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Trans-Lake Washington Study

Technical Report

November 1999

Washington State Department of Transportation, Office of Urban Mobility

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Preface

The Washington State Department of Transportation (WSDOT), Office of Urban Mobility conducted the Trans-Lake Washington Study over a 14-month period from May 1998 through July 1999. The purpose of the study was to identify a "set of reasonable and feasible solutions" to improve mobility across and around Lake Washington, in the greater Seattle metropolitan area of King County.

A 47-person Study Committee, representing public agencies, neighborhoods, businesses and advocacy groups, was appointed to make recommendations to WSDOT on solutions to carry forward into additional engineering and environmental review. They produced their final recommendations in July 1999. This technical report describes the study process, and documents the technical research and analysis provided to support the Study Committee's decision-making.

In the initial stages of the study, project staff provided background information to help educate the Study Committee on different aspects of the transportation system in the Trans-Lake area. In response to committee requests, staff later provided information about how solutions might be defined and evaluated. "Solution sets" were developed, each including a variety of transportation measures in each of the defined Trans-Lake corridors. Staff conducted evaluations of the solution sets identified by the committee, and presented their findings.

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The solution sets developed and evaluated for the Study Committee were not intended to be screened and selected, but instead to be illustrative and educational, showing the effectiveness, impacts and costs of different approaches to mobility, and illustrating how different transportation methods and modes interact with one another. Based on the evaluation of solution sets, the Study Committee recommended further study of the solution set elements that seemed to work well and which found widespread support among committee members.

HOW THIS REPORT IS ORGANIZED

This technical report provides further detail supporting the study information, and identifies outstanding technical issues where they exist. The Trans-Lake Washington Study is introduced in Chapter 1, including a description of the study area, related federal and regional plans and regulations, and the process the Study Committee followed to develop a problem statement, potential solutions, and recommendations. Chapters 2 and 3 describe existing transportation and environmental conditions. Chapter 4 describes how potential solutions were developed for analysis, and Chapter 5 describes the analyses that were performed and their results. Chapters 6 through 8 include more detailed findings about transportation, impacts and costs of the solution sets, and Chapter 9 describes public outreach efforts and conclusions.

A summary overview of the study accompanies this report (enclosed in back cover inside pocket). Aside from this report, more detailed information is available in a second volume of appendices. An earlier report, Inventory of Existing Conditions Information Technical Report, exists as a separate volume. The Trans-Lake Washington Study web site (www.wsdot.wa.gov/translake) includes the major elements of information the

committee members received during the study, which you can download to your personal computer. A project bibliography is also included at the end of this report.

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Appendices

Appendices A, B, C are attached.

Appendix A Committee Meeting Summaries

Appendix B Bibliography of Technical Products and Major References

Appendix C Abbreviations

Appendices 1 through 9 are included in a separate volume.

Appendix 1 Concept Descriptions and Evaluation Approach

Appendix 2 Solution Set Definitions

Appendix 3 Transportation Demand Management Draft Approach
Evergreen Point Floating Bridge Approach
Passenger Ferry/Bus Ferry Concepts Paper
Trans-Lake Tunnel Crossings Concepts Paper

Appendix 4 Travel Forecasting Methodology and Results

Appendix 5 Bottleneck Analysis

Appendix 6 Environmental Effects Analysis

Appendix 7 Public Survey Methods and Summary Reports

Appendix 8 1999 Trans-Lake Washington Origin and Destination Survey: Methods and Results Report

Appendix 9 Public Meeting Comment Summaries

Trans-Lake Washington Study

1. Introduction & Background

1. Introduction and Background

The Trans-Lake Washington Study was conducted to identify a set of reasonable and feasible solutions to improve mobility across and around Lake Washington. The WSDOT Office of Urban Mobility administered the study, which was authorized by the Washington State Transportation Commission and the Washington State Legislature in 1997.

A Study Committee, composed of 47 representatives of public agencies, neighborhoods, businesses, and advocacy interests was appointed by Sid Morrison, Washington State Secretary of Transportation. The committee was asked to help characterize the problems related to Trans-Lake transportation, and to recommend potential solutions to be considered for further engineering and environmental study. On July 16, 1999, the Trans-Lake Washington Study Committee finalized its recommendations. The committee's recommendations were presented to the Washington Transportation Commission, the Washington Legislature, and other state and local governments involved in managing the transportation system in metropolitan King County.

1.1 Study Area

The Trans-Lake study area was generally defined as the areas between the Snohomish-King County line on the north to I-90 on the south (see Figure 1-1). The east-west ranges of the study encompassed the stretches of I-5 and I-405 between Snohomish County and I-90, and included the major east-west highways listed below:

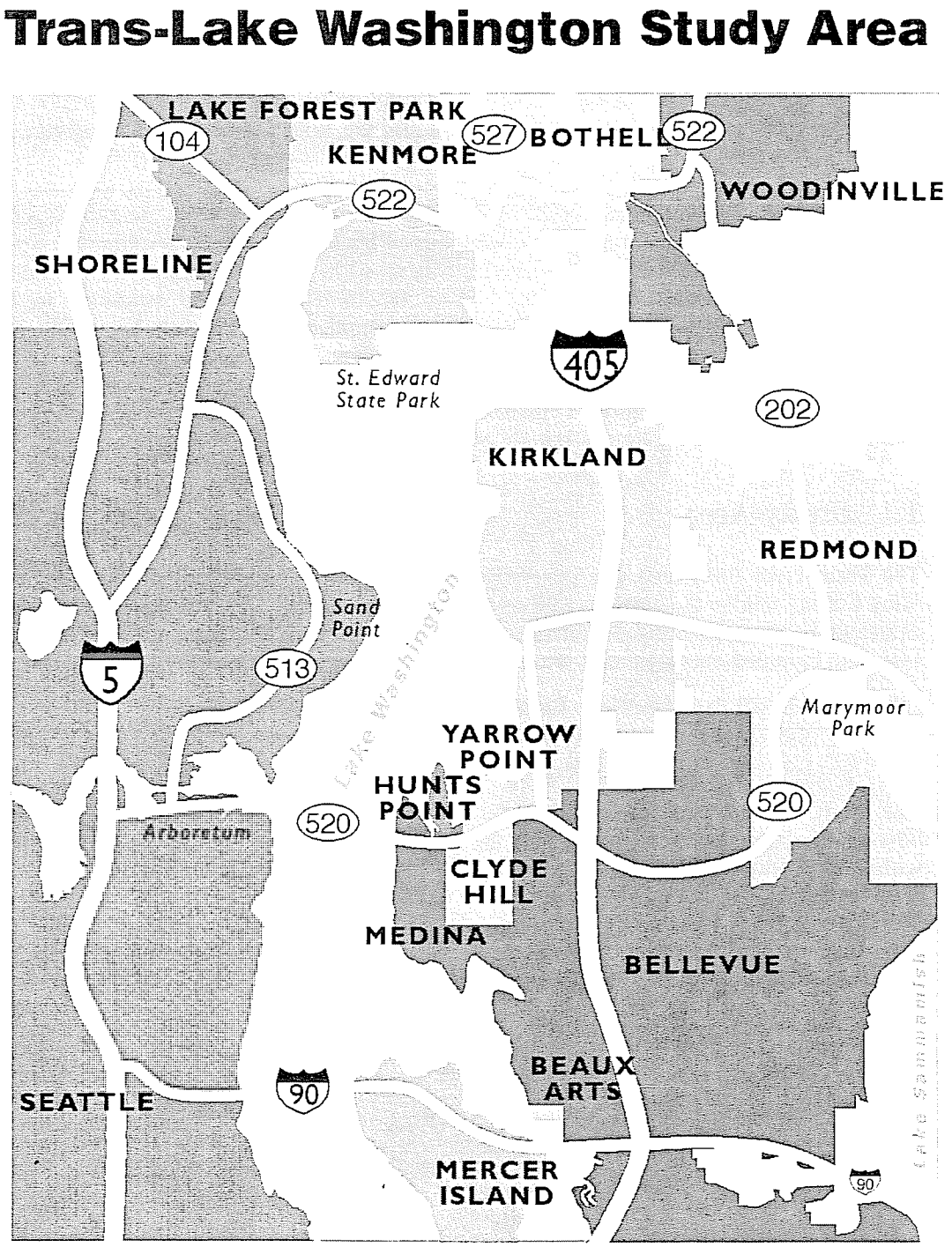
- SR 522 from Seattle to Bothell and Woodinville
- SR 520 from Seattle to Redmond
- I-90 from Seattle to Issaquah

The Study Committee acknowledged that some effects of Trans-Lake traffic extended beyond this area, but recognized that the primary focus of the study should remain within these boundaries.

Most of the Trans-Lake study area is within the Urban Growth Boundaries (UGB) of King County. The following agencies and jurisdictions are responsible for elements of the transportation system or for land use planning within this area:

- Beaux Arts
- Bellevue
- Bothell
- Clyde Hill
- Hunts Pointl
- Hunts Point
- Issaquah
- Kenmore
- King County (including Metro Transit)
- Kirkland
- Lake Forest Park
- Medina
- Mercer Island
- Puget Sound Regional Council
- Redmond
- Seattle
- Shoreline
- Woodinville
- Yarrow Point
- Washington State Department of Transportation
- Community Transit
- Sound Transit (Puget Sound Regional Transit Authority

Figure 1-1. Trans-Lake Washington Study Area



The major components of the Trans-Lake transportation system within the study area are described in Chapter 2, Transportation Setting. Briefly, the major highway elements of the system include:

- **State Route 522** is a four-lane arterial around the north end of Lake Washington, connecting with I-5 at NE 65th Street in Seattle, and with I-405 in Bothell. There are transit-only lanes and queue bypass lanes in some locations, and over 15 major signalized intersections.

- **State Route 520** is an east-west freeway linking I-5 in Seattle to SR 202 in Redmond. It crosses Lake Washington via the Evergreen Point Floating Bridge, which is a four-lane facility. The highway includes a westbound High Occupancy Vehicle (HOV) lane from approximately I-405 to near the floating bridge, and eastbound and westbound HOV facilities are under construction between I-405 and West Sammamish Parkway.

- **Interstate 90** is a major east-west interstate freeway connecting Seattle with East King County, and the primary route across the Cascade Mountains to eastern Washington and beyond. In the study area, I-90 is primarily a six-lane section, with additional center lanes between I-405 to I-5 functioning as reversible-direction HOV lanes.

- **Interstate 5** is the major north-south freeway connecting the west-coast states. In the Seattle area, I-5 is primarily an eight-lane facility, with a reversible express facility from Northgate to downtown Seattle. Interstate 5 has several segments through the study area with HOV lanes, but the system is not continuous throughout the study area.

- **Interstate 405** is a north-south freeway around the east side of Lake Washington, with a north terminus at I-5 in Snohomish County and a south terminus at I-5 in Tukwila. The freeway is primarily a six-lane section in most locations, but with an eight-lane section between Bellevue and Kirkland; there are HOV lanes on I-405 throughout the study area.

The Trans-Lake study area transportation conditions are also shaped by a wide range of other transportation facilities, services and programs, although all of them function or connect with the major corridors named above. Other major elements of the system considered in the study are transit (including local and regional transit facilities), transportation demand management (TDM) programs, and non-motorized transportation facilities. Chapter 2 provides more detail about these elements, and they have been further described in the Inventory of Existing Conditions Information Report.

1.2 Planning Context

The Trans-Lake Washington Study area is part of a larger urbanized area that includes King County, more than 30 local governments, and the adjacent Pierce and Snohomish counties. Travel in the region has increased significantly over the past several decades, exceeding the rate of population growth, which has grown by 16 percent since 1990. The current transportation system is recognized as one of the nation's most congested.

The strategy for improving the region's transportation system is a result of several decades of comprehensive planning efforts within the Puget Sound region. Transportation decisions are made within a larger context of growth management, economic development, environmental, and "quality of life" goals. The major elements of the region's transportation system have been in place for many decades. In most cases, they were developed before the National Environmental Policy Act (NEPA) of 1969 and the State Environmental Policy Act (SEPA) of 1971.

All of the projects recently implemented in this region resulted from an array of federal, state, and local partnerships. Each project fits within an established regulatory and regional planning framework. They each have featured extensive public planning and outreach, backed by detailed environmental and engineering studies. As is common throughout the country, the Puget Sound region's highway improvement projects have primarily focused on expanding and completing the HOV system. Most of the remaining highway projects involve interchange improvements, and enhancements to safety, operational and environmental performance. Very few recent projects at the regional scale have involved general-purpose capacity improvements.

1.2.1 Federal and State Policy

Below is a brief summary of some of the major state and federal regulations and legislation that influence transportation planning decisions in the Puget Sound region.

1.2.1.1 ISTEA and TEA-21

The federal Intermodal Surface Transportation Efficiency Act (ISTEA of 1991) greatly increased the degree of funding that was available for transportation improvements. It also focused on improvements that enhanced the overall function of the system and considered a range of modes, including transit and non-motorized travel. ISTEA strengthened the role of local governments in coordinating transportation and growth management through regional metropolitan planning organizations (MPOs). The Puget Sound Regional Council (PSRC) is the Puget Sound region's MPO.

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in July 1998. It establishes federal transportation programs and policies that essentially extend the initiatives of ISTEA for the next six years, through 2004. TEA-21 calls for and provides funding to transportation investments that link all forms of transportation, improve public transportation systems and services, provide better access to seaports and airports, and enhance efficient operation of transportation facilities and services.

1.2.1.2 Clean Air Act of 1970 and Amendments

In Washington, all transportation plans and projects must conform to the State Implementation Plan (SIP) for air quality, which itself responds to the federal Clean Air Act (CAA). The criteria for conformity specifies that a transportation activity cannot: 1) cause or contribute to any violation of the federal air quality standards; 2) increase the frequency or severity of any existing violation of the standards; or 3) delay timely attainment of the standards.

1.2.1.3 Washington State Growth Management Act

The Washington State Growth Management Act (GMA) of 1990 requires the designation of UGBs and adoption of comprehensive plans by the region's counties and cities. Within the UGBs, adequate transportation systems must be provided to achieve population and employment targets established by the region.

1.2.1.4 Washington State Commute Trip Reduction Act

In 1991, the Washington State Legislature passed the Commute Trip Reduction Act (HB 1671), which requires that counties, cities, and towns implement a commute trip reduction plan for major employers. These plans must include goals to reduce single-occupant vehicle (SOV) commute trips and vehicle miles traveled per employee. Providing commute alternatives is essential to achieving the law's goals. In 1997, the legislature revised the laws for trip reduction goals and allowed more flexibility in meeting other CTR requirements. Major employers were given the following goals for reducing SOV rates: 15 percent by 1995, 20 percent by 1997, 25 percent by 1999, and 35 percent by 2005.

1.2.1.5 Washington's Transportation Plan 1997 to 2016

Washington's Transportation Plan (WTP) presents a 20-year vision for improvements to the state-owned and state-interest facilities and modes of transportation. The plan provides a comprehensive view of the transportation investments needed over the next 20 years to maintain our current systems, improve safety, provide mobility to a growing population, and keep our strong economy. This plan establishes 20-year funding targets for all transportation modes including state highways, state ferries, state airports, public transportation, inter-city passenger rail, freight rail, marine ports and navigation, and bicycle and pedestrian transportation. The WTP will be up-dated in spring 2001. Total needs identified in the Plan would cost nearly $107 billion. Revenues were forecasted to be $46 billion, given past trends.

