State Mandated Evaluation of Proposed North Corridor Commuter Rail

Evaluation Element	Commuter Rail
Goals and Objectives	Provide transit alternative and connections to multi-modal terminals. Reduce energy consumption and air pollution.
Inputs	Capital Improvements \$75 or \$142 million Annual Operating Costs = \$5,569,000 Daily Operating Costs (5-days/week) = \$21,419
Activities	12 trips per day (30 min headway during morning and afternoon peak periods) Daily Vehicle Hours = 6 Travel Time = 56 min.
Efficiency	Daily Operating Cost/ Vehicle Hours = \$1,561 Daily Operating Cost/Vehicle Miles = \$130
Response To Activities	Passengers Per Day = 4,600 (1994 Feasibility Study) (Passengers Per Day = 3,000 1994 Phase I Study Options Results Report. Calculations in this table based on 1993 estimate)
Effectiveness: Activity Cost	Passenger Trips/ Vehicle Hour = 750 (Feasibility Study) Operating Cost/ Passenger = \$4.77 Operating Cost/Passenger Mile = \$0.17 Total Cost/Passenger Mile = \$0.37, or \$0.51, or \$0.80?????
Transportation System Outcomes	?
Community Outcomes	?
Outcome Effectiveness and Goal Attainment	?

4.3 Commuter Rail Evaluation Expectations Under ISTEA and CAA

As noted above, the multi-modal evaluation expectations of ISTEA and CAA, and the application of the LOS term to multi-modal evaluation contexts, focus on the categories at the bottom of our evaluation framework (Figure 1) beyond the level of a particular project or policy's cost effectiveness. Specifically, the congestion management focus of ISTEA is concerned with the relative response to alternative transportation modes and effects on the functioning of the transportation system while the CAA is concerned with the effect on mobile source emissions. This section will examine the implications of the proposed North Corridor Rail Commuter Rail Program for each of these dimensions.

4.3.1 Commuter Rail Evaluation Expectations For Congestion Management

From a congestion management perspective, LOS emphasis and the purpose of evaluation primarily relates to developing understanding about how SOV auto trips can be avoided and how this affects the overall vehicle stream and the capacity of the highway system. As noted in the introductory section this clearly involves the traditional application of the LOS concept applied to roadways using volume-to-capacity criteria. However, the emphasis of ISTEA on congestion management and related air quality issues also adds an explicit concern for the number of trips reduced by a given project or policy and the relative effectiveness of a given approach in achieving this outcome. Thus, in general we observe an expansion of the LOS concept in this multi-modal environment beyond its original definition and application for roadway construction. It is in effect partially a surrogate for air pollution as well as a direct measure of congestion.

An evaluation of the LOS implications of the commuter rail project thus requires a consideration of the extent to which the volume-to-capacity ratio of the highway corridor will change and how this change relates to the overall goal of reduced/stabilized corridor congestion. To simplify the discussion we assume that the highway facilities are operating at, or above, capacity during the peak-period commutes on most days. Thus, the primary question is: What impact will the proposed commuter rail activity have on the level of peak period vehicle trips and, by association, congestion and air pollution in the North Corridor?

In this case we have an estimate of daily trips on the rail system (approximately 4000 total or 2000 each way) which we will assume are primarily new transit trips in the North Corridor to Downtown Seattle. To put this number in perspective, in 1990 PSRC estimates there were a total of 12,000 daily transit trips crossing a screenline at 185th just south of the Snohomish County Line (Final Environmental Impact Statement Regional Transit System Plan, March 1993).

The total daily vehicle trips estimated at the same screenline for 1990 were 279,700. Assuming that approximately 25% of these trips were peak-period work trips, and 40% were made during the peak period in general, the subtotals for each would equal 69,925 and 111,800 trips respectively. Therefore, the impact from the commuter rail service on overall vehicle

volumes in the corridor during peak periods would be approximately 3.5% (4000/111,800). This assumes that all of 4000 daily trips would be new transit trips rather than a shift from existing bus services.

This analysis provides a rough estimate of potential outcomes on the transportation system. Greater detail of travel conditions in the corridor in terms of volume-to-capacity and VMT weighted V/C could be examined in terms of the specific implications for highway LOS but they are beyond the scope of this project. In general the results would probably reveal similar conclusions about the relatively modest expectations of impact from the proposed service on overall vehicle volumes. Furthermore, since PSRC expects overall travel growth (measured in terms of VMT) in the corridor to increase by approximately 25% by the year 2020 it seems certain that the modest vehicle reduction from the commuter rail will quickly be offset by general travel growth.

From the broadened concerns of a multi-modal LOS evaluation framework focused on the congestion management, the question that emerges from these observations is how cost effective are the outcomes on the commuter rail proposal compared to alternative vehicle reduction strategies? In other words, what is the investment per percentage reduction in travel volume or vehicle removed from the highway system? From the above analysis we can assume that the annualized capital cost is somewhere in the range of \$6.1 million to \$11.5 million and the annual operating and maintenance costs will be approximately \$5.7 million. Thus, based on the above assumption of a 3.5% reduction in overall number of vehicles in the corridor the net cost is approximately \$3.4 million to \$4.9 million per percentage reduction in travel volume per year. On an annual basis the cost to divert one vehicle out of the traffic stream (assuming 4000 riders per day) would be \$3000 to \$4300.

What do these amounts mean and are they reasonable for the results achieved? Ultimately, these are the questions that must be evaluated from a decision making perspective and they directly influence the interpretation of any multi-modal LOS evaluation context. From a policy perspective the question that remains is whether or not alternative policies, programs, or services might achieve better results? This all implies that the development of understanding about what LOS means in a multi-modal evaluation context is inextricably linked to the outcomes on the transportation system and the effectiveness of a given program in attaining some level of outcome. The definition and application of LOS in a traditional roadway analysis does not normally invoke these additional concerns. Furthermore, public transportation in the multi-modal LOS context is clearly a tool designed to impact highway LOS.

4.3.2 Evaluation of Commuter Rail as a TCM under Clean Air

The development and application of multi-modal LOS definitions in response to the mandates of the Clean Air Act, as mentioned above, also involves a focus on outcomes and effectiveness issues. In this case, however, the outcome dimension relates directly to automobile

emissions which only in part, result from roadway congestion and the amount of automobile travel. This partial relationship between transportation-related emission levels, congestion, and overall travel volume, as more fully described below, complicates the interpretation and application of LOS. The application and interpretation of the LOS concept applied to multi-modal transportation evaluation for air quality purposes may best be characterized as a type of alternatives analysis where different transportation control measures are examined for their relative outcomes and effectiveness for reducing emissions.

The central purpose of air-quality motivated transportation evaluation is to estimate the net emissions reduction from one or more activities, policies, or programs where the end-product of analysis is some cost per ton of avoided pollution. The complications that arise in this type of analysis applied to transportation emission sources are however quite extensive (see Harvey and Deakin, 1992). First, assumptions must be made about the emission rates of the vehicles that are taken out of the travel stream because all vehicles do not emit at the same rates for various reasons including age, installed technology, and maintenance condition. Second, emission rates are dependent upon the operating conditions on the roadway and individual driving styles. Some emissions are higher during congested conditions (e.g., CO) while other emissions are greater during un-congested operating speeds (e.g. Nitrogen Oxides). Third, 60% or more of total emissions from a trip may be related strictly to the cold start of the vehicle. This is particularly important where a commuting trip begins with an auto trip to the rail station either as a kiss-and-ride or park-and-ride trip. Fourth, a relatively small percentage of vehicles, perhaps as few as 9%, may be responsible for as much as 50% of all emissions (Orski, 1994). This suggests that if a particular transit program, or other policy, is to be significantly effective in reducing emissions it must be targeted at people driving super-emitting vehicles which is a difficult expectation for passive transportation demand management. Fifth, diesel powered train engines, the type to be used in the North Corridor, are considered to be high polluters thereby potentially off-setting part or all of the emission reductions achieved through avoiding SOV travel.

From a LOS perspective, all of this suggests that roadway congestion conditions and amount of travel are but part of the evaluation process. This is perhaps most striking in the observation that overall CO emissions in the Puget Sound Region from mobile sources have dramatically decreased in the last ten years (approximately 30%) because of technological improvements, emission testing and most recently the introduction of oxygenated fuels, despite a significant increase in overall VMT and congestion.

Given all of these issues, and the complications they represent for evaluation, it is beyond the scope of this analysis to attempt to fully assess the outcome and effectiveness of the proposed commuter rail service from an air quality perspective. Any attempt to comprehensively estimate the net emission reductions for such a service would need to examine the emission component of trips to the rail line, trips on the rail line, vehicle trips avoided on the highway system, the character of the vehicles taken out of service and their emission rates.

A partial analysis addressing one of these components, based strictly on the gross emissions avoided for the component of travel on the commuter rail system itself, suggests the following conclusions. First, 4000 trips per day at an average travel distance of 25 miles equals approximately 100,000 miles of daily auto travel avoided through use of the rail service. Assuming an average fuel efficiency of 25 miles per gallon and that each gallon of fuel consumed, on average, results in one pound of emissions the daily gross emission avoidance would be 4000 lbs (or 2 tons) and on an annual basis approximately 520 tons. Using the annualized total cost estimates from above the total cost per ton emission avoided would be \$22,500 to \$33,000 per ton. To put these numbers in perspective, Morrow (1992 p.206) presents a list of typical rates per ton for stationary source pollution control efforts in California where the averages range from \$200 to \$10,000 per ton and the highest rates seen approach \$25,000 per ton.

Do the incompletely assessed values calculated for the commuter rail service represent a reasonable transportation control measure for CAA purposes? This question is difficult to answer without further elaboration and without comparison to other alternative strategies. Again, as in the previous section, this analysis ends where the decision-making and valuing process begins. Some interpretation must be made about whether or not the investment in a proposed activity or policy, relative to some alternatives, is an effective choice for attaining the stated goals. All of this again suggests that in order to more fully understand what some alternative public transportation program or policy means from a LOS perspective it is necessary to explicitly incorporate the analysis of outcomes and effectiveness within the LOS framework.

Table 3 summarizes estimates derived in this, and the previous section, thereby highlighting the additional perspectives on assessment associated with congestion management and air quality concerns. These additional perspectives do not provide easy answers for the evaluation process, rather they refocus the process on a different set of questions. In general these results emphasize that defining and interpreting some LOS in a multi-modal environment requires direct incorporation of these outcome perspectives within the LOS framework.

Table 3. Additional Evaluation Perspectives For The Commuter Rail Service

Evaluation Element	Commuter Rail
Goals and Objectives	Provide transit alternative and connections to multi-modal terminals. Reduce energy consumption and air pollution.
Inputs	Capital Improvements \$142 million Annual Operating Costs = \$5,569,000 Daily Operating Costs (5-days/week) = \$21,419
Activities	12 trips per day (30 min headway during morning and afternoon peak periods) Daily Vehicle Hours = 6 Travel Time = 56 min.
Efficiency	Daily Operating Cost/ Vehicle Hours = \$1,561 Daily Operating Cost/Vehicle Miles = \$130
Response To Activities	Passengers Per Day = 4,492 (1993 Technical Estimate) (Passengers Per Day = 3,000 1994 Phase I Study Options Results Report. Calculations in this table based on 1993 estimate)
Effectiveness:	
Activity	Passenger Trips/ Vehicle Hour = 750
Cost	Operating Cost/ Passenger = \$4.77 Operating Cost/Passenger Mile = \$0.17 Total Cost/Passenger Mile = \$0.37, or \$0.50, or \$0.80????
Transportation System Outcomes	Estimated Impact on Peak-Period Corridor Vehicle Travel Volumes = 3.5%
Community Outcomes	Gross Estimate of Annual Emissions Avoided for rail equivalent VMT reduced = 520 tons
Outcome Effectiveness and Goal Attainment	Total Cost Per Percentage Travel Volume Avoided = \$3.4 to \$4.9 million. Total Annual Cost Per Vehicle Removed = \$3000-\$4300 Total Annual Cost per ton of pollution avoided = \$22,500-\$33,000

4.4 Discussion

This case study demonstrates several important points about development of LOS evaluation frameworks and the treatment of public transportation evaluation in a multi-modal environment. First, this example emphasizes that the focus of assessment in such cases is clearly on outcomes and level of goal attainment attained from a given program or policy. In other words, the application of the LOS concept is primarily concerned with the results of transportation activities or policies and the relative effects of different types and levels of activity in terms of results rather than on the level of inputs or level of activities as we saw in the previous case studies. These observations imply that the definition and application of the level of service concept in multi-modal contexts is fundamentally different than in its traditional application in either public transit or roadway analysis alone. In the case of multi-modal LOS evaluation the process hinges on roadway conditions and air quality outcomes with various policy and program alternatives feeding from the input side, and with effectiveness criteria clearly anchoring evaluation on the outcome side. This approach to LOS interpretation, where evaluation is centered on outcome effectiveness, directly contrasts with traditional LOS evaluation centered strictly on roadway conditions, or for the case of transit, the supply of activities offered to the public.

Second, the focus on results and effectiveness in this multi-modal/multi-policy approach to LOS reveals that much of the evaluation process hinges on the interpretation, or valuing, of outcomes in a relative sense between different policy alternatives. The centrality of considering policy alternatives in this type of analysis recasts the LOS question from a perspective concerned with specific operating details, supply of activities and to a certain extent even the relative demand for some service to one concerned with a net outcomes or results. Furthermore, because a consideration of costs is inevitably important in the interpretation of specific types of outcomes, like the number of vehicles removed from a travel stream or ton of pollution avoided, this type of analysis ultimately turns to a specific focus on outcome cost effectiveness. The use of outcome effectiveness as a criteria for exploring transportation system and policy alternatives related to congestion and air quality concerns is undoubtedly a complicated undertaking, but it appears many, if not all, of the parameters may to various degrees of reliability be quantified based on typical transportation modeling outputs. This contrasts with the inherent difficulty in valuing some other types of social outcomes associated with economic development and social mobility as described in the first case study.