1.2.1.6 The State Highway System Plan (SHSP)

The State Highway System Plan (SHSP) 1999 to 2018 addresses the state highway system and acts as the highway element of the state transportation plan. It provides prioritized project improvement lists for mobility, HOV, safety, and other highway projects. The current SHSP was adopted by the Transportation Commission in December 1997. The estimated cost for needs identified in the SHSP is nearly $41 billion, while revenues over the same period are projected to be $18.3, based on past trends.

1.2.2 Regional Plans and Policies

A linked set of regional plans define the Puget Sound region's comprehensive vision for growth and transportation in the tri-county metropolitan area (Pierce, King, and Snohomish counties). Future regional development and growth is focused on compact communities and centers, which will be linked by an effective high-capacity transportation system (HOV, transit, ferries). The regional policy links development patterns and transportation system decisions, with transportation investments focused on maintaining and managing existing systems and goods. The regional policy seeks to achieve greater system efficiency and effectiveness by focusing on moving more people and goods, rather than more vehicles. It assumes a regional commitment to system management and demand management approaches which shift travel demand from

SOVs to more efficient modes of travel such as transit, carpools, vanpools, bicycles, and pedestrian travel.

1.2.2.1 Vision 2020

Vision 2020 is the long-range growth management, economic, and transportation strategy for the central Puget Sound Region. First adopted in 1990, Vision 2020 guides comprehensive-planning efforts in an area encompassing King, Pierce, Kitsap, and Snohomish counties. It articulates a growth management vision based on an interlinked approach for transportation investments and programs, with land use and economic strategies. "The vision is for diverse, economically and environmentally healthy communities, framed by open space, and connected by a high-quality multimodal transportation system that provides for effective mobility for people and goods" (Vision 2020 1995 Update, PSRC).

1.2.2.2 Metropolitan Transportation Plan

The Metropolitan Transportation Plan (MTP), a key component of Vision 2020, is a detailed long-range plan for future transportation investments in the central Puget Sound region. The MTP responds both to legislative mandates and to regional concerns about current and future transportation problems. The MTP builds on Vision 2020, as adopted in 1990 and amended in 1993 and 1995. The MTP was adopted in 1995, amended in 1998, and will again be updated in 2001.

The projects included in the MTP in 1995 provided a starting context for the Trans-Lake Washington Study by allowing committee members to understand what Trans-Lake transportation conditions would be like by 2020, given the MTP's level of investment. Cost is the most significant factor that is affecting both the past MTP project lists and future updates or revisions. The MTP is required to adopt a "fiscally constrained" approach.

1.2.2.3 *Sound Move* Regional Transit System Plan

Sound Move, the 10-year Regional Transit System Plan adopted by voters in 1996, is the Central Puget Sound Regional Transit Authority's (Sound Transit, formerly RTA) first step toward a long-range regional high-capacity transit system. The first phase of transportation improvements in the plan will expand the capacity of the region's major transportation corridors by adding new high-capacity transportation services and facilities over a 10-year period. *Sound Move* includes a mix of transportation improvements for regional express bus, commuter rail and light rail services. In the initial phase, Trans-Lake travel will be served by regional express bus services, and may include operational changes to the I-90 center roadway. Direct access HOV improvements are also included in several locations in the study area, including Mercer Island, Bellevue, and Kirkland. Sound Transit's long-range vision is for rail service between Seattle and the Eastside, which will be considered as part of Sound Transit's Phase II planning process.

1.2.2.4 Other Transportation Plans and Programs

Existing studies and projects in the Trans-Lake Washington study area include an array of regional and sub-regional plans, corridor studies, and specific actions or programs. The Inventory of Existing Conditions Information Report (November 1998) includes a summary review of existing plans and programs. The Trans-Lake Washington Study was conducted in recognition of many other transportation initiatives that are occurring in the

region. These include the SHSP and Sound Transit's Regional Transit System Plan, described above, as well as sub-regional plans such as the Eastside Transportation Partnership, local Comprehensive Plans, and the City of Seattle's Transportation Strategic Plan. All of these plans have strong policy sections intended to shape transportation in the region. Most of the plans also include specific project implementation lists, usually segregated into funded and non-funded categories. In general, all of these plans mention the need for a multimodal solution that will improve transportation across Lake Washington.

Additional sub-area and corridor studies affecting the Trans-Lake Washington study area include the I-405 Corridor Program, East King County Corridor Needs Study, SR 522 Multimodal Project (all conducted by WSDOT); the Bellevue-Redmond-Overlake Transportation Study (BROTS), Seattle Neighborhood Traffic Studies, and Points Communities Traffic Studies. All of these efforts focus on a specific corridor or sub-area location.

Specific project actions within the Trans-Lake Washington Study area include the Kirkland and Mercer Island HOV direct access transit center projects, Downtown Bellevue Access Study, SR 520/NE 40th Street Interchange, SR 520/Bel-Red Access Study, and the City of Kirkland Burlington Northern Santa Fe (BNSF) Trail.

1.2.2.5 Trans-Lake and Other East-West Corridor Projects

A number of past and future projects shape the nature of the major east-west highways, as well as the planning environment, that form the basis for the Trans-Lake Washington Study. These include the development of the SR 520 corridor, changes to the I-90 corridor, and plans for the SR 522 corridor.

SR 520/Evergreen Point Floating Bridge – The SR 520 bridge was completed in 1962. The bridge includes segments on pontoons (the "floating bridge") as well as segments on piers (the east and west approaches, including a western high-rise section and the crossings through the Arboretum Area). To establish baseline assumptions regarding the Evergreen Point Floating Bridge for the Trans-Lake Washington Study, two working sessions were conducted with representatives from WSDOT. Papers on the bridge condition and plans were provided to the committee and are documented in Appendix 4.

At the time of the Trans-Lake Washington Study, WSDOT was spending $16 million to strengthen the pontoons and perform seismic improvements to the approaches to the floating bridge. Including the $16 million contract, a total of $26 million has been spent since 1995 on rehabilitation. Work was estimated to be completed in September 1999. Combined with prior rehabilitation, the work will strengthen the structure to withstand a 20-year storm event (77 mph wind velocity) on Lake Washington. These efforts to strengthen and preserve the bridge were developed after several previous storms damaged the floating bridge pontoons and anchor cables.

An expert review panel advised WSDOT that the floating portion of the Evergreen Point Floating Bridge will have an estimated service life (i.e., life expectancy) of 20 to 25 years following completion of this bridge strengthening project. They also advised that there are no feasible actions to further extend the life of the bridge beyond the estimated 20- to 25-year service life, or to strengthen the existing bridge to withstand greater than a 20-year storm event without sustaining damage. This is primarily due to the fact that more is known today about the specific weather conditions affecting the floating bridge

than was known at the time it was designed. According to the expert panel, the current strengthening efforts will essentially maximize the service life of the bridge.

The estimated service life could be reduced if the bridge experiences wind speeds above 50 mph several times over a number of years. During the Trans-Lake Washington Study, mechanical portions of the bridge were damaged during a storm nearly this magnitude. If the bridge experienced a 100-year storm event (92 mph wind velocity), it is highly likely that the bridge would be damaged beyond repair. Storms with a 20- to 50-year recurrence interval would damage the bridge. However, with this level of storm it is likely that the bridge could be repaired and reopened to traffic with some reduction in estimated service life.

According to WSDOT Bridge Engineers, the existing bridge is supporting the maximum weight it can handle, and it cannot be modified to accept additional weight or widening.

The I-90 Parallel Span Project (1989) – The state's largest recent highway improvement project was the development of the I-90 parallel span across Lake Washington, which involved the renovation or replacement of much of the previously existing freeway facility between I-405 and I-90. Although the planning process for I-90 was focused on one specific corridor, it has served as both a precedent and a model for many of the region's subsequent major transportation planning efforts, including the Trans-Lake Washington Study.

The parallel span of I-90 was opened in 1989, and was one of the most expensive highway improvement projects in the nation. The record costs for I-90 reflected the unique physical, environmental and operational constraints that had to be addressed within a relatively short stretch of highway. Affected community groups and jurisdictions were highly involved in the project's development, helping to determine many of its key features and some of its long- and short-term operational characteristics. A number of major mitigation and enhancement elements to the project, including lid structures, and various recreational, community, and landscape improvements, were required for all parties to reach agreement following a period of extensive litigation.

I-90 Center Roadway Conversion Project – While the Trans-Lake Washington Study was being conducted, Sound Transit was conducting a study of operational changes to the I-90 reversible center roadway, linked to regional express bus services contained in *Sound Move*. The study focusing on I-90 examined alternative operation scenarios for the existing reversible direction HOV facility between Bellevue and Seattle. These changes were considered necessary to reduce travel times for regional express and local buses, and provide a reliable route at all times in each direction. In connection to the center roadway changes, a new transit station will be provided in downtown Mercer Island near I-90 to serve regional and local bus transit. Long-range plans call for the center roadway to be used for rail transit. Study results were expected to be available by early 2000, but were not yet completed at the time of the Trans-Lake Washington Study.

1.2.2.6 SR 522 Multimodal Project

A variety of multimodal improvements were being considered for the SR 522 corridor while the Trans-Lake Washington Study was being conducted. The SR 522 Study, which was managed by the WSDOT Office of Urban Mobility, was intended to define cost-effective, publicly accepted multimodal mobility and safety solutions along the arterial. It examined solutions on a longer range, corridor-wide basis, although several segments

of the corridor have HOV or bus-transit improvement projects that are already being implemented. The SR 522 Study featured a Steering Study Committee that included some of the same representatives who served on the Trans-Lake Washington Study Committee.

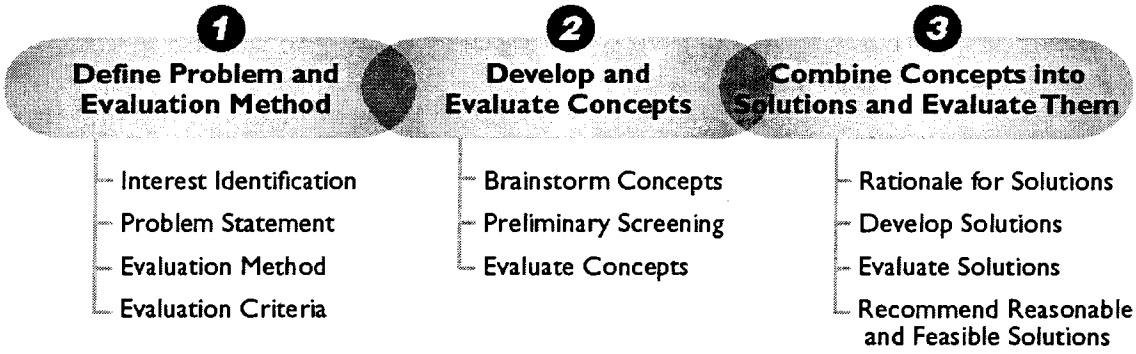
1.3 The Trans-Lake Washington Study Process

The course of the Trans-Lake Washington Study was strongly influenced by the interests of the Study Committee members, and by the requests and directions they provided to the project study team. Through the 14-month course of the study, the committee members participated in a tour of the study area, and attended nearly 20 multi-hour meetings and workshops. At all stages of the study process, project staff were asked to provide additional information or analysis on subjects such as transportation forecasting methods, highway operations, bridge and tunnel construction methods, rail transit planning, demand management, and transportation finance. Representatives from other involved agencies and staff from other projects were also asked to make presentations before the committee. A number of additional committee-initiated workgroups also emerged with interests in issues such as land use planning strategies, and neighborhood and environmental enhancement approaches.

1.3.1 The Study in Three Stages

The committee members used a three-step process to identify and evaluate a set of solutions with the potential to improve mobility across or around Lake Washington. The process focused on three steps, as shown in the Figure 1-2.

Figure 1-2. Study Process



1. **Define Problem and Evaluation Method** – This initial step focused on defining the problem the Trans-Lake Washington Study was intended to address. The problem statement set key parameters for the study, and provided the basis for criteria committee members could use to assess potential solutions. Through brainstorming efforts and outreach to the parties they represented, committee members developed a list of issues and concerns, and then developed a statement of the problem. The text of the problem statement is shown in Exhibit 1-1.

Exhibit 1-1

Committee's Working Draft Problem Statement

November 5, 1998

The Purpose of the Trans-Lake Washington Study is to identify a set of short and long term "reasonable and feasible solutions" to improve mobility across and around Lake Washington. Our focus is on transportation as a means of access for residents to employment, housing and activities, and for businesses to move their products and provide their services efficiently and reliably while minimizing and mitigating impacts and, where possible, enhancing the quality of our neighborhoods, our region, and our environment. Transportation is inextricably linked with land use, patterns of growth, and environmental quality.

Problem Statement:

Land Uses and Transportation Systems Are Not Integrated In Their Planning and Implementation

The evolution of our transportation system has not kept pace with rapid job and residential growth. Neither transit development, demand management programs, roadway capacity additions, nor financing systems have been sufficient to keep pace with the trips generated by this growing population. Adopted local and regional growth management and transportation plans and policies are tending to concentrate and integrate residential and employment patterns more than in the past, partly in an effort to ease burdens on the transportation system. However, significant infrastructure investments, transit service, and demand management policies also called for by those plans have only been partially implemented. Infill has placed greater burdens on the existing system. Given this context, congestion levels in the Trans-lake Study area are projected to get worse in the next ten to twenty years.

The Transportation System Suffers from Extensive Congestion

Vehicle miles traveled have been growing as fast or faster than the population. During much of the day, and especially at peak commute periods, highway lanes across and around the north end of Lake Washington and routes feeding those trans-lake facilities are heavily congested. When congestion occurs on trans-lake routes, it backs up onto major north-south corridors and adjacent arterials, congesting those routes as well. Those users dependent on these routes for safe, regional travel and the movement of freight and goods, experience travel delays, lack of predictability, and a corresponding loss of economic productivity and overall quality of life.

Reliability and Safety of the System Are Impaired

The state highway, arterial, and local street systems around and adjacent to the lake are vulnerable to incident-caused back-ups. Minor incidents generate significant delays throughout the entire system; more significant incidents cause near gridlock conditions as vehicles avoid a blocked route only to crowd others. Conflict between regional and local traffic, lack of adequate alternative modes, linkages to the rest of the system, weave patterns near interchanges, and substandard HOV lanes and/or the lack of shoulders also contribute to this unreliability and to a reduction in safety. A longer-term issue affecting system reliability and safety is the structural condition of the pontoon section of the Evergreen Point Floating Bridge. Where HOV lanes, metering or preferential treatment are not present, transit and carpool users are delayed by traffic congestion in general purpose lanes, reducing the effectiveness of existing transit and ridesharing services. For those desiring pedestrian or bicycle travel the system is incomplete, making those options either impossible or unsafe.