Overall, this example reveals that an important part of the multi-modal LOS evaluation process rests on the exploration of alternative policies and programs including those that because of current institutional arrangements in transportation remain outside of the normal range of alternatives explored. These non-traditional alternatives include such options as private-sector public transportation services and congestion pricing. An alternative and outcome-based evaluation emphasis is not just concerned with variants of service levels for a single type of activity, such as a fixed route bus or train, rather the focus is on how entirely different programs

or policies might address the stated goals. In the case of the proposed commuter rail service the only alternative examined was enhanced express bus service. The original estimates embedded in this analysis resulted in the conclusion that rail was a competitive and feasible option compared to express bus albeit at a three-cent difference per passenger mile. Subsequent estimates of costs and ridership bring this conclusion into question but this issue has yet to appear in the documents produced by the RTA. Thus, an alternative was examined but only on a very limited basis and this alternative analysis has not, to our knowledge, been updated based on changing assumptions.

The illustrative, and incomplete, outcome-based analysis of the proposed commuter rail service developed in this case study highlights how difficult it is to approach the LOS evaluation problem with the expectation that "objective" standards can be developed. There is a high degree of interplay between public transportation activities, policies and programs in a multi-modal environment where the desire is to effect changes in the functioning of the transportation system or related air quality outcomes. The results expected appear to rest as much on the range of alternatives considered as on the level of a particular activity. Ultimately, the assessment of outcome effectiveness and goal attainment related to these issues requires a form of relative evaluation not easily suited to standardization largely because public transportation is just one of many alternative approaches for improving highway LOS and associated air quality problems. This observation suggests that perhaps the most important role for state involvement in public transportation assessment for such applications would be to investigate and document some rough guidelines or outcome expectations for different types of policies or services that could be used as a starting point for the political discussions that ultimately surround transportation decision-making processes.

5.0 Case Study Conclusions

The three case studies examined in this research have provided a diverse range of situations important for understanding the development and application of LOS definitions as part of comprehensive evaluation frameworks for public transportation particularly at the state level. In large part, this study has attempted to provide examples that reflect the state's interest in public transportation evaluation and to reveal how the multiple interests of the state necessitates an approach to LOS and evaluation that is flexible and adaptable to different purposes.

The first example presented a case reflecting what the WSDOT Public Transportation Office sees as its primary mission which is to insure that all citizens of the state have some basic level of mobility and accessibility both within communities and between regional centers. This is perhaps the core definition for public transportation LOS from the state perspective when public transportation activities are evaluated in isolation from other transportation modes. In this particular example, and in many other similar situations, WSDOT stepped forward as a facilitator to support local community efforts to resolve a basic transportation need ultimately providing a significant amount of seed money to initiate service. Overall, the conclusions from this example emphasized two important points relevant to the definition of LOS and the state's interest in public transportation evaluation. First, the analysis revealed how integral a LOS approach concerned with the supply of public transportation activities is with the other elements of evaluation. Specifically, the example highlighted how assumptions about the provision of service, funding and equity all affect the interpretation of LOS possibilities.

Second, this example emphasized the significant need for some systematic frame of reference to fully document, and interpret, the evaluation of public transportation services where there are multiple interests involved in the planning and decision making process. The WSDOT, community activists, and local transit providers all have entered into development of this particular service with different levels of commitment and expectations for success without documentation. Hence, once the initial seed funds run out for this service all of the parties must return to the evaluation process to once again decide what future services will be offered in this area.

This situation has revealed that it is critical for the WSDOT not only to facilitate new activities through funding, but also to provide on-going assistance in service evaluation and decision making at the local and regional level. This facilitated assistance in the area of evaluation need not take the form of state standards or mandates, rather the state should continue to build on its role as facilitator by helping all of the involved parties in these local contexts to better appreciate the perspectives on evaluation they each bring into the political and practical processes of developing and maintaining public transportation activities. This example has stressed that the concept of level of service applied in such contexts potentially involves a number of difficult equity-related trade-offs as well as some difficult to quantify social and economic benefits of public transportation. All of these issues affect our interpretation of what level of service is adequate, fair and meaningful within context-specific situations.

The second case study examined the development of LOS definitions under the current planning efforts of growth management. The results from this analysis revealed a significant disjuncture between the intents of growth management reflected in the concurrency concept, community planning goals and actual LOS definitions in three King County Cities. The reasons for this disjuncture were attributed primarily to the institutional arrangements governing public transportation funding and provision at the county-wide level.

The conclusions from this study emphasized that WSDOT should take an active leadership role in helping communities, and legislators, embrace a more comprehensive approach to LOS definitions under growth management as well as a critical evaluation of current public transportation institutional barriers. Although one approach to the significant problems observed in the implementation of growth management planning would be for the state to recommend some standardized levels of public transportation activities at the community level, it is unlikely that such an approach could effect the kind of results in public transportation delivery expected under growth management nor would it resolve the current barriers preventing communities from actually insuring that public transportation will be provided to meet community goals. An alternative is for the WSDOT Public Transportation Office to once again build upon its role as facilitator by working with communities, transit providers, and legislators as necessary, to bring the issues affecting the delivery and evaluation of public transportation to a common point of reference.

The third case study presented an example discussing the multi-modal, and multi-policy LOS evaluation demands associated with ISTEPA and the Clean Air Act. This discussion revealed the expanded emphasis for LOS under these mandates on outcomes outcome effectiveness, and alternative analysis. The examination of the proposed commuter rail services in the North Corridor from this perspective on LOS and evaluation provided additional insight for a state interest in evaluation for this, and other projects with multi-modal congestion and air quality implications. The existing state perspective of evaluation for this service, which provided the initial frame of reference for studying its feasibility, was shown to be limited to one dimension of evaluation that obscured the level of outcome-based evaluation expected under recent congestion management and air quality legislative mandates. This example also highlighted how the multi-modal, multi-policy, LOS evaluation of public transportation activities centers more on the interpretation of relative outcomes, and relative goal attainment, associated with policy/program options as it does on detailed concern over LOS as thought of in the traditional sense of fixed-route frequency of service or other activity indicators normally thought of in public transportation. Therefore, the conclusion from this study pointed toward a distinct state role in providing broad oversight, and potentially ranges of values for outcome effectiveness, as yet a third example of the need for an enhanced state role in facilitating public transportation evaluation and LOS.

The findings from these case studies, as well as our associated efforts to provide input to a regional transportation planning process on the Olympic Peninsula, have resulted in several

observations that currently run counter to some of the planning demands at the state level. Hopefully, despite these differences the ideas and observations made in this research will be of value to the WSDOT when it returns to its day-to-day business of facilitating public transportation, mobility and accessibility for all the citizens of the State of Washington. Ultimately, these are the only state interests that really matter.

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Working Paper 2.2

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"Measuring Level of Service and Performance in Public Transportation"

An Access Assessment Framework For Washington State

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1.0 Introduction

This paper documents an approach to define Washington State's interest in basic access criteria and standards for its citizens. These criteria and standards have been developed in support of WSDOT's State Public Transportation and Intercity Passenger Rail Plan which is part of the State-Wide Multi-Modal Transportation Plan. In effect, the standards and criteria in this paper are a response to one of the fundamental concerns for evaluating state interest related to the provision of public transportation. This concern is captured in the following goal statement.

Every citizen of the State of Washington should have personal access choices for urban, rural, and intercity travel that are safe, reliable, affordable, and convenient.