Neighborhoods, Business Centers and the Environment are Impacted

The livability of neighborhoods, and the access to local arterials and smaller residential streets in the vicinity of cross-lake routes, are negatively impacted by high traffic volumes. A lack of adequate mitigation results in "cut-through" traffic, noise, vibration, air pollution, dust and restricted access for local residents and local businesses. Walking and bicycling are made less safe and less enjoyable. Considerable land is consumed and some neighborhoods are effectively divided. Vehicle emissions negatively impact air and water quality throughout the region.

Four major themes emerged in the committee's statement:

- Land use and transportation systems are not integrated in their planning and implementation
- The transportation system suffers from extensive congestion
- Reliability and safety of the system are impaired
- Neighborhoods, business centers, and the environment are impaired

During this phase of the process, project staff were asked to develop an evaluation approach that reflected the themes of the problem statement, and the underlying interests of the committee members. The evaluation approach provided three categories of measures: 1) transportation effectiveness, 2) environmental impacts, and 3) costs. (More detail on the methods and criteria that were applied is provided in Chapter 4, Solution Development and Evaluation.)

2. **Develop and Evaluate Concepts** – The second step of the process focused on developing specific ideas for resolving Trans-Lake study area problems. Committee members provided suggestions to improve transportation system performance and minimize environmental impacts. The suggestions were synthesized by project staff into concepts, and then reviewed by committee members. The suggested concepts (a partial list is provided in Figures 4-1 through 4-3, with a full listing in Appendix 1) covered a wide range of locations, modes and strategies. Project staff reviewed the potential performance of the suggested concepts, and provided the results and recommendations to the committee members.

3. **Develop and Refine Solution Sets** – Committee members used the results of the concept evaluation to develop potential solution sets, which they organized according to a series of strategic themes. Each strategy represented a possible approach to addressing Trans-Lake problems. Committee members ultimately confirmed six solution sets for evaluation, in addition to a No Action strategy. (The Solution Sets are described in Chapter 4.) All of the solution sets shared a system-wide perspective that did not depend upon a single mode, location or approach. Following the selection of the draft solution sets, project staff evaluated their performance, providing results on nearly 50 measures covering transportation effectiveness, environmental impacts and costs. The summary results of the solution evaluations are provided in Chapter 5.

1.3.2 Study Committee Process

The Trans-Lake Washington Study Committee was constituted by WSDOT in early 1998 to provide advice to address problems related to mobility and community impacts across and around Lake Washington. The communities and jurisdictions agreed to an inclusive, informal community process to examine alternatives for addressing Trans-Lake problems throughout a broad area stretching from I-90 north to SR 522, and from I-5 east to the end of SR 520.

WSDOT worked with agencies and interest groups in the study area to identify a 47-person Study Committee whose members would represent the interests of elected officials, public agencies, corridor interest groups, neighborhoods, and regional interest groups. Each representative was appointed by their immediate constituency. The participants were asked to work together to define a set of reasonable and feasible solutions to address growing congestion, development, and transportation impacts on communities.

WSDOT selected an independent, neutral facilitation team to work with the committee to develop and implement a cooperative decision-making process. The facilitation team interviewed as many of the committee members as possible prior to the first Study Committee meeting, and continued to serve as a point of communication with committee members throughout the 14-month Study Committee process. During that time, the committee met 17 times in full session, and participated in a tour of the study area, an all-day background information workshop, a special session on capacity issues, and numerous informal working sessions. In the end, the Study Committee developed an integrated set of findings and recommendations that addressed all elements of the committee's problem statement. To reach those recommendations, the committee worked through this sequence of learning and discussion:

May 27, 1998 – Study Committee heard its charge from Sid Morrison, Secretary of the Department of Transportation, to agree on a set of reasonable and feasible solutions that will address the growing congestion, population and development, and transportation impacts on communities. The committee discussed a proposed approach or "roadmap" for their work, and identified problems and interests relevant to their constituencies.

July 1, 1998 – "Trans-Lake Transportation 101" presented historical perspective, system overview, and future growth projections. Topics of needed information were identified, and the committee discussed proposals for public involvement, committee ground rules, and the elements of a problem statement.

August 5, 1998 – Study Committee heard proposed draft problem statement, and an assessment of current conditions in Trans-Lake corridors. Committee discussed potential evaluation methodology and criteria for alternative solutions, agreed on a proposed general approach, and considered committee leadership issues. Ground rules were accepted.

September 2, 1998 – Committee considered leadership options and retained committee-of-the-whole status, retaining right to revisit. Reviewed draft problem statement and agreed to share it with the public at workshops. Learned about transportation modeling process, and proposed evaluation methodology for solutions to include effectiveness, impacts, and cost. Committee brainstormed potential concepts in transit, roadway, land use, TDM/transportation system management (TSM), and enhancements to address Trans-Lake problems.

September 30, 1998 – Special background workshop on transportation and land use linkages, transit, enhancements, roadway improvements, and TDM. Featured case study of Portland-area Land Use, Transportation and Air Quality (LUTRAQ) process.

October 7, 1998 – Committee heard reports on public workshops, and suggestions for changing problem statement based on public input. Reviewed potential concepts for addressing problems and focused on work program to fill in gaps and evaluate alternative solutions.

November 4, 1998 – Problem statement adopted to guide Study Committee's identification of potential solutions. Reviewed most workable concepts and discussed which ones were potential building blocks to system-level solutions. Committee understood the MTP and discussed implications for Trans-Lake Study. Potential strategies for addressing Trans-Lake problems were identified and discussed.

November 18, 1988 – In work groups, the committee reviewed and refined strategic approaches and selected concepts they felt would support the strategic goals of the Trans-Lake Washington Study.

January 6, 1999 – Technical team provided potential solution packages based on concepts and strategies discussed by the committee. Committee provided feedback on several solutions, and discussed additional technical information and modeling needed to evaluate.

February 3, 1999 – Study Committee reviewed plans to proceed with origin/destination survey to better understand traffic movement and validate modeling results. Sufficient interest existed within the committee to proceed with an origin and destination study. Options for incorporating TDM and land use into potential solutions were beginning to be discussed in informal between-meeting sessions. Study Committee reviewed potential solution sets, which were based on the MTP and No Action alternatives. Information was also provided on capacity issues on I-5, potential results of a new "county-line" freeway north of Lake Washington, and potential new corridors in the general area of Kirkland to Sand Point. Ridership numbers on two rail lines across the lake were not encouraging. The ongoing improvement project on SR 522 was described, as well as Sound Transit's planning for I-90 transit lane and HOV changes. Proposed public involvement activities included focus groups, public opinion polling, and additional public workshops.

March 3, 1999 – The Study Committee reviewed a comparison approach for evaluating potential solutions, and continued discussion and refinement of solution packages. Analyses of passenger or bus ferries from Kirkland to Seattle, and the possibility of underwater tunnels or tubes from Kirkland to Sand Point, were provided and discussed. The group discussed a refined decision process to seek consensus on final recommendations, affirming its commitment to seek consensus or broad support, and establishing a fallback super-majority voting procedure. Availability of the project team to make presentations on the Trans-Lake Study to community organizations was reiterated in a mailing.

March 24, 1999 – Approaches for incorporating TDM and enhancements and mitigation into potential solutions were presented and discussed. Further definition of the potential solutions to be modeled in detail was provided. The technical team confirmed how it would present information from the evaluation of the potential solutions.

April 28, 1999 – Study Session on relationships between capacity and congestion. Members held an informal discussion session on the pros and cons of adding capacity in the Trans-Lake study area.

May 5, 1999 – Technical team briefed committee on preliminary results of solution evaluations in the environmental impact area. Committee members identified potential issues that would require mitigation in the study area neighborhoods, and gave the technical team feedback to allow it to examine effectiveness, performance, and cost of potential mitigation concepts. The group agreed on the consensus/broad support/super-majority model for final decision-making.

May 21, 1999 – Technical team provided preliminary evaluation results for potential solutions, including effectiveness, impacts, and cost of several alternatives, and assessment of how they would affect transit and traffic operations. Remaining evaluation questions were identified, and the group discussed how the solutions would be analyzed to form the basis for recommendations.

June 2, 1999 – The Study Committee heard additional analysis results, including sensitivity tests for HOV/transit lanes and transportation pricing options. Implications of the various solutions for operations on the SR 520 and I-5 systems were also discussed, as were rail operational issues. A range of options for transit technologies and operations were identified, and the group understood the assumptions being used in the evaluation. Results of public meetings and public reaction to potential solutions under consideration were summarized for committee members. The technical team provided additional concepts for mitigating environmental impacts.

June 10, 1999 – Preliminary results of the origin/destination study provided further understanding of traffic behavior in the study area, and results of the community survey addressed several of the potential improvements being considered by the committee. Members discussed which of the ideas from the analyses appeared to be promising for the recommendations, and members presented goals and principles, options for recommendations, and approaches to be included in the recommended solutions.

June 16, 1999 – The Study Committee continued its progress toward agreement on elements of the solutions that would be part of final committee recommendations, with associated mitigation and enhancement options.

June 30, 1999 – Draft recommendations were discussed, including corridor recommendations, the Kirkland-Sand Point corridor, TDM and TSM, mitigation and enhancement, and early actions to address near-term problems. The committee progressed toward agreement on draft recommendations, identify remaining issues requiring resolution. .

July 16, 1999 – The Study Committee reached agreement on a set of findings and recommendations, including a discussion of study background, the problem statement, and guiding principles for the committee. Specific recommendations were defined for community enhancement and mitigation, SR 522, the Kirkland/Sand Point corridor, SR 520, I-90, high-capacity transit, and TDM/TSM. The committee concluded with strong recognition of linkages between transportation decisions and effective growth management, supporting strong interconnected urban centers, a healthy environment, a strong economy, and a firm UGB. A set of recommended early actions were included as

an attachment. A total of 44 members affirmed the recommendations by signing them; three members were not able to support the package of recommendations for a variety of reasons.

1.3.3 Study Committee Findings and Recommendations

The Trans-Lake Washington Study Committee finalized its recommendations on July 16, 1999 and the full text is provided in Exhibit 1-2. The committee's recommendations included a listing of actions that could provide additional capacity, improve the reliability of the transportation system, reduce demand for highway travel, and reduce the impacts of transportation facilities. In making its recommendations, the committee had a considerable amount of information available on potential actions. Although they ultimately decided upon a combination of regional and corridor perspectives for their recommendations, the major actions recommended had previously been evaluated through the solution set evaluation process.

1.3.4 Major Technical Products of the Trans-Lake Study

As noted above, the study process allowed committee members to determine the scope of the study area, to investigate a range of related issues, and to develop and consider a wide array of potential solutions. To support the committee's work, project staff provided technical, facilitative, and process-related support throughout the 14-month study period. For instance, committee members frequently requested technical or "case study" information on a specific topic, such as bridge or tunnel technologies. At several stages, they asked project staff to propose specific approaches, tools, or methods to help them in their decision-making process. This included providing evaluation tools, designing workshops to focus on certain aspects of the solution sets, and revising and refining concepts or solutions to be considered. The major technical products that were prepared for the study are listed below, followed by a summary description of each.

- Problem Statement (8/98-11/98)
- Environmental Strategy: Conceptual Methodology (10/98)
- Draft Evaluation Approach and Criteria (8/98-10/98)
- Inventory of Existing Conditions Information (10/98)
- Concept Descriptions (10/98-11/98)
- Concept Assessments (11/98-12/98)
- Solution "Strategy" Development (12/98)
- Solution Set Descriptions (1/99-3/99)
- Solution Set Conceptual Engineering Definitions (3/99)
- Solution Set Evaluation Criteria & Methodology (3/99)
- Transportation Demand Management Strategy Discussion and Effectiveness Estimates
- Origin/Destination Survey
- Public Survey
- Open House and Public Meetings
- Solution Set Evaluations and Findings (5/99-6/99)

1.3.4.1 Problem Statement (8/98-11/98)

This document was a statement of problems, issues, and concerns to be addressed through the study. It was initially drafted by project staff, based on committee member interviews, and was substantially revised by committee members over several meetings. It described the study's physical areas, its purpose, and noted specific areas of transportation, environmental, and economic concerns. After several drafts and revisions, a "working draft" was used from November 1998 forward.

1.3.4.2 Environmental Strategy: Conceptual Methodology Report (10/98)

This document outlined environmental process options that the study could follow. It was provided for committee review and as a project planning guide for the technical team. Several subsequent process and technical steps were based on the document, including the overall three-step approach that the committee used to develop its recommendations.

1.3.4.3 Draft Evaluation Approach and Criteria

In response to committee requests, staff proposed a two-tiered approach for reviewing the performance, impacts, costs of concepts and solution sets. The approach proposed that concepts receive a summary assessment, while solution sets were to be evaluated in more detail. The proposed concepts would be compared against similar concepts for their likely performance in the areas of transportation effectiveness, environmental impacts, and potential costs. All ratings at the concept level were qualitative. More detailed measures for each of the categories would be developed for the solution sets, in consultation with the committee. The paper describing the approach was provided for committee review, and its suggested "first tier" assessments were applied during the concept development phase.

1.3.4.4 Inventory of Existing Conditions Information Technical Report (10/98)

This technical report reviewed available transportation, land use, and environmental information in the study area, including related plans, projects, and studies. It also described transportation system elements and conditions for Study committee reference. Most of the major elements of the report had already been provided in a presentation during the first several months of the study.

1.3.4.5 Concept Descriptions (10/98)

This set of packages documented the results of committee and public brainstorming on possible projects and strategies. The concepts were further defined and described by technical staff, provided with identifiers, and arranged by category (transit, roadway, TDM and land use, enhancements). The steps to develop the concepts were documented in meeting packages and were reviewed and discussed over several Study committee meetings from October through November.

1.3.4.6 Concept Assessments (12/98)

This report provided the results of the technical team review of proposed concepts. The review was based on existing information about the study area, and on professional staff experience with planning, engineering, and environmental issues. The report provided Concept Descriptions, 1 to 5 scale ratings in three general areas (effectiveness, impacts, and cost), a brief narrative of findings, and staff recommendations for next actions.

1.3.4.7 Solution "Strategy" Development (12/98)

This combination of worksheets and meeting summaries included the results of a committee member exercise for developing "framework" approaches to potential solution sets. The committee members identified strategies and suggested likely concepts to be included. Ten approaches were suggested, several with suboptions. Committee members then requested additional assistance and refinement by the technical team to help further develop potential solution sets.

1.3.4.8 Solution Set Descriptions (1/99-3/99)

In response to the "strategies" workshops above, staff developed 10 "solution sets" containing groupings of projects, TDM approaches, and other actions based on the strategies suggested by the committee. The result was a narrative description of the modal elements for each solution set, along with a general mapping of the projects that might be considered. The solution sets included a set based on the 1995 MTP. The draft solution sets were reviewed and refined over several meetings, and several options for solution sets were consolidated or removed. During this time, the longer narratives were replaced with simpler mapped illustrations, along with conceptual design drawings.

During the refinements of the solution sets, one concept, a proposed new roadway project, was removed from consideration in this study. The new "County Line" freeway was removed after committee discussion, which was informed by preliminary travel forecasts that revealed a new freeway at the north end of the study area would not substantially contribute to improved travel conditions on SR 520 and I-90. During the earlier concept screening stages, the "County Line" freeway concept had received low scores for impacts and costs, largely because of the new right-of-way that would be required in an already developed area.

Also during the solution set refinements, several multimodal solution sets were combined. The multimodal solution sets had been based on similar committee-suggested strategies, and they slightly differed in their approach to light rail routing. They otherwise duplicated projects or strategies that were already being considered in other solution sets.

1.3.4.9 Solution Set Conceptual Engineering Definitions (3/98)

After committee members had confirmed the general elements of the solution sets they wished to see evaluated, staff prepared conceptual engineering definitions of specific projects or corridor treatments. Committee members were advised that these definitions would be "sample" conceptual designs, and that design features could vary with more detailed engineering study. However, the definitions as drafted would be appropriate to indicate the likely effectiveness, cost and environmental impacts of the potential actions. Along with the conceptual design drawings, staff provided brief descriptions of details such as operating characteristics, right-of-way required, and routes and profiles.

1.3.4.10 Transportation Demand Management Strategy Discussion and Effectiveness Estimates (3/99)

In response to the strong interest of study committee members, project staff provided a paper that provided further detail on the components and estimated effectiveness of an MTP-based TDM program, and for the No Action and Maximize Alternatives programs. The committee members were advised that the model would predict the results of these programs, but it would use surrogate factors like travel time and travel cost to forecast

their results; the surrogate factors were presented to the committee in the paper and in presentation.

1.3.4.11 Origin/Destination Survey (5/99)

The project team completed this survey at the direction of the committee members, who were concerned that existing forecasting tools did not accurately reflect recent trends in employment and land use involving Trans-lake travel. The survey was conducted in May 1999, and its results were provided to the committee in a report and presentation in May and June. Origin/destination data and other travel characteristics, habits and opinions were covered in the poll.

1.3.4.12 Public Survey (5/99)

A random telephone survey was conducted in May 1999 to assess community perspectives on Trans-Lake problems and the various strategies and improvements that were being considered in the study. The results of the study were provided in a report and presentation in June.

1.3.4.13 Open Houses and Public Meetings (Fall 1998 and May/June 1999)

A first round of public workshops was held in the fall, as the study's problem statement was being developed and the committee was developing potential actions and strategies for consideration. The second set occurred in May and June, as the committee was considering the seven solution sets. Summarized results of the evaluations were provided to the public at that time. Through staff presentations, committee members were advised of the responses and comments of the public from both rounds of the workshops.

1.3.4.14 Solution Set Evaluation Criteria and Methodology (3/99)

This document provided committee members with an explanation of the categories of criteria that would be applied to their solution sets, along with a description of each of the measures that would be used. A "report template" was also developed to show committee members how the information would be organized by solution set. The criteria used were based on the interests and concerns that committee members had identified earlier in the study process, and they were also designed to indicate potential performance in topic areas that would typically be examined in more detailed environmental study. Over the course of several meetings, the document was revised in response to comments from the committee and other agency staff. None of the measures were "weighted", and they did not include cost-effectiveness measures. The criteria were provided to inform committee decision-making and to allow further discussion, and they did not establish threshold values that would eliminate specific actions or strategies from consideration.

1.3.4.15 Solution Set Evaluation Results (5/99)

The committee was provided with complete packages that evaluated the seven solution sets, with nearly 150 measures provided for each solution, as measured at the corridor and system-wide level. Using the templates described above, along with a narrative summary of the findings for each solution set, committee members received the results of travel forecasts, traffic engineering analysis, environmental analysis, and cost estimation. At committee request, additional "sensitivity test" exercises were later performed by technical staff to predict how specific elements or corridor actions might perform on an individual basis. Over two meetings, staff made presentations to the committee focusing on the evaluation results by category.

Exhibit 1-2

Study Committee Findings and Recommendations

Background

The Trans-Lake Washington Study Committee was appointed by Secretary of Transportation, Sid Morrison, in May of 1998 to recommend a set of reasonable and feasible solutions to improve mobility across and around the north end of Lake Washington. The 47-person Study Committee has represented local governments and state and regional agencies, as well as neighborhood, business and advocacy interests within the Trans-Lake corridor.

Over a 14-month period, the Trans-Lake Washington Study Committee has agreed on a problem statement and has developed and evaluated alternative mobility concepts across a full range of transportation solutions. The Study Committee now recommends an array of Trans-Lake alternative solutions to be carried forward to a formal environmental impact study.

Given that our recommendations extend beyond the highway system and include other modes of travel, we further recommend that the EIS be conducted under the aegis of the Washington State Department of Transportation as well as other governmental bodies with jurisdiction over the proposals included in this report.

Problem Statement

The Study Committee has identified four problems that Trans-Lake solutions should address; each exists today and will become more critical in the future:

1. Land use and transportation systems are not integrated in their planning and implementation,

2. The transportation system suffers from extensive congestion,

3. Reliability and safety of the system are impaired, and

4. Neighborhoods, business centers and the environment are impacted.

Guiding Principles

The Committee believes that several guiding principles apply to all of our recommendations:

- Integration of the urban areas is essential and future actions should build on the positive inter-relationships among the communities adjacent to the Trans-Lake corridors.
- Balance is needed among modes, corridors, and systems.
- There must be high standards of performance and superior quality of work on any project, program, or design, including environmental and other enhancements and mitigation.
- Options recommended should provide viable transportation choices and increase the choices among those.
- In our urban areas adjacent to the Trans-Lake study, any proposals should accommodate new jobs, growth, and individual and community prosperity.
- Many recommendations will require extensive study and time before implementation. All actions, including early actions (see attachment), should be examined to facilitate swift and appropriate implementation.

- There needs to be much more extensive engagement of the public and affected community input through the early actions, the EIS process and the choice of preferred alternatives, project design, preliminary engineering, and project implementation.
- More complete EIS analysis of potential actions to address the stated problems is required before recommending the preferred set of actions. The EIS should clearly state assumptions for the transportation modeling.
- In parallel with the EIS, we also recommend identifying potential funding sources for implementing each option.
- Whatever decision moves forward should be sufficiently flexible to accommodate new ideas and technologies.
- There should be consideration of broader economic and urban development impacts of options evaluated, including, but not limited to: the relationship of urban mobility to the growth of population and employment; socioeconomic impacts of changes to local and regional commute patterns, modes, durations and distance; impacts on employment opportuni-ties; and land use.
- The evaluation should identify the consequences of finding/not finding a way to either: a) accommodate; b) encourage the elimination or diversion of; or c) provide feasible alternatives to forecasted demand for Trans-Lake travel.

Recommendations

One clear conclusion of the Study Committee is that no single action, by itself, will provide an adequate response to these problems – several actions will be needed that together will provide additional capacity, improve the reliability of the transportation system, reduce demand for highway travel, and reduce impacts of transportation facilities on neighborhoods and the environment.

Recommendations for Community Enhancement and Mitigation

- Mitigation and enhancement must be integral to and inseparable from the proposed transportation improvements. Mitigation and enhancement should start with sensitive project design where potential impacts are minimized wherever possible. Project design and mitigation elements should potentially include lids, multiple-level structures, grade separation, tunnels and other significant treatments such as those which have been and will be suggested by the affected communities. Mitigation of impacts caused by existing transportation facilities must be considered along with new impacts. The magnitude of mitigation measures must be commensurate with the amount of impact caused by the action.
- An extensive and active involvement process to engage affected communities and regional interests, including local jurisdictions, neighborhoods, resource/regional economic development agencies, and employers, should be integral to the EIS and design and construction process to identify near-term and longer-term impacts, community objectives, and mitigations and enhancements that will accompany any mobility improvement.
- The transportation alternatives developed should be designed to avoid or minimize identified impacts. The following issues have been identified as being particularly significant in the Trans-Lake study area:
  - Noise and vibration
  - Transportation corridor widening, especially if it will result in displacements or encroachments
  - Impact to intersecting freeways
  - Impacts on arterial access routes that impede local circulation and other neighborhood functions
  - Cut-through traffic using local streets to avoid freeway congestion
  - Visual impacts
  - Water quantity and quality impacts

- Air quality impacts
- Impacts to endangered species
- Impacts to sensitive areas, parks, and historic sites
- Consistency with local and regional growth management and economic plans
- Impacts to regional and sub-regional economic development and job creation and recruitment
- Transportation alternatives should enhance local communities by taking advantage of opportunities to:
- Implement objectives of local and regional plans
- Improve transportation safety and reliability
- Improve access and mobility for pedestrians and bicyclists
- Connect neighborhoods separated by transportation facilities
- Improve the visual appearance of transportation facilities
- Provide space for community-desired uses
- Enhance and preserve sensitive areas, parks, and historic sites
- Maintain a strong base of employment and enhance economic opportunities for individuals and communities
- Produce commute options that assure dependable and acceptable commute times

Recommendations for SR 522

- Transit lanes, signal priority, bicycle, pedestrian and safety improvements along SR 522, as called for by the SR 522 Multimodal Corridor study, and east-west connectors to and from I-5, as appropriate, should be implemented.

Recommendations for the Kirkland/Sand Point Corridor

- The committee has examined the possibility of a third Trans-Lake crossing from the Kirkland to Sand Point areas, but does not recommend that a new crossing be evaluated in the EIS.

- A separate study should be undertaken to analyze current and longer-term east-west travel demand north of Lake Washington. This study should accommodate emerging land uses to the north of the Lake, and include a focus on transit needs as well as acknowledging non-commute capacity needs.

- The Trans-Lake study showed that car or bus ferries would have significant impacts at loading points, and passenger-only ferries would not substantially enhance people-moving capacity. The committee recommends, however, that passenger ferry options across Lake Washington should be studied further, with emphasis on private operation.

Recommendations for the SR 520 Corridor

- Floating bridge pontoons must be replaced within their maximum remaining 25-year service life.

- Roadway shoulders and bicycle and pedestrian facilities should be considered as part of any new or replaced bridge crossing.

- The EIS should evaluate the following combinations of additional transportation elements in each direction on SR 520:
  - One HOV lane in each direction
  - One HOV lane in each direction and high-capacity transit
  - One HOV lane in each direction and one general purpose lane in each direction
  - One HOV lane in each direction, high-capacity transit, and one general purpose lane in each direction

- These combinations should be evaluated along with a No Action and a Minimum Footprint alternative. The Minimum Footprint alternative would include maintaining the existing four lanes while improving transit and HOV access to SR 520, bicycle/pedestrian access, and providing for a median barrier and minimum roadway shoulders while maintaining a minimal footprint.

- During the EIS process, each of these options should be more fully specified. Those specifications would identify where added lanes would begin and end, whether the SR 520 corridor is the best route for a cross-lake high-capacity transit route, whether and how I-5 and I-405 freeway interchanges to SR 520 should be modified, and whether and how arterial connections to SR 520 should be modified, added, or removed.

Recommendations for the I-90 Corridor

- There should be continued study of Sound Transit's proposal to establish 2-way HOV/transit operation on I-90. I-90 should remain convertible to include high-capacity transit in the future.

- Freight mobility in the I-90 corridor should be preserved and enhanced.

Recommendations for High-Capacity Transit

- Preference should be placed on high-capacity transit in the SR 520 corridor. In the event that technical constraints limit consideration of high-capacity transit as an integral SR 520 structural component, other alignments, including an exclusive right of way for high-capacity transit, should be considered. Provision of high-capacity transit will not eliminate the need for other Trans-Lake improvements, and implementation of high-capacity transit should not result in reduced Trans-Lake HOV capacity overall.

Recommendations for Transportation Demand Management and Transportation System Management

- Transportation Demand Management (TDM) measures that build and expand on the region's considerable commitment and success in commute trip reduction programs should be analyzed in any environmental impact analysis. The analysis should assess the impact of committing substantial resources toward TDM measures. The analysis should include both land use actions and effective trip reduction measures, while enhancing commercial traffic mobility. A list of potential TDM measures to be considered is included in the committee's technical report.

- Inter-local corridor agreements should be developed and enhanced to implement TDM and Transportation System Management (TSM) measures. Such inter-local agreements should include trip reduction goals with milestones and monitoring plans, and funding to prepare and monitor implementation of trip reduction plans. These recommendations anticipate cooperative leveraging of WSDOT and non-WSDOT funds, with involvement of local and regional jurisdictions. They also encourage providing public incentives for implementing TDM, to be carried out by the public and/or private sectors.

- TSM actions, which are defined as improvements to transportation systems, including arterials, that improve speed, reliability, access, and traveler information, should be analyzed. Measures that could be implemented in the short term and/or at low and moderate cost should be identified and implemented as rapidly as possible. (Some examples of potential early actions that have been suggested by members of the Study Committee are included as an attachment.)

- How we price transportation should be further studied on a regional, rather than on a corridor basis, consistent with the Puget Sound Regional Council's Pricing Task Force.

Conclusion

The 14-month Trans-Lake Washington Study process, which brought 47 community representatives (and nearly as many alternates) to the table to discuss transportation priorities for the future, has developed a remarkably knowledgeable group of citizens. Each person involved has devoted a considerable amount of time and passion to the cause of enhancing the way we move people and goods through the Trans-Lake corridors and we have developed a considerable amount of respect and trust among ourselves.

We believe there is a fundamental link between the transportation decisions made as a result of this study and our region's ability to implement its growth management vision of strong interconnected urban centers, a healthy environment, a strong economy, and a firm urban growth boundary. In the final analysis, growth management cannot be achieved without a transportation system that will support mobility needs within an increasingly dense and large urban area. Unless people and goods are able to move around efficiently within the urban growth area, growth management will ultimately fail.

ATTACHMENT

Recommended "Early Actions" to Expedite Trans-Lake Progress

(Subject to relevant agencies' processes and resources.)

Many of the recommendations of the committee will require extensive study, and their implementation will take many years. The committee sees actions that can be taken in the short term, based on policy decisions or actions of existing programs outside of the EIS. Other items may be implementable in the mid-range (4-10 years), based on the outcome of further environmental study. The committee recommends that such early-term actions be taken by appropriate entities as rapidly as possible to address Trans-Lake problems. These include:

Trans-Lake Wide Principles

The region's Trans-Lake transportation problems are not merely those concerned with new or modified facilities. A host of day-to-day operational problems exist and need attention in the interim. These include recommending that WSDOT improve safety and convenience for pedestrians' and bicyclists' access to existing facilities, mitigate noise and cut through traffic problems, and improve HOV/transit speed and reliability throughout the Trans-Lake study area. A variety of entities should build on successful examples of and provide incentives to increase use of HOV/transit in the study area. In addition, specifically:

- We recommend that the TDM Roundtable, as convened by the Puget Sound Regional Council, include in its work plan an early focus on funding, strengthening and the coordination of TDM programs in the Trans-Lake corridors.

- WSDOT should develop an emergency plan for all Trans-Lake corridors that, among other alternatives, studies the feasibility of giving preference to HOV, transit, and freight on a temporary basis in an emergency.

- King County should reexamine its transit zone structure to more accurately reflect distances traveled.

- WSDOT should implement an expanded motorist service patrol program throughout the Trans-Lake corridor.

SR 520 Actions

- WSDOT should work with affected communities to examine and implement (where shown effective) improved ramp metering operation eastbound and westbound on SR 520.

- WSDOT should accelerate priority for installing stormwater runoff management systems for reducing polluting runoff from the existing highway into Lake Washington and adjoining waters.