The access criteria and standards proposed in this paper have been developed for two purposes. First, they provide a starting point for defining a minimum ability of all citizens in the state to travel, both within and between communities, when a private means of transportation is unavailable to them. Second, the selected criteria and proposed standards provide a measurement tool to assess the extent to which communities, regions, and the state are achieving their access goals. Specifically, this framework can be used to estimate the proportion of a community's, or county's, population that currently has access to basic access services as defined by the selected criteria.

WSDOT's philosophy underlying the standards framework is to encourage continued development of public transportation services and infrastructure for every citizen in the state. The intent is not to establish a state mandate, but rather to help communities, transit providers, and state legislators in their assessments of how basic access needs are currently addressed and how they might be improved.

The proposed standards presented in this document identify two different levels of attainment to facilitate the interpretation of basic access within communities. The first level reflects what the state considers to be a minimum definition of access. The second level, designated as preferred standards, defines an option in which public transportation can be considered a viable alternative to private vehicles. The range of values suggested at the preferred level should not be interpreted as the ideal or representative for every context; rather they should be used as a starting point for the customization of standards to fit local needs. Overall, the standards noted in this document are in draft form for discussion purposes only.

The remainder of this document describes the details of the framework, its use as an evaluation tool, and the data requirements and analytic procedures necessary for implementation. The final section presents a prototypical application of the framework based on readily available, or estimated, data for one county in Washington State.

2.0 Access Criteria and Standards

2.1 Access Criteria

The access goal described in the introduction implies that four criteria are necessary to define basic access for Washington State citizens. These criteria, which were developed in conjunction with WSDOT's Access Index Working Committee, are listed below and are also found in the left-most column of Table I.

- 1) **Choice** or an alternative for access. (Do citizens have a choice for access if a private vehicle is not available? In effect, do they have spatial access to some type of public transportation service and are they eligible to use the service?);
- 2) **Availability** or days, hours, and frequency of service. (Are the access choices available weekdays only or everyday? What hours of the day are the services available? How often, or what minimum number of bi-directional trips, are potentially available? Are there restrictions in terms of purpose, reservation/departure times that limit availability of service?);
- 3) **Inter-city connections** to other inter-city transportation services. (Do citizens have a access option to other communities in the State of Washington?);
- 4) **Affordability** of community access. (Can citizens take advantage of services at a reasonable cost?).

2.2 Minimum Standards

The proposed minimum standards for access criteria identified above are detailed in the two additional columns labeled Fixed-Route and Paratransit in Table I. These columns, and the standards they contain, should be interpreted on an either/or basis depending on what is best for local conditions. That is, for each row in the table, a particular standard would be met by providing an access option under either the fixed-route column or the paratransit column. So, for example, in the case of the choice criteria citizens with either a fixed-route service within 3/4 mile of their residence or with unrestricted dial-a-ride service would be considered to have an access option. Those without either, would be considered without an access option.

The purpose of these standards is to provide a basis from which to evaluate whether or not all of the minimum access criteria are satisfactorily met for each citizen. In order for basic access to be achieved, all of the questions and standards associated with each criteria must be answered yes in one column or the other. If one or more of the criteria are not satisfied then they would lack the minimum level of access for the given criteria. It is possible with this approach to evaluate both the overall percentage of people meeting all of the criteria and the percentages along each criteria separately.

2.3 Preferred Access Standards

An alternative set of preferred standards are presented in the fifth and sixth columns of Table I. These standards, represent a next level of viability for public transportation access alternatives.

Table I Minimum and Preferred Access Standards

Criteria	Access Issue Addressed	Minimum Access Standards		Preferred Access Standards	
		Fixed-Route	Paratransit	Fixed-Route	Paratransit
Choice	Do citizens have a choice for access if a private vehicle is not available? Are there eligibility restrictions that limit citizen access?	Citizen within <u>3/4</u> mile of a route.	Citizen with unrestricted dial-a-ride alternative.	Citizen within <u>1/4</u> mile of a route.	Citizen with unrestricted dial-a-ride alternative.
Availability	Are the access choices available weekdays only or everyday?	5 days per week;	5 days per week	7 days per week	7 days per week
	What hours of the day are the services available?	8am-6:00pm	8am-6:00pm	7am-11:00pm	7am-11:00pm
Inter-City Connections	How often are services potentially available? Are there trip purpose, reservation, or departure time restrictions that limit access?	Minimum of <u>two</u> bi-directional trips available per day.	Minimum of <u>one</u> round trip available per day. Maximum <u>24</u> hour advance reservation for travel within <u>4</u> hours of desired departure time.	Hourly <u>bi</u> -directional travel available .	Minimum of <u>two</u> or more round trips available per day. Maximum <u>12</u> hour advance reservation for travel within <u>2</u> hours of desired departure time.
	Do citizens have a access option to other communities?	Connections with inter-city services.	Connections with inter-city services.	Connections with inter-city services.	Connections with inter-city services.
Affordability	Can citizens take advantage of services at a reasonable cost?	Fares less than or equal to 150% of state-wide average fare.	Fares less than or equal to 150% of state-wide average fare.	Fares less than or equal to 150% of state-wide average fare.	Fares less than or equal to 150% of state-wide average fare.
		Volunteer Services or Transportation Vouchers Available	Volunteer Services or Transportation Vouchers Available	Volunteer Services or Transportation Vouchers Available	Volunteer Services or Transportation Vouchers Available

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The preferred level for access standards reflect a next level of public transportation access. As such, the proposed preferred standards measure whether public transportation is viable compared to the automobile. As noted in the introduction the proposed preferred standards are not considered to be the ideal for every context; rather they represent a starting point for considering how to increase the levels of access for all citizens in some local context.

The preferred standards, for example, suggest on the Choice dimension that it is preferable for citizens to be within 1/4 rather than 3/4 of a mile of a fixed route service. Decreasing the access distance to public transportation is one way of potentially making the system more accessible to patrons. On the Availability dimension, the preferred standards suggest that public transportation services should be available seven days a week rather than only five days per week.

In order to encourage communities to develop and document their own preferred access standards a blank worksheet is provided at the end of this document. This worksheet could, for example, be used in a public input session to help citizens identify where, and how, to prioritize local public transportation standards and improvements.

3.0 Evaluating the Status of Access

This access framework and the standards it contains provide a means by which to assess the proportion of citizens with and without minimum access services. In other words, the total number of citizens that meet, and fail to meet, these minimum standards can be calculated thereby producing an estimated percentage of citizens with access in a community, region, or statewide.

These estimates can also be used by the state and local communities to assess the costs of additional public transportation services to raise either the percentage of citizens falling under the minimum standards or some other preferred level. Figure 1 portrays the decision-making situation that will result from the application of these standards in which marginal costs change with increases in the percentage of citizens with minimum access services.

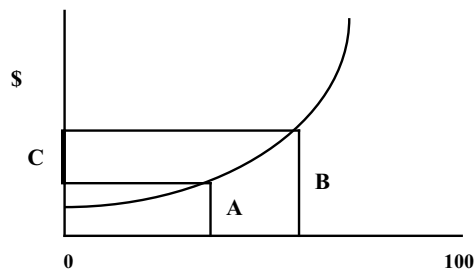


Figure 1. Marginal Costs in attaining minimum standards for increasing proportions of the population.