- WSDOT should examine the noise from joint vibrations on the existing bridge, reduce it if possible, and investigate other near-term noise mitigation techniques.

- WSDOT, in conjunction with local jurisdictions, should take measures to reduce noise from trucks using compression brakes.

- Local and state law enforcement agencies should provide greater enforcement of HOV laws in the corridor.

- WSDOT, King County, and local jurisdictions should improve bicycle access through consideration of a range of techniques, potentially including lockers, trails, and access via bike trailers during peak hours.

SR 513 (Montlake Boulevard) Actions

- SEATRAN and WSDOT should request the Coast Guard to keep the Montlake Bridge down during the evening peak hours (3-7 p.m.).

- SEATRAN and King County should examine the location of bus stops to improve transit priority coming from Pacific Avenue onto Montlake Boulevard southbound, and for northbound Montlake bus traffic.

- SEATRAN and King County should study southbound HOV/transit lane possibilities on SR 513, in conjunction with local neighborhoods.

- SEATRAN and WSDOT should make improvements to traffic information systems (e.g. radio, signs), north of 45th, approaching SR 520 southbound to Montlake.

I-5 Actions

- WSDOT should explore allowing transit to use the I-5 north mainline shoulder to the SR 520 exit for an express bus/HOV lane during peak periods.

- WSDOT should study converting I-5 express lanes to become two-way transit or transit/HOV lanes during current open hours (barrier separated).

SR 522 Actions

- WSDOT, King County, and local jurisdictions should provide preferential treatment for transit and HOV, as stated in the SR 522 recommendations.

High-Capacity Transit Actions

- Sound Transit should accelerate its planning for high-capacity transit alternatives for Trans-Lake service to serve as input to the EIS resulting from the Trans-Lake Washington Study Committee recommendations.

We affirm that this report contains the findings and recommendations of the Trans-Lake Washington Study Committee to the Washington State Transportation Commission and that these recommendations are a fair compilation and description of our deliberations. We forward for study an array of ideas. We note that our recommendation to further evaluate an idea is not, at this time, an endorsement by individual members to implement any specific solution.

Jean Amick, Seattle Neighborhoods
Dan Becker, Points Committee
Councilmember Richard Conlin, City of Seattle
David Cortelyou, Seattle Business
Paul Cowles, North Lake Business
Commissioner Aubrey Davis, Washington State Transportation Commission
Bob Edwards, Puget Sound Regional Council
Margaret Doman, Eastside Neighborhoods
Councilmember Maggi Fimia, King County
Councilmember Nona Ganz, City of Kirkland
Mary Gates, Sound Transit
Peggy Gerdes, North Lake Neighborhoods
Robert Gillespie, Eastside Business
Daryl Grigsby, City of Seattle, Transportation Department
Virginia Gunby, 1000 Friends of Washington
Jim Hill, Eastside Business
Tom Heller, Seattle Neighborhoods
Senator Jim Horn, Washington State Senate
Mayor Rosemarie Ives, City of Redmond
Senator Ken Jacobsen, Washington State Senate
Doug Jacobson, City of Lake Forest Park
Anne Knight, Transportation Choices Coalition
Jean Leed, Seattle Neighborhoods
Councilmember Connie Marshall, City of Bellevue
Councilmember Richard McIver, City of Seattle
Councilmember Rob McKenna, King County
Representative Ed Murray, Washington State House of Representatives
Phil Noble, Eastside Neighborhoods
John Okamoto, Washington State Department of Transportation
Councilmember Peter Orser, City of Mercer Island
Doug Pullen, Highway Users Association
Rick Pusateri, Eastside Business
Janet Ray, AAA of Washington
Phillip Rourke, Points Communities Neighborhoods
Scott Rutherford, University of Washington
Executive Ron Sims, King County
Councilmember Cynthia Sullivan, King County
Dick Taylor, City of Bothell
Donovan Tracy, Eastside Business
Ward Truess, Eastside Transportation Committee
Jim Tutton, Washington Trucking Association
Eugene Wasserman, Seattle Businesses
Raleigh Watts, Seattle Neighborhoods
Mark Weed, Seattle Business

Also on the Study Committee were: Dick Adams, T.R.U.S.T., Maynard Arsove, No Expansion of 520, and Representative Cheryl Pflug, Washington State House of Representatives

2. Transportation Setting

Congestion is a fact of daily life for people who travel across or around Lake Washington. The worsening quality of travel is clear to anyone who hears the area's traffic report coverage, with broadcasts 24 hours a day, always noting bridge conditions. Congestion is also a fact of life for the communities that have a major Trans-Lake route within their boundaries, as well as those who depend on these routes to connect to the greater region.

The members of the Trans-Lake Washington Study Committee, as well as many members of the public, voiced their concerns about transportation problems across the lake in very specific terms. Their issues and concerns arose at every step of the process, from defining the problem, to brainstorming about potential strategies, to deciding on a set of solutions.

All participants clearly recognized that the Trans-Lake routes were critical to their future growth and development. Representatives from business and freight industries noted the toll that congestion was taking on the regional economy. Neighborhoods beside the freeway were concerned about the effects of traffic through their community and how cut-through traffic and congestion affected neighborhood character. Some were concerned about whether the region could grow as planned, with or without major changes to Trans-Lake facilities. Some wanted actions that would reduce travel demand. Others believed that more travel had to be accommodated, but differed on where or how the system could be improved. Some committee members advocated strategies that increased capacity, while others suggested reducing capacity. Representatives from local governments and transportation agencies noted that regional policies have consistently favored actions that would shift travel demand from SOVs to other modes such as transit, HOV and non-motorized travel.

The committee started out unanimously on one issue: all showed a great deal of interest in how the Trans-Lake Washington system functioned today, and what forecasts showed about future travel. They sought specifics on how each of the three major routes operated, and how they related to other transportation facilities and services in the study area. They wanted to know how many people and vehicles the system carried, how safe and reliable it was, and how much of the load transit and HOV were carrying. Finally, they expressed consistent interest in the technical tools used to predict future travel conditions, particularly in terms of how well they reflected changes in the urbanized study area.

Existing Information on Transportation Conditions

In response to the committee's request for more details about transportation conditions in the study area, project staff reviewed existing data sources to provide information for the major facilities within the study area. This information included daily and peak hour traffic volumes, modal share, transit use, existing roadway capacity, traffic congestion, HOV lane travel speeds, average car occupancy, average vehicle occupancy, and person throughput on major study area east-west highway corridors.

Initial travel forecasting information provided to the committee was based on information included in the 1995 MTP. Existing traffic volumes were obtained from two different sources: 1) 1996 Ramp and Roadway Report, and 2) 1996 Annual Traffic Report. The Congestion Management System (CMS) Baseline System Performance Report, published by the Puget Sound Regional Council in May 1998 was the major source of information for HOV, occupancy and speed data. Although the CMS also contains information on traffic volumes, the Ramp and Roadway Report and the Annual Traffic Report provided the largest consistent amount of information available in the study area. The CMS report used data from fall 1995 for average weekday conditions, and committee members were advised that conditions may have worsened.

The information was assembled in the Inventory of Existing Conditions Information Report, which was provided to the committee in November 1998. The document is available for review through the WSDOT office of Urban Mobility. Most of the key elements of the report had previously been provided in committee presentations and papers given in summer and fall.

2.1 Major Components of the Transportation System

The major components of the transportation system in the Trans-Lake Washington Study Area are described below. Regional highway facilities are addressed first, and shown on Figure 2-1. Conditions on these facilities are described in Sections 2.2 and 2.3. The section below describes other key transportation facilities, services and programs in the study area, including HOV facilities, transit, park-and-rides, trails, and TDM programs.

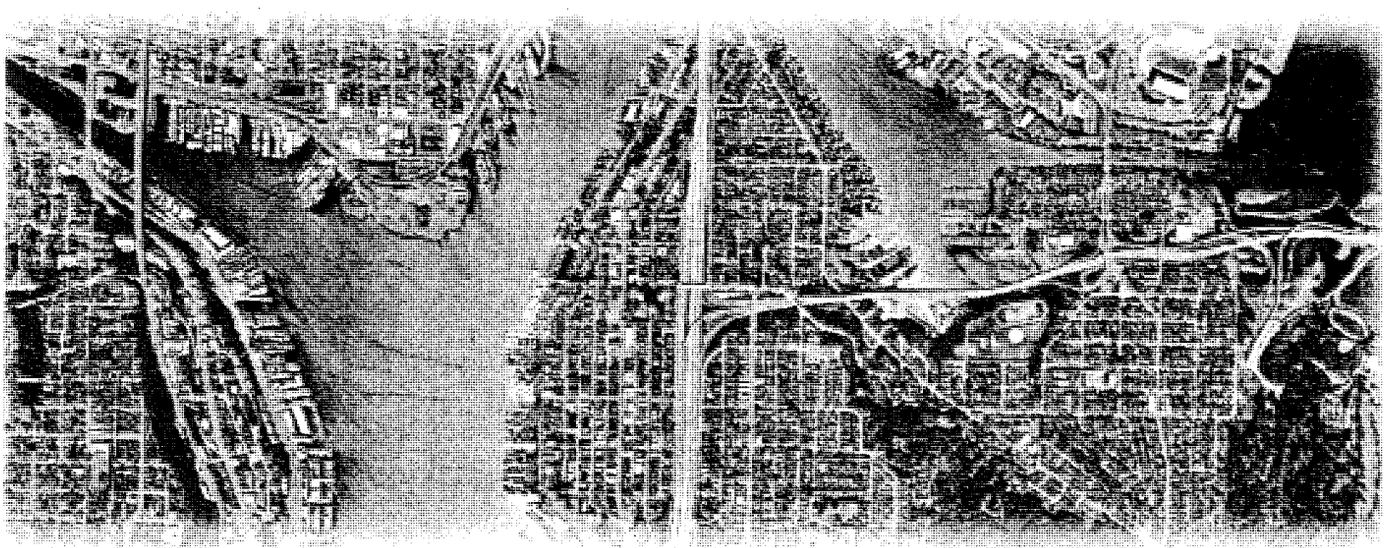
2.1.1 Regional Highways

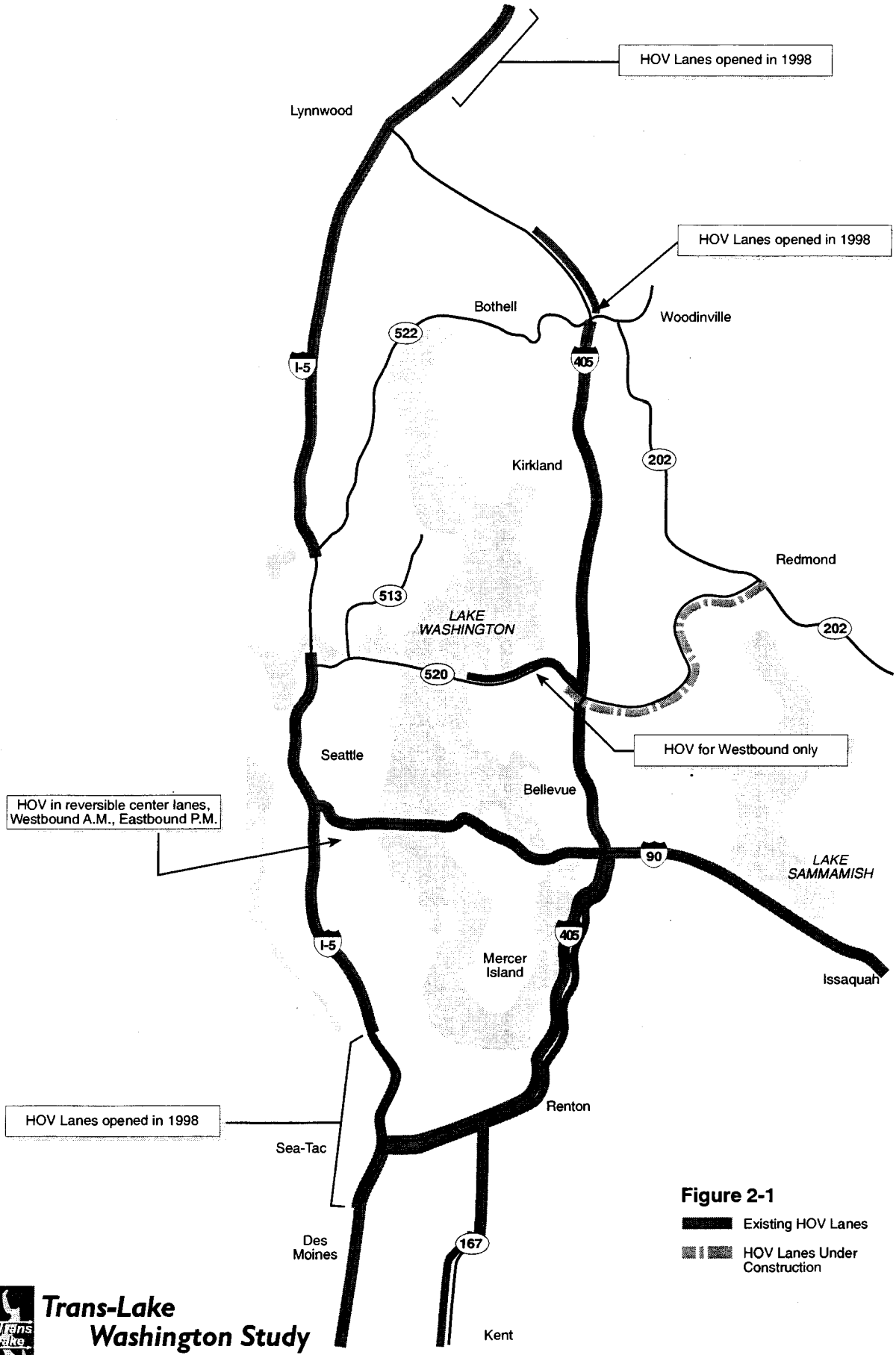
State Route 522 – SR 522 is a four-lane arterial that is officially designated an east-west route around the north end of Lake Washington, although it also provides for north-south travel on the west side of Lake Washington. It connects with I-5 at NE 65th Street in Seattle, and with I-405 in Bothell. Traffic signals are found at most major intersections, and there are transit-only lanes in a few locations. The facility currently experiences average daily vehicle volumes of 54,000, and is near its capacity during peak periods. Travel volumes have been at this level for over a decade.

State Route 520 – SR 520 is an east-west freeway linking I-5 in Seattle to SR 202 in Redmond, including a crossing of Lake Washington via the Evergreen Point Floating Bridge, and a major interchange with I-405 in Bellevue. In the study area, SR 520 has four general-purpose lanes, and a westbound HOV lane from I-405 to the Evergreen Point Floating Bridge. Eastbound and westbound HOV facilities will open to traffic east of I-405 in late 1999. The State's Freight and Goods Transportation System has classified SR 520 as a T-2 facility, responsible for accommodating 5 to 10 million tons of freight annually, and 400 to 800 large trucks a day. In the vicinity of the bridge, congestion is experienced in both directions during AM and PM peak hours. SR 520 is also considered near or above its capacity at peak periods, and with future growth the periods of congested travel will occur through much of the day. It also has limited shoulders for much of the sections to the east and west of the bridge, as well as on the bridge itself. In many locations, curves, vertical crests, and entrance and exit ramps do not meet current design standards, decreasing operating reliability and increasing the number of incident-related delays.