The vertical line, labeled “A”, represents existing conditions in some context where approximately 50% of the population currently meets the minimum access standards. The second vertical line, labeled “B”, is the point where 75% of the population meets the minimum standards. The difference between these two levels, segment C on the vertical axis labeled “\$”, represents the additional funds necessary to achieve the increase in percent of population meeting the minimum level.

Figure 1 implicitly recognizes that it may not be possible to provide some level of access for every portion of the state because the cost of reaching more people typically increases substantially as the proportion served approaches 100%. The basic relationship graphed in Figure 1 could be used to portray the marginal costs of changes in preferred as well as minimum standards. Furthermore, each dimension of the proposed access assessment framework could be examined separately as a family of cost curves for evaluation purposes. This type of information about current vs. increased levels of minimum or preferred standard attainment will be useful to WSDOT in helping to set funding priorities to enhance access services in contexts where additional local funding may not be forthcoming.

This discussion of changes in marginal costs associated with different levels of access attainment serves as an important reminder that WSDOT’s purpose in establishing this framework is not to dictate standards to local communities; rather their goal is to help communities assess where they are in terms of access and to identify the necessary resources to improve access for all citizens.

4.0 Information Requirements and Analytic Approach

In order to assess the proportion of citizens with a minimum or preferred level of access in some context it is necessary to collect several types of data and to perform certain analytic procedures. This section outlines the information requirements and procedures associated with each framework dimension. All of the information necessary to compute these proportions is commonly available from census sources (i.e., population information) and transportation providers. In the latter case, we expect that WSDOT’s survey of public transportation providers conducted for the State Public Transportation Plan should provide most of the information about local and regional activities. In addition, recent advances in the computer software dedicated to these types of problems (i.e. Geographic Information Systems or GIS) make the costs of software and data purchase very affordable for WSDOT or local providers to carry out the analytic procedures associated with this framework. As a case in point, the software and data used in this analysis cost only \$399.

In any case, the process of assessing proportions of a community’s population meeting the minimum or preferred levels of access identified in the standards essentially involves

stepping through the framework dimensions answering a number of questions about the character of services in a given context. These questions and procedures are identified in Table II which can serve as a worksheet to complete the analysis.

The analysis process documented in Table II involves three basic steps. First, define the area served by public transportation activities. Second, estimate the population within the service area. Third, calculate percentage of population within the service area against the total population. This process is repeated for each framework dimension based on the individual criteria, or access questions, identified in Table II.

The resulting percentages along each dimension could be portrayed in graphic form to help summarize the results of a particular analysis or for comparisons among different contexts if this should be desired. Figure 2 provides an example of how this graphic might be formatted. This technique can be applied at any desired scale of analysis. The end result of performing this analysis will provide WSDOT, and local communities, focused information for addressing particular access deficiencies relative to the different access criteria. In Figure 2, for example, the chart highlights that it is very difficult for most of the population in the Community of Oz to complete inter-city travel.

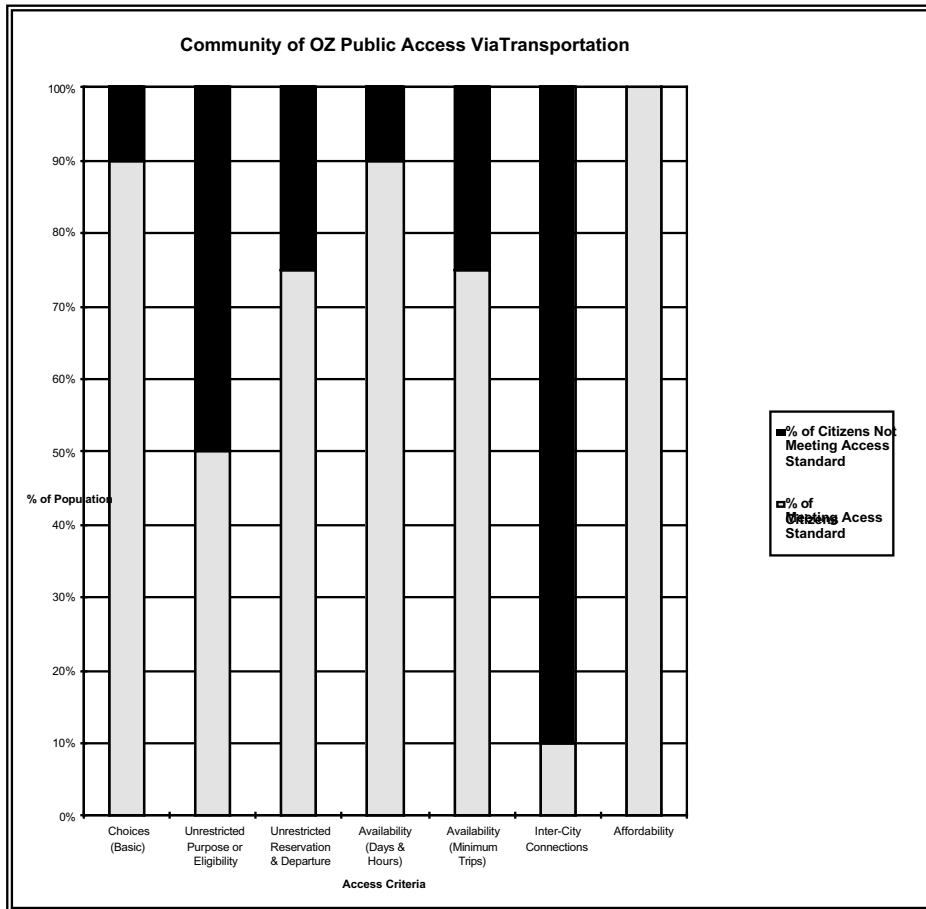


Figure 1. Example chart showing percentage attainment for minimum standards.

Table II Worksheet For Assessing Proportion of Citizens Meeting Access Criteria and Standards

	Fixed-Route	Paratransit	Procedure
Choice: Do citizens have a choice for access if a private vehicle is not available?	Where are citizens located? Where are the fixed-route service areas?	Where are citizens located? Where are the dial-a-ride service areas?	1. Identify populations on map. 2. Identify fixed-route and dial-a-ride service areas on map. 3. Calculate % population with fixed-route or dial-a-ride choices.
What eligibility restrictions exist, if any?		% of Citizens Meeting Standard Where are the dial-a-ride services without restrictions?	4. Recalculate procedures 2-3 for any purpose or eligibility restrictions.
Affability: What are the travel reservation and departure time restrictions		% of Citizens Meeting Standard Where are the dial-a-ride service areas meeting reservation and departure time standards?	5. Recalculate procedures 2-3 for any travel reservation or departure time restrictions
When are the access choices available (days and hours of operation)?	Where are the fixed-route service areas for the days and hours specified in the standard?	% of Citizens Meeting Standard Where are the dial-a-ride service areas for the days and hours specified in the standard?	6. Recalculate procedures 2-3 for any operating time restrictions.
How often are services potentially available are there any purpose restrictions?	Where are the fixed-route service areas providing the minimum number of potential daily trips?	% of Citizens Meeting Standard Where are the dial-a-ride service areas providing the minimum number of potential daily trips?	7. Recalculate procedures 2-3 for any minimum trip restrictions.
Inter-City Connections: Do citizens have a access option to other communities?	Where are the fixed-route service areas providing connections to inter-city services?	% of Citizens Meeting Standard Where are the dial-a-ride service areas providing connections to inter-city services?	8. Recalculate procedures 2-3 for areas not connecting to inter-city services.
Affordability: Can all citizens take advantage of services at a reasonable cost?	Where are the fixed-route service areas that meet the standards for affordability?	% of Citizens Meeting Standard Where are the dial-a-ride service areas that meet the standards for affordability?	9. Recalculate procedures for any cost restrictions