Trans-Lake Washington Study

2. Transportation Setting





Source: WSDOT webpage

Trans-Lake Washington Study

Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 23-1631-16 (A17) (S)

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Figure 2-1
Regional Highways and HOV System

Interstate 90 – I-90 is a major east-west freeway crossing the northern United States, providing connections between Boston, Chicago, Spokane, and the Puget Sound region. In the study area, I-90 is primarily a six-lane section. From I-405 to I-5, there are two additional reversible-direction HOV lanes in the center of I-90. The State's Freight and Goods Transportation System has classified I-90 as a T-1 facility, a major freight route that is responsible for handling over 800 large truck trips daily. The average daily vehicle volumes on I-90 are 148,000, and the highway is at or above capacity in one or both directions at peak periods. As with SR 520, future forecasts predict travel growth to steadily increase, with congestion spreading through much of the day.

Interstate 5 – I-5 is the major north-south freeway in the western United States, connecting California, Washington, and Oregon, and terminating at the borders with Mexico and Canada. Many of the west coasts largest cities are served by I-5, including Seattle, Portland, Sacramento, Los Angeles, and San Diego. In the Seattle area, I-5 is primarily an eight-lane facility. A reversible express facility exists between Northgate and Downtown. The segment of I-5 that connects with SR 522, SR 520, and I-90 is one of the busiest and most congested in the state. The State's Freight and Goods Transportation System has classified I-5 as a T-1 facility, meaning that it accommodates over 10 million tons of freight annually, and over 800 large trucks a day. The interstate carries average daily traffic volumes of 233,000 vehicles in the Central Seattle area.

Interstate 405 – I-405 is a north-south freeway around Lake Washington, terminating at its south end with I-5 in Tukwila, and at the north end at I-5 in Snohomish County, in Lynnwood. It is the only north-south regional route on the east side of Lake Washington, and it connects several of the region's major urban centers, including Bellevue and Renton. In the Study area, I-405 is primarily an eight-lane freeway with three general-purpose lanes and an HOV lane in each direction. The State's Freight and Goods Transportation System has classified I-405 as a T-1 facility. The interstate carries average daily vehicle volumes ranging from 151,000 to 159,000.

2.1.2 Existing HOV System

The existing and future additions to the HOV system are shown in Figure 2-1. Current system design policies provide HOV lanes on the inside of the freeway (left) with the general-purpose lanes on the right.

Of the three major Trans-Lake routes, only I-90 has a continuous HOV facility that extends from one side of the lake to the other, and even with I-90, only one direction of travel is served at a time. The I-90 center reversible lanes between I-405 and I-5 serve westbound travel during the AM peak and eastbound travel during the PM peak. Between I-405 and Mercer Island, the center lanes are reserved for HOVs only, and general-purpose traffic to and from Mercer Island are also authorized to use the center lanes between Mercer Island and I-5. Between I-405 and Issaquah, inside HOV lanes serve travel in both directions.

On SR 520, an HOV lane exists on a converted shoulder for westbound travel only for a segment from NE 104th to the approach to the bridge. Improvements are now being completed for HOV lanes in both directions from NE 104th to West Lake Sammamish Parkway. On SR 522, there are several segments with peak period (3:00 to 6:00 p.m.) transit-only lanes, with additional segments to be developed over the next several years.

While I-5 has HOV lanes in several segments of the study area, including ramp connections between I-90 and I-5, there are no HOV lanes between SR 520 and Northgate. The express lanes between downtown Seattle and Northgate are open to general traffic, although they are used by express bus routes from Northgate and the SR 522 corridor. On I-405, the HOV program is largely completed within the study area, including a program to move all outside HOV lanes to the inside lane. A missing link remains for a segment near the north end of I-405 corridor to the I-5/I-405 interchange (although new HOV lanes were recently opened to traffic on I-405 between SR 522 and SR 527).

Most the remaining programmed projects for HOV facilities in the region are for arterial HOV projects, and for Direct Access Ramps that will facilitate transit access at interchanges without requiring "weaving" across lanes of traffic to reach inside HOV lanes. Several direct access ramp projects are included in Sound Transit's *Sound Move* program, including Mercer Island, downtown Bellevue and in Kirkland. Until these ramps are built, some transit vehicles will not always have access to HOV lanes.

Near the lake, SR 520 has only one HOV lane. A westbound lane is on the lakes east side. It uses the roadway shoulder.

2.1.3 Transit Facilities and Services

The Trans-Lake study area is served by Sound Transit, King County Metro, and Snohomish County Community Transit services, providing a total of 136 transit routes throughout the study area. The service plans for Sound Transit's express routes in the study area were being finalized and implemented during the Trans-Lake Washington Study. In several cases, services that had been provided by Metro Transit and Community Transit are now provided by Sound Transit services, including Bellevue/Seattle and Everett/Bellevue routes. These and other planned service changes were included in future system evaluations. All of the Trans-Lake routes are important transit corridors serving several hundred bus trips daily. Metro also operates vanpool and rideshare matching programs in the region, with vanpools serving as a popular alternative mode, linking major employment and residential areas on either side of the lake.

2.1.3.1 Park and Ride Lots and Transit Centers

There are a total of 29 park-and-ride lots in the Trans-Lake study area, with the majority of them located along the I-405 corridor between SR 522 and I-90. Approximately 40 percent of the study area lots are currently 70 percent occupied or higher. Most of the facilities that primarily service Trans-Lake travel markets are consistently at capacity. The available capacity in the study area is generally found at leased lots with limited bus services.

Transit centers are major timed-transfer points that allow riders to plan their trips with minimum wait times between buses. The study area also includes numerous smaller transfer points, which serve a similar purpose as transit centers but without the degree of amenities, services or route choices available at major transit centers. Major transfer points are also timed-transfer locations. Within the Trans-Lake Study area, the major transfer points are Kirkland and Bellevue transit centers, as well as the Montlake, Evergreen Point, Kenmore, Lake City, and I-5/NE 45th Street. The downtown Seattle Transit Tunnel also serves several of the major Trans-Lake routes, with other accommodated on downtown streets. Transfer points for these routes exist throughout the downtown Seattle area.

2.1.3.2 Non-Motorized Routes

There are many Class I, II, and III bicycle and pedestrian trails within the Trans-Lake Washington Study area, but the number of Trans-Lake routes is more limited. Class I bicycle trails are paved and have exclusive rights-of-way for the principal use of bicycles. Class II bicycle lanes are striped within the paved area of arterials and are signed as designated bikeways. Class III bicycle facilities are along existing arterials (without striping) and are intended to provide continuity within the bikeway system.

The Burke-Gilman Trail is a Class I facility which parallels several miles of SR 522 from near the I-405 interchange to the west side of the lake. On the east side, Burke-Gilman connects to the Sammamish River Trail that runs north-south between Woodinville and Redmond. On the west side of the lake, Burke-Gilman connects to other regional trails and designated routes near the University District, and continues east to Ballard. SR 522 itself does not currently have continuous bicycle or pedestrian facilities, although such facilities have been included in several improved sections.

SR 520 does not currently have pedestrian or bicycle facilities approaching or across the lake, but a new Class I facility along SR 520 between I-405 and East Lake Sammamish Parkway is near completion. I-90 has a Class I facility (I-90 trail) for a four-mile segment from Dearborn Street/Rainier Avenue South to the Mercer Slough area in Bellevue, with connections to other north/south trails and designated routes on both sides of the lake and on Mercer Island.

2.1.3.3 Travel Demand Management

TDM strategies are targeted at managing or reducing travel demand. TDM measures may include programs to shift demand from SOVs to other modes such as transit and ridesharing, to shift demand to off-peak periods, or to eliminate the demand for the trip altogether. The 1995 MTP assumes an aggressive TDM program that would accomplish a substantial reduction in the rate of growth in vehicle trips over the next two decades. However, as the Trans-Lake Washington Study was being conducted, the region was still moving to define, implement, and fund all the programs envisioned in the MTP. In November 1998, a TDM Action Strategy was endorsed by the Regional Council's Transportation and Growth Management Policy Boards. Regional transportation staff developed this strategy over the past two years, and it is intended to guide the implementation of the regional TDM program. The TDM strategies have been organized into the following categories:

- TDM support infrastructure and public transit mode support measures
- Vanpooling
- Employer-based strategies
- Alternative transportation products and services
- Financial disincentives to driving alone
- Land use strategies

All of these strategies would be available to Trans-Lake Washington Study area jurisdictions for implementation. Appendix 3 contains a discussion paper on TDM Strategies and Estimated Effectiveness. The paper, which was presented to the Study Committee in March 1999, provided more detail on what would be assumed for the TDM element of potential solution sets based on the MTP.

Currently the region already has a strong commitment to TDM programs and an overlapping set of local and regional plans and programs to support alternative modes. Metro operates the largest publicly owned vanpool program in the country – with more than 500 vans making 3 million trips per year. In 1999, Metro reported that more than 5,000 people used those vans every day, eliminating about 4,500 vehicles from area roads. Metro also works with employers in the Puget Sound region, providing products and services for commuting to work by alternative methods, rather than driving alone. Metro provides support for employers affected by the Commute Trip Reduction (CTR) law, as well as businesses that are complying voluntarily. Metro works with employers, cities, neighboring transit agencies, community groups, business organizations, and community groups to offer a full array of transportation services and assistance. Metro contributes technical expertise along with product and service options, and under certain circumstances, can also contribute partial funding or other resources for projects designed to promote alternative commuting methods. Below is a partial listing of the options currently available through Metro:

Product	Description
Alternative Work Schedules	Compressed or flexible work schedules allowing employees to work longer hours in fewer days.
Biking and Walking	Alternative commute mode that can be subsidized.
Business Use of Vans	A program making Metro commuter vans available for use by employees (at that worksite) during the business day.
Carsharing	A convenient and economical alternative to owning a personal vehicle.
Commuter Bonus	A non-taxable voucher program that encourages employees to take the bus, a vanpool, or a ferry.
Commuter Bonus Plus	A voucher program to encourage employees to commute by carpool, or walking and biking.
Carpools	Alternative commute mode that can be subsidized.
Custom Bus	A special service for areas with limited bus service.
Datamatch	A computerized ridematching service to encourage employees to "share the ride".
Flex Pass	A comprehensive discount pass program that can be customized to include commute incentives.
Home Free Guarantee	A program that ensures an emergency ride home for employees using alternative commute modes.
Parking Cash-Out	A program for offering employees a choice between a subsidized parking space and cash.
Pass Subsidy	A variety of options for businesses interested in purchasing employee transit passes.
Preferential Parking	Program that reserves worksite parking spaces for those employees commuting by carpool and vanpool.
Ridematch	A computerized ridematching database and mapping service.
Rideshare Plus	A customized service approach for carpool and vanpool information that employers can contract for.
Vanpools	A program that supplies vans to groups of employees to share.

In addition, several of the eastside urban centers have established "Transportation Management Associations" (TMA). These non-profit groups are designed to assist employers and developers with their transportation management programs. In many cases, the policies and plans of the local jurisdictions encourage or require participation, including as a condition of permitting or as part of a subarea transportation plan. The three established TMA's are TransManage in downtown Bellevue, the greater Redmond TMA, and the Bothell TMA. Their services range from managing CTR programs for local employers, to developing, marketing, and promoting alternative commute programs. The greater Redmond TMA, which is the largest of the three with approximately 170 corporate participants in 1999, is particularly active. Among the services it provides to members is a "real time" ridematching computer program, donated by Microsoft, that allows participants to quickly survey potential commute partners.

2.2 Historical Trends

Travel volumes have steadily increased in all of the study area corridors over the last 20 years. The combined daily volumes on SR 520, I-90, and SR 522 more than doubled between 1974 to 1996, from approximately 140,000 to 300,000 (see Figure 2-2). This growth in travel corresponds to an annual compounded growth factor of nearly 4 percent. Below is a discussion of historic trends for the Trans-Lake Washington corridors over the past 10 years, in terms of both system and facility measures. The measures of current conditions correspond to most of the transportation effectiveness measures that were ultimately selected by the Study Committee for the evaluation of concepts and potential solutions. The information below helped establish general travel trends and conditions for the Trans-Lake system.

2.2.1 Traffic Volumes

The historic increase in traffic volumes on the Trans-Lake transportation system reflects several decades of growth in regional population and employment. The trends within the Trans-Lake Study area consistently show that as population and employment has increased, the resulting person trips has grown at an even higher rate, which follows a trend found in many metropolitan areas throughout the country.

The project team provided Study Committee members with traffic volume data collected for the Inventory of Existing Conditions Information Report. This section discusses the historical trends that affect traffic operations on the five primary corridors in the study area. Two sets of data are available to demonstrate the trends in traffic: 1) daily traffic and 2) peak hour traffic.

2.2.1.1 Daily Traffic Volumes

Daily traffic is the measure of the number of vehicles traveling in both directions on a single corridor during a 24-hour period. Daily traffic volume data is valuable when it is compared with peak hour data or congestion data. Daily traffic volumes for the three Trans-Lake Corridors are discussed below from north to south.

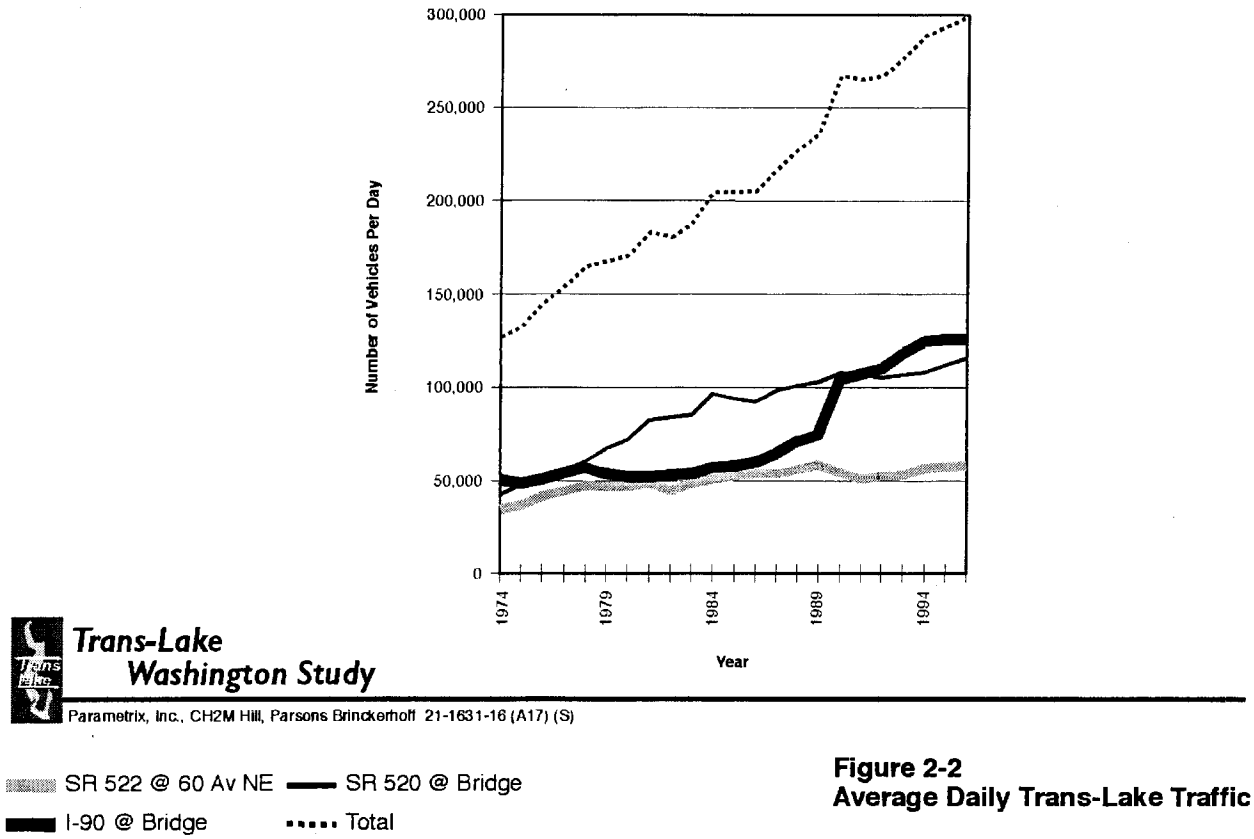


Figure 2-2
Average Daily Trans-Lake Traffic

Daily traffic on SR 522 has not changed to any significant degree since 1985, indicating that the corridor has operated at or near its capacity for well over a decade. SR 522 is signal controlled and serves as a local and regional commute and commercial corridor between the City of Seattle and communities north and east of the lake. Commute travel is primarily Seattle-oriented, with travel heaviest during the westbound morning commute and the eastbound evening commute. SR 522 is the only east-west corridor in the study area that still has a significant difference between eastbound and westbound volumes at peak periods.

SR 520 has shown a gradual, but steady, increase in volume between 1984 and the present, although the facility is already at capacity during peak periods. Vehicle travel volumes in both directions are generally balanced, with the differences in peak direction volumes due primarily to having one westbound HOV lane on the east side of the lake, and no other HOV lanes between I-5 and I-405. Daily volumes have increased in the last few years as the length of the peak period travel times has extended. More discussion of this issue is provided in the review of peak hour operations below.

On I-90, there has been a significant increase in volume since the year 1990, corresponding with the date when the reversible center lanes were opened to serve HOV and Mercer Island traffic. As with SR 520, much of this increase reflects the extended peak periods, and is described in a review of the peak hour traffic volume for I-90.

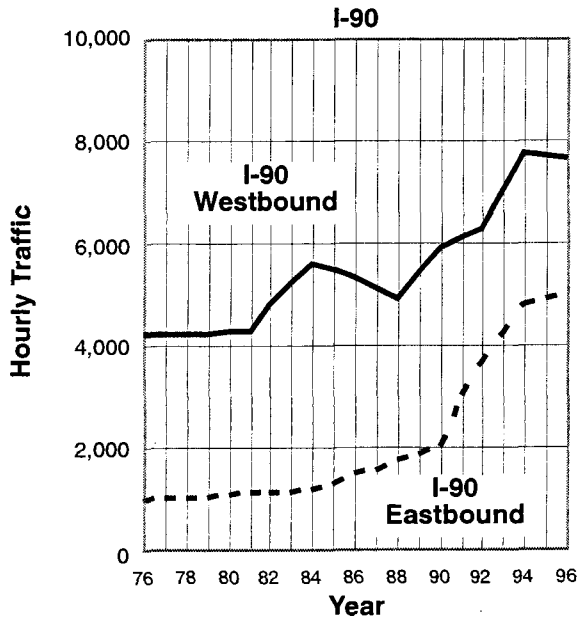
Overall, there has been a general rise in off-peak travel in each of the corridors. The SR 522 corridor has been increasing in off-peak travel more quickly than I-90 or SR 520, but the other two corridors also show that peak versus off-peak conditions are becoming more similar. This indicates that all of the corridors are reaching their capacity, and are at or near capacity during the peak commute periods.

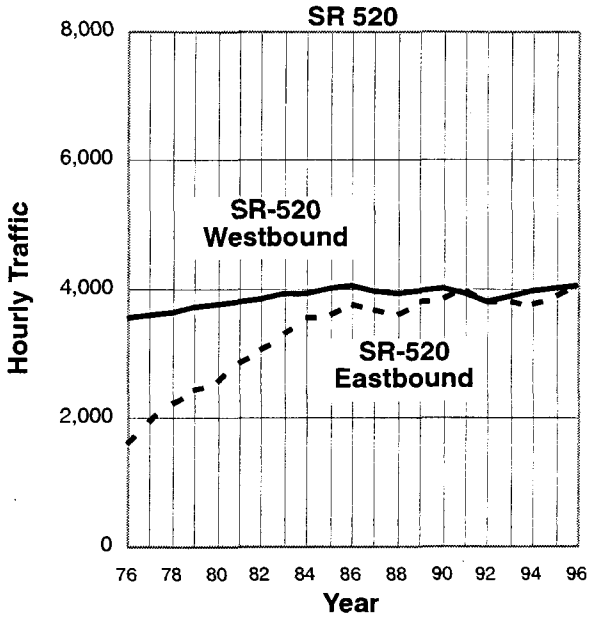
2.2.1.2 Peak Hour Traffic Volumes

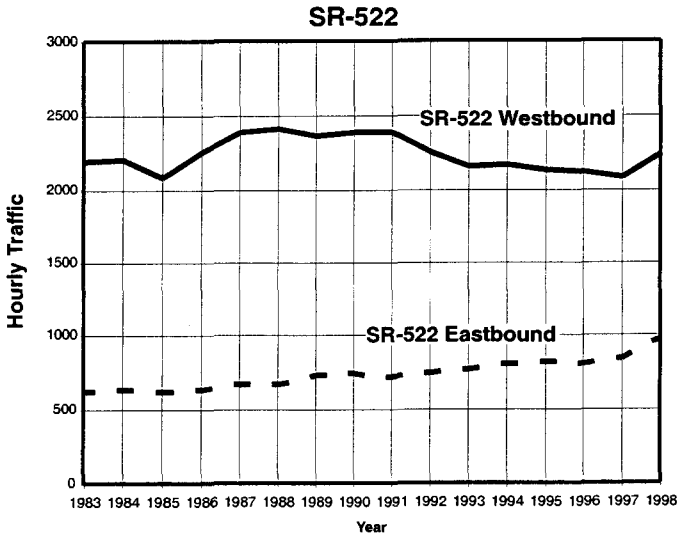
Figures 2-3 and 2-4 show past increases in peak hour volumes for the three Trans-Lake corridors. Figures 2-5 through 2-7 show how volumes range throughout the day, and clearly show that all three facilities are at or near capacity in one or both directions at peak periods. As the volumes approach the gray "at-capacity area", stop-and-go conditions result, and the roadway becomes far less efficient. In highly congested conditions, considerably fewer vehicles are served, compared to operations below capacity, with all vehicles traveling at normal speeds.

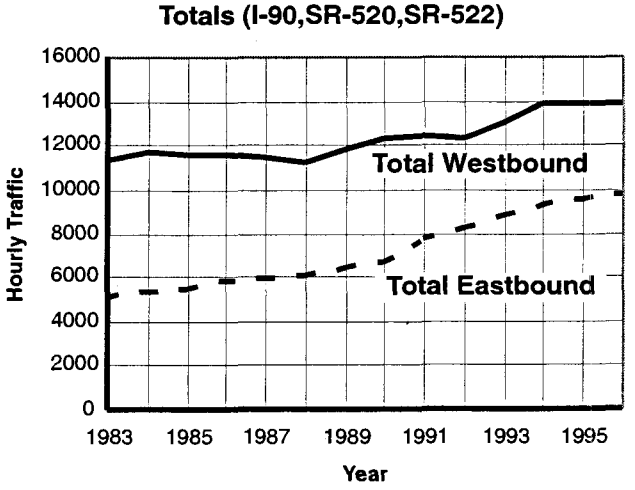
As previously noted, the I-90 corridor has shown a significant increase in daily traffic from 1990 and then a general flattening from 1994 to the present. Two primary factors appear to have caused this change in traffic: 1) development on the east side of Lake Washington has increased population and employment, with correlating traffic increases on I-90, and 2) the westbound and eastbound traffic volumes are increasingly similar through the peak. Up until 1990, traffic on I-90 was split 75 to 25 percent westbound to eastbound during the AM peak and the opposite during the PM peak until 1990, when the center span was opened, and volumes rapidly moved toward balanced flows in each direction. That balance has not been reached, however, because general-purpose lanes are reaching capacity in both directions, and the center roadway continues to operate reversibly.

Eastbound AM peak hour traffic increased between 1976 and 1988 to reach a balance with westbound traffic volumes. Return trips in the westbound direction during the PM peak are seen to mimic the AM peak hour operations. AM and PM peak hour traffic volumes are at capacity in both direction over the SR 520 bridge.





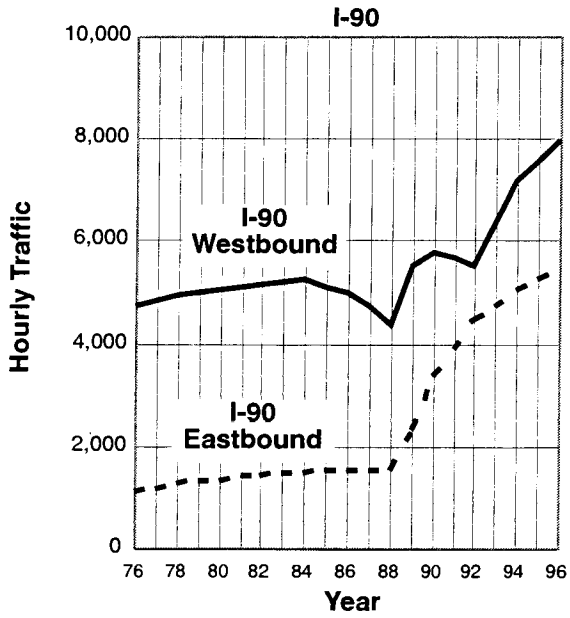


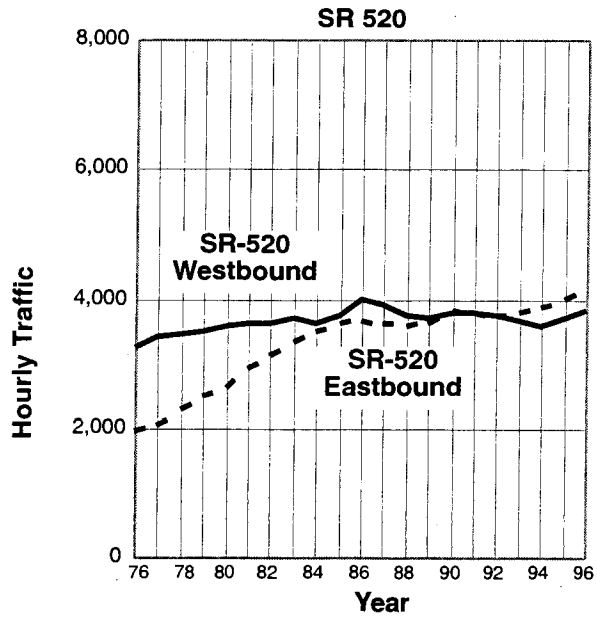


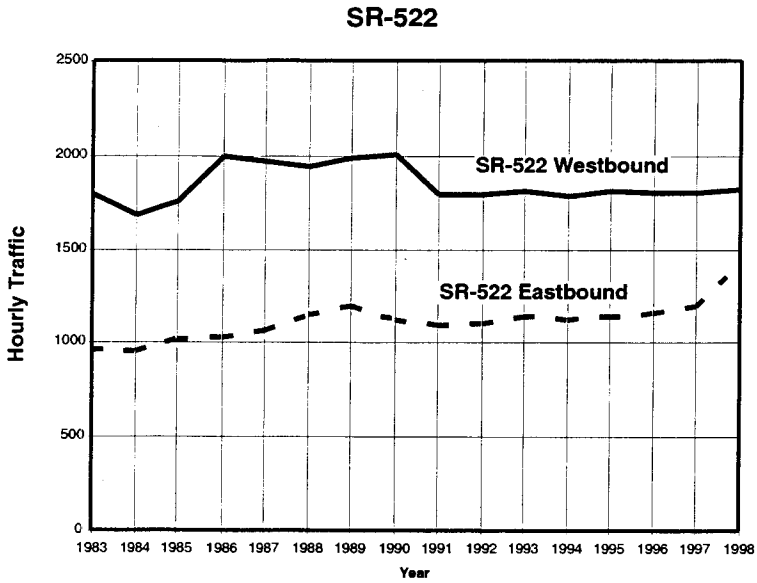
Trans-Lake Washington Study

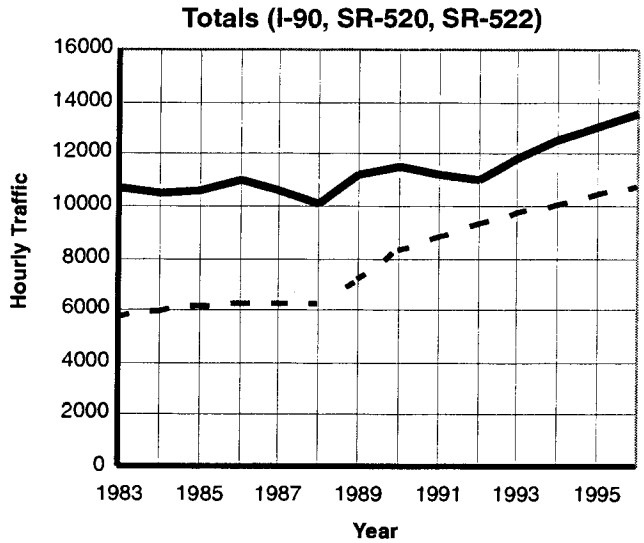
Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 21-1631-16 (A17) (S)

Figure 2-3
AM Peak Hour Trans-Lake Travel (Vehicles)