5.0 Prototype Application

5.1 Context

This section presents an example of how the proposed framework and standards would be applied. The context for this example is Jefferson County, a primarily rural county on the Olympic Peninsula with a total population of approximately 20,000 (1990 Census Estimates). Of this total, roughly 17,000 citizens live in the Northeast corner of the county north of SR-104. The remainder of the population is dispersed primarily between the eastern flank of the Olympic Mountains and Puget Sound with approximately 700 citizens living in the western part of the county.

Five public transportation routes with a regional orientation (both fixed route and route-deviated services) are provided in the county.¹ Four of the regular routes (1,7,8, 9) connect Port Townsend with other communities in Jefferson County and with connecting services to Clallam and Kitsap counties to the northwest and southeast respectively. Dial-a-ride and volunteer van services are provided in the populated Northeast corner of the county north of SR-104 for qualifying individuals. The west-side of the county has one recently initiated public transportation route which is operated as a route-deviated service.

For the purposes of this example, a prototype GIS application was developed to assist with the estimates of population having access to dial-a-ride and fixed-route services. The maps in Figures 4 and 5 portray the general context of Jefferson Transit fixed-route services with a 3/4 mile buffer zone around each route. This buffer distance corresponds with the access distance specified in the proposed minimum standards. The shaded portion on the map in Figures 4 and 5 represents the dial-a-ride service area north of SR-104. The detailed map in Figure 6 shows the underlying street network for part of the county in the Port Townsend/Hadlock vicinity. This map shows how a GIS system provides a flexible framework for visualizing service areas at various levels of detail. If desired, this flexibility could also be used to examine the access options of individual citizens based on their place of residence.

¹ There are two other circulator routes operated exclusively within the City of Port Townsend that were not included in this prototype analysis because of time constraints.

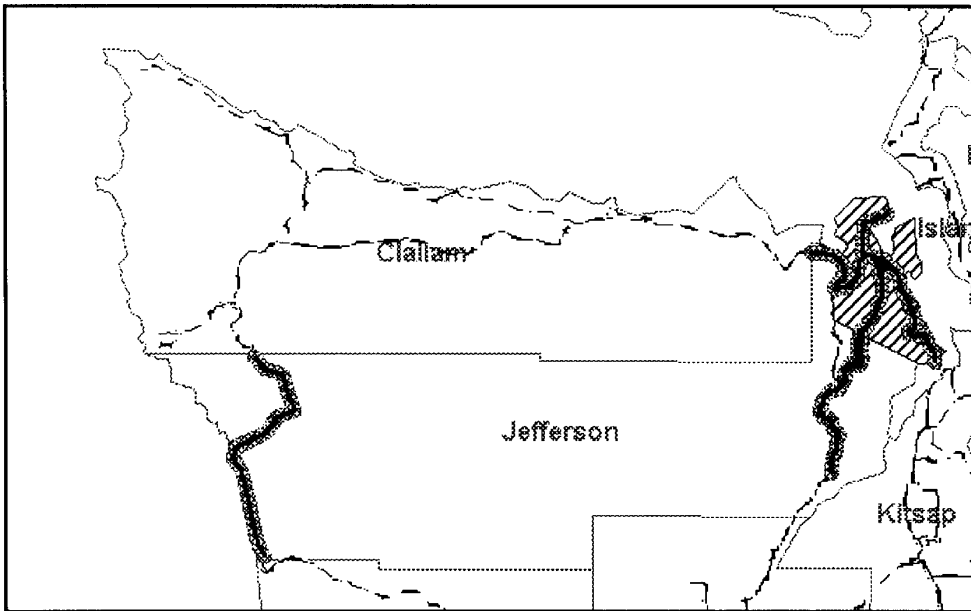


Figure 4. Jefferson Transit fixed-route and dial-a-ride service areas.

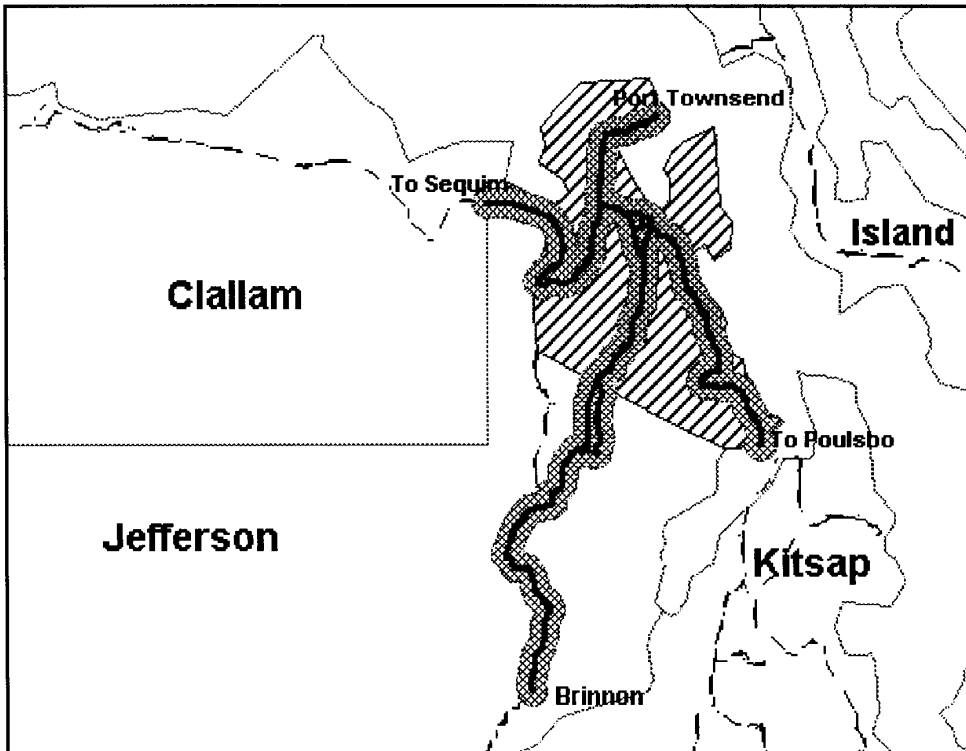


Figure 5. Northeast Jefferson County transit service areas (shaded area north of SR-104)

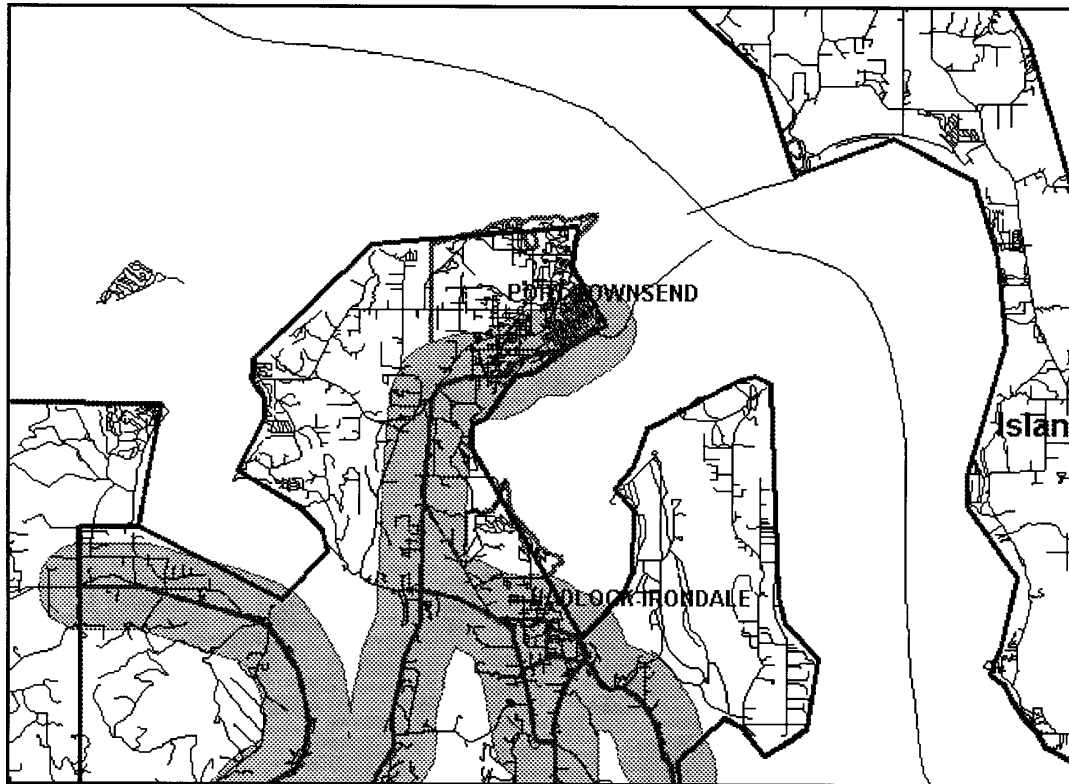


Figure 6. Detailed view of fixed route services in populated northeast corner of Jefferson County.

5.2 Analysis and Results

The geographic information associated with fixed-route and dial-a-ride service areas, portrayed above, provides one part of the necessary data to complete the analysis. Population information from the 1990 Census (tract level) was combined with the route information (via overlay procedures in the GIS) to derive estimates of population meeting the various access criteria and standards proposed in the previous sections of this paper.²

The results of the analysis are summarized in Table III in three major groupings along each of the access framework dimensions. The first and second groupings present the non-exclusive results for fixed-route and dial-a-ride services. The third grouping, labeled “Either 1 or 2”, presents the union of the two separate cases eliminating any duplication within the summaries taken separately. For example, in the second row of Table III the reader will notice that the total number of citizens meeting the access standard under the third grouping does not

² It is important to note that the overlay procedure using census tracts or other area-based features assumes a homogenous population distribution within each census tract. Since population distributions are unlikely to be homogenous a degree of error is introduced into the results from this assumption.

equal the sum of the other two columns. This is because 1,500 dial-a-ride eligible citizens, included in the total of 2740 under the dial-a-ride grouping, were also counted in the total under the fixed route grouping (i.e., 7,500). The last two columns in the table are charted in Figure 7.

Table III Estimated Proportions of Citizens Meeting Minimum Access Standards

Criteria	Total County Pop. (1990)	# of Citizens Meeting Fixed-Route Access Standard	% of Citizens Meeting Fixed-Route Access Standard	# of Citizens Meeting Dial-A-Ride Access Standard	% of Citizens Meeting Dial-A-Ride Access Standard	Total # of Citizens Meeting Access Standard	Overall % of Citizens Meeting Access Standard	Overall % of Citizens Without Access Option
Choice (Spatial Access)	20,000	7,500	37.5%	13,700	68.5%	14,500	72.5%	27.5%
Unrestricted Purpose or Eligibility*	20,000	7,500	37.5%	2,740	13.7%	8,740	43.7%	56.3%
Unrestricted Reservation & Departure	20,000	7,500	37.5%	2,740	13.7%	8,740	43.7%	56.3%
Availability (Days, Hours, & Min. Trips)	20,000	7,500	37.5%	2,740	13.7%	8,740	43.7%	56.3%
Inter-City Connection	20,000	7,500	37.5%	2,740	13.7%	8,740	43.7%	56.3%
Affordability	20,000	7,500	37.5%	2,740	13.7%	8,740	43.7%	56.3%
*For the purposes of this example we have assumed all citizens age 65 or older (approximately 20% of county wide population) are potentially eligible for dial-a-ride services.								
**These figures represent the union of the other two columns; they are not additive.								

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The results of the analysis for the first level on the Choice dimension (spatial access to service) suggests 37.5% of the county’s population has fixed-route access to transit and 68.5% of the population reside in the area that has dial-a-ride service. The total percentage of citizens living in an area with either fixed route or paratransit equals 72.5%.

At the second level along the Choice dimension the percentage of citizens with a dial-a-ride choice decreases to approximately 13.7% because this alternative has eligibility restrictions. These restrictions generally limit this service to those with some sort of disability. For the purposes of this example we assumed that any of the elderly population in the dial-a-ride service area could conceivably become eligible for the service³. The 13.7% number thus results from

³ This estimate does not consider the number of persons living in this area that are disabled but younger than 65 and thus potentially users of the dial-a-ride services.

multiplying 20% (an estimate of population 65 or older) times 13,700 (the total population within the dial-a-ride service area). Overall this eligibility requirement reduces the percentage of citizens meeting the minimum access standard to 43.7%.

On the Availability dimension Jefferson Transit meets or exceeds all of the minimum standards for days, hours, and minimum trips. In general, services are provided no fewer than 5 days per week with several routes offering service seven days per week. The minimum number of trips per day ranges from 2 to 12 on the five fixed routes considered in this analysis. Dial-a-ride service also meets the standard as it is available one or more trips per day for those who qualify. Although the dial-a-ride services do meet the availability standards the presence of eligibility restrictions at the previous level of the framework results in the same percentage of citizens meeting the minimum access standards (i.e., 13.7% for dial-a-ride). This basic eligibility restriction affects the percentages seen in the remaining levels in the framework as well even though the services provided generally meet or exceed the minimum standards for these additional criteria as discussed in the following paragraphs.

On the Inter-City Connection dimension all of the services offered by Jefferson Transit generally meet the minimum proposed standards of providing connections to other cities in the county and region. However, a close examination of the orientation of these routes reveals that in several cases the connections offered are not the most direct, and therefore, convenient for the user in terms of connections required. Although these issues are not identified in the standards framework they are a local concern to Jefferson Transit. In fact, these issues are one of the areas identified for improvement in the Peninsula Regional Transportation Plan. As such the local standards, or preferred levels of connection, seem to be serving the state's interest in promoting enhanced viability of public transportation alternatives.

Finally, on the Affordability dimension Jefferson Transit's base fare of 50 cents-to- one dollar for fixed route services, depending on the number of zones, and 60 cents for dial-a-ride are well within the minimum standards for affordability. In addition, various community groups and social service providers offer vouchers for those unable to afford the fares.

5.3 Discussion

This example, based on very rough, aggregate-level census estimates of population distribution relative to public transportation service areas has shown that the proposed access criteria and standards can be applied to Washington communities. This application potentially can support the analysis and evaluation of access at several different scales including county wide, regional corridors, individual communities and even the access of individual citizens. WSDOT can effectively generate information with this framework that will be useful as a starting point to help facilitate better access options for all citizens in the State of Washington.

As a draft study, developed for discussion purposes only, it is recognized that certain issues of importance to the definition of basic access may be missing in this application. For example, one reviewer suggested that ridesharing and park-and-ride lots should be added as measurable features of the access standard. This and other issues should be closely examined by WSDOT staff, public transportation providers, and community interest groups before the framework is widely applied.

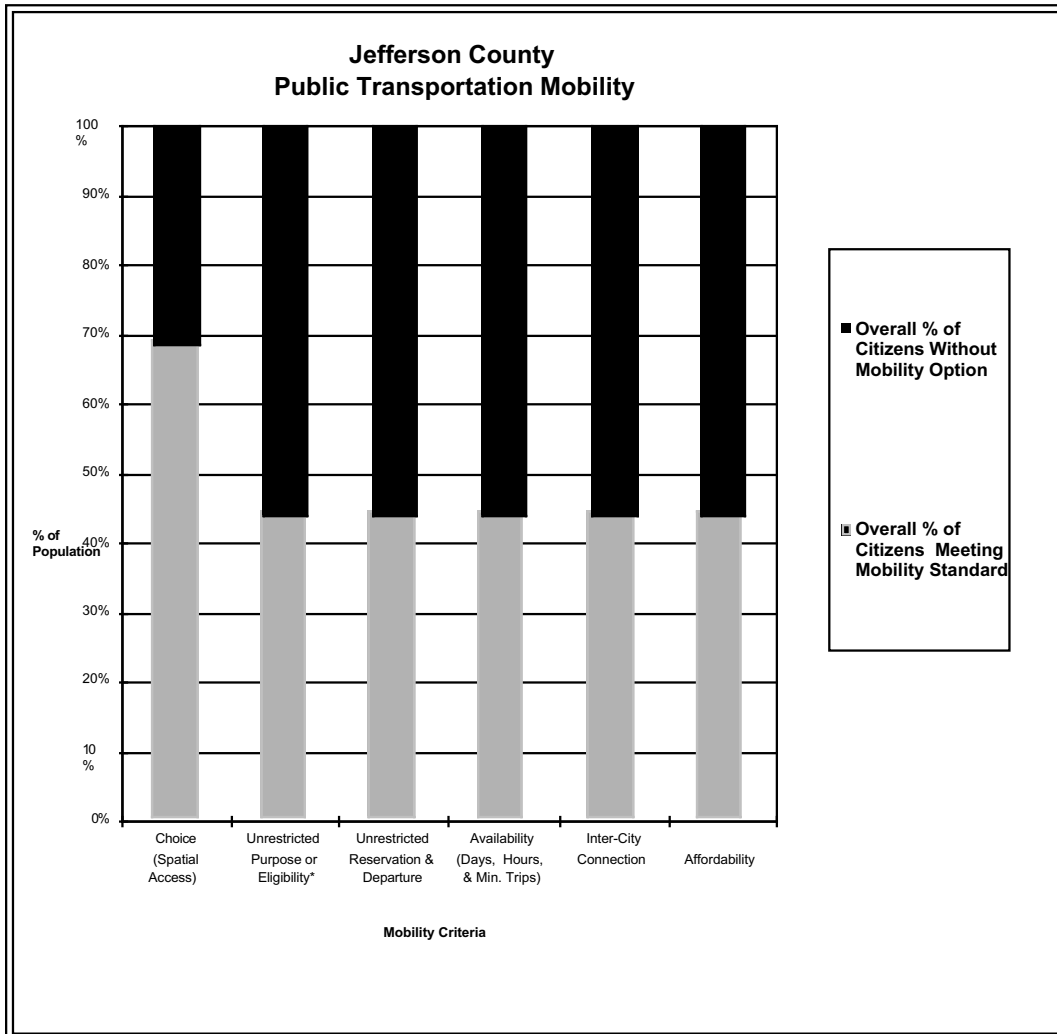


Figure 7. Overall access standard attainment for Jefferson County.

Community Access Standards Worksheet

Criteria	Access Issue Addressed	WSDOT Minimum Access Standards		Preferred Access Standards	
		Fixed-Route	Paratransit	Fixed-Route	Paratransit
Choice	Do citizens have a choice for access if a private vehicle is not available? Are there eligibility restrictions that limit citizen access?	Citizen within <u>3/4</u> mile of a route.	Citizen with unrestricted dial-a-ride alternative.		
Availability	Are the access choices available weekdays only or everyday?	5 days per week;	5 days per week		
	What hours of the day are the services available?	8am-6:00pm	8am-6:00pm		
Inter-City Connections	How often are services potentially available? Are there trip purpose, reservation, or departure time restrictions that limit access?	Minimum of <u>two</u> bi-directional trips available per day.	Minimum of <u>one</u> round trip available per day. Maximum <u>24</u> hour advance reservation for travel within <u>4</u> hours of desired departure time.		
	Do citizens have a access option to other communities?	Connections with inter-city services.	Connections with inter-city services.		
Affordability	Can citizens take advantage of services at a reasonable cost?	Fares less than or equal to 150% of state-wide average fare. Volunteer Services or Transportation Vouchers Available	Fares less than or equal to 150% of state-wide average fare. Volunteer Services or Transportation Vouchers Available		

The *Public Transportation and Intercity Rail Passenger Plan for Washington State* was printed in limited numbers. The plan includes three documents published under separate cover:

1. *Public Transportation and Intercity Rail Passenger Plan for Washington State*, which includes Appendix A
2. Appendix B, *Baseline Public Transportation County Profiles and Regional Maps*
3. Appendix C, *Options for Passenger Rail in the Pacific Northwest Rail Corridor: A Planning Report*

All three documents are available at libraries throughout Washington State. The first and third documents can be downloaded from the Internet at <http://www.wsdot.wa.gov/pubtran>

For the first two documents, information about the availability of additional copies can be obtained from:

Washington State Department of Transportation
Public Transportation Office
P.O. Box 47387
Olympia, WA 98504-7387
Phone: 360-705-7922 or fax 360-705-6820

Also for the first two documents, if you have technical questions, please contact Valerie Rodman at 360-705-7979 or rodman@wsdot.wa.gov

For the third document, copies of the executive summary are available to Washington State residents at no charge while the technical portion of the report is available for purchase. For copies of these rail documents and/or technical questions, please contact:

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