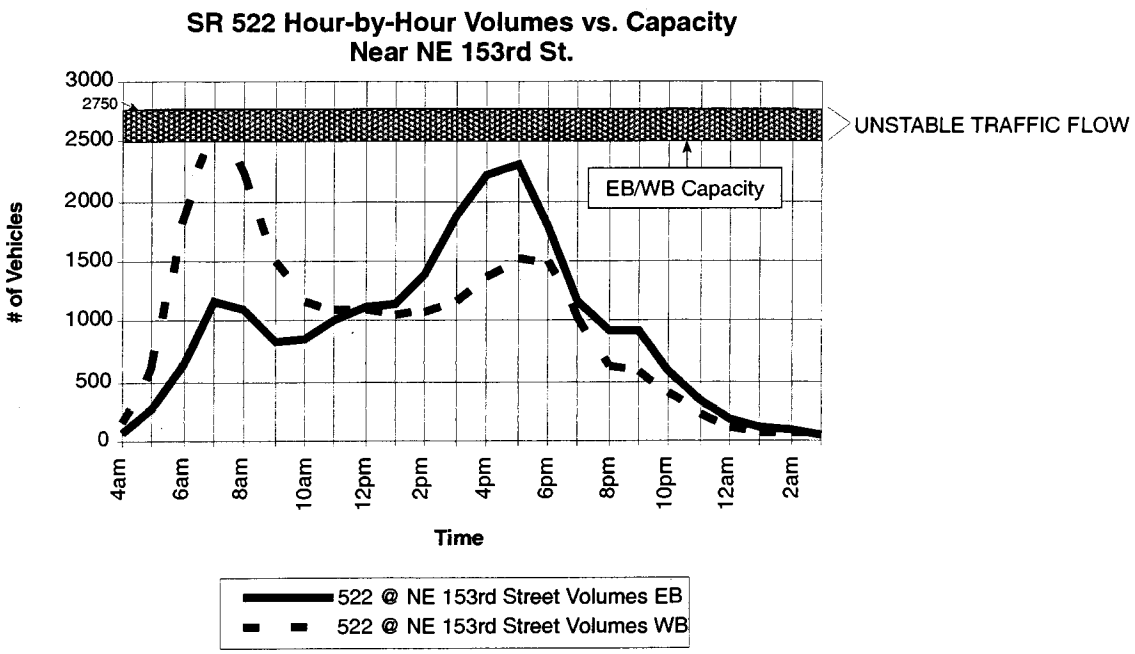




Trans-Lake Washington Study

Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 21-1631-16 (A17) (S)

Figure 2-4
PM Peak Hour Trans-Lake Travel (Vehicles)



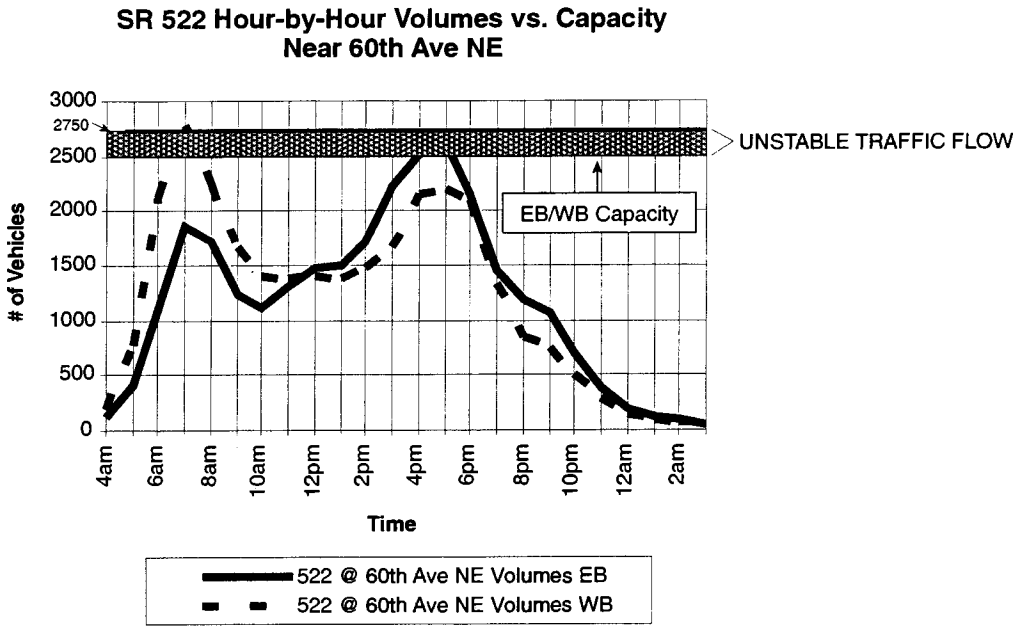
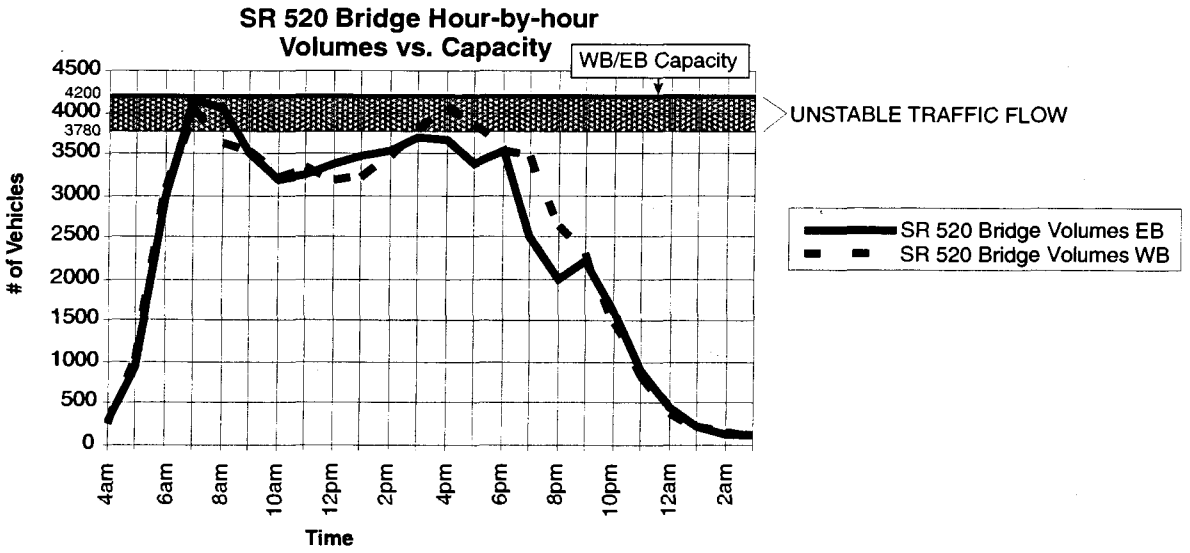
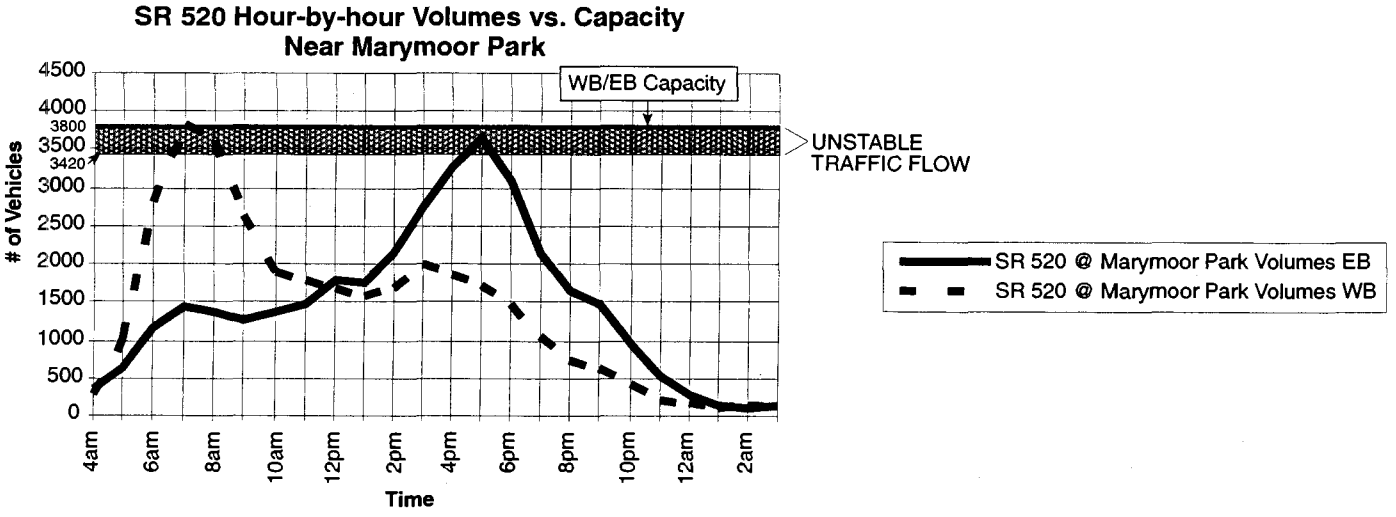
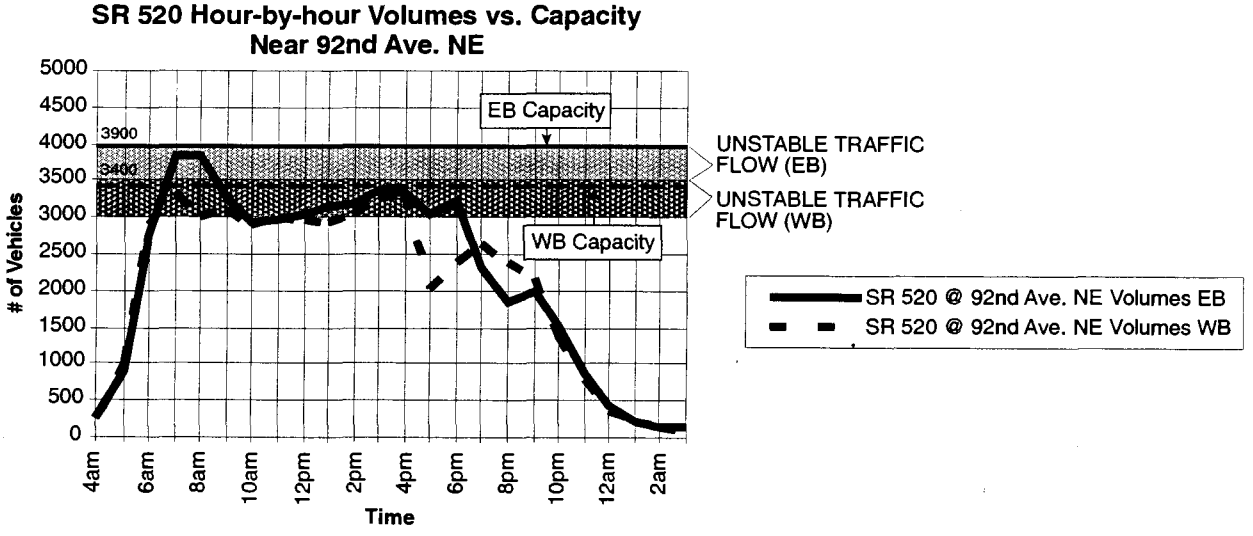


Figure 2-5
SR-522 Hour-by-Hour Volumes







Trans-Lake Washington Study

NOTE: Traffic volumes decrease during AM and PM peak periods due to congestion.

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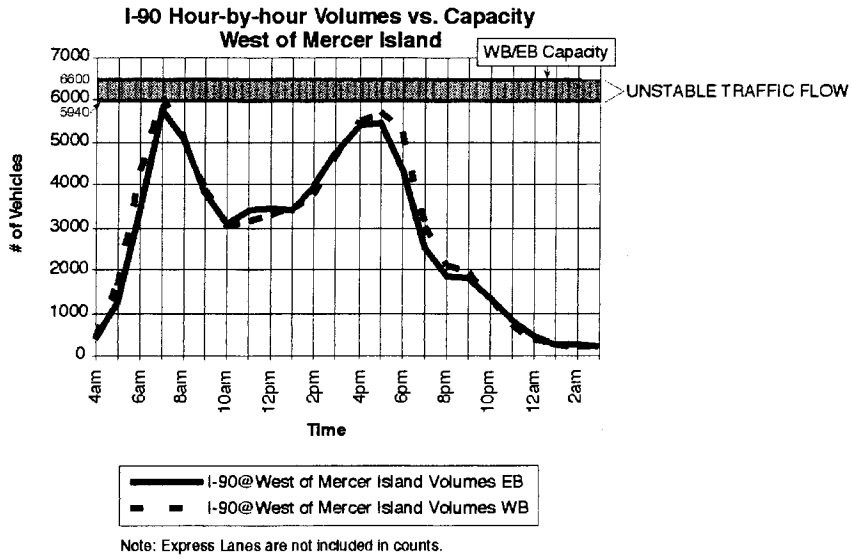
Figure 2-6
SR-520 Hour-by-Hour Volumes



Trans-Lake Washington Study

Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 21-1631-16 (A17) (S)

Figure 2-7
I-90 Hour-by-Hour Volumes

2.2.2 Transit Trips

Current transit ridership varies throughout the Trans-Lake study area. This information is summarized in Table 2-1 below. Throughout the entire corridor, however, over 75 percent of total daily ridership occurs during peak periods, with the transit service crossing the SR 520 bridge serving 87 percent of its daily ridership during peak periods.

Table 2-1. Transit Ridership in the Trans-Lake Corridor

Freeway	Location	Daily Ridership	Peak Periods Ridership
SR 520	Montlake to I-405	11,425	9,561
SR 520	NE 51st Street to SR 202	153	142
I-90	Rainier Avenue South to I-405	6,827	5,652
SR 522	I-5 to I-405	10,760	8,070
I-405	SR 520 to Totem Lake	3,910	3,435
I-405	112th Avenue SE to SE 8th Street	2,019	1,645
I-5	Convention Center to Mercer Street	12,904	12,297

Source: SR 522 Corridor HOV Access Study, Final Task Report, May 1995
Source: Congestion Management System, Baseline System Performance Report, May 1998

2.2.3 Mode Choice

Committee members were provided a number of regional sources supporting trends in mode choice, but a consistent set of information for all three of the Trans-Lake corridors was not readily available. Committee members were introduced to the use of the measure, and to other related measures such as Average Vehicle Occupancy (AVO) and Person-Throughput, both of which were available for one or more of the study area corridors. This information was provided to the committee in the existing conditions report.

As noted in the technical report on existing conditions information, CTR Programs Survey results indicated that all zones within the Trans-Lake study area had been evaluated, and they tended to show a shift from SOVs to other modes. Some of the changes were from SOV to either carpool or bus, but the largest change for the region was found in a category that included telecommuting, walking, and most importantly vanpools. According to the CTR survey, the region showed a reduction in SOV trips ranging from 2.5 to 12.7 percent. Analysis in the CTR survey and in other regional sources predicts that SOV use will be less attractive as more HOV infrastructure is completed, and as congestion in general-purpose lanes increases.

2.2.4 Safety/Reliability

WSDOT produces an accident report for all of their facilities. The 1996 WSDOT Annual Accident Report was used to assess how safety on each of the corridors within the Trans-Lake Washington study area relates to the State average. Accident rates are calculated by the number of accidents occurring per million vehicle miles (mvm) of travel. The State average accident rate for interstate freeways was 1.6 per mvm for the year 1996. Accident rates on I-5 between I-90 and NE 175th Street exceed the State average by up to 4 per mvm. The total number of accidents per section of interstate evaluated range from 160 accidents/year to 587 accidents/year. This calculates to be one accident at least every three days and as often as two per day. Accident rates of this degree are likely to have a significant impact on the operation of the roadway. Accident data for 1996 is much greater than the previous four years accident data. This indicates a general upward trend for the accident rate along I-5 through the study area, which is consistent with the growth of traffic volumes.

I-90 has a high level of accidents at the freeway origin near SR 519 with an accident rate of 3.5 per mvm. This more than doubles the State average. However, the section under evaluation is less than one mile in length, therefore the number of accidents per year is low. Accident data for 1996 is greater than the previous four years throughout the study area. This indicates a general upward trend for the accident rate along I-90 through the study area.

The I-405 accident rate is just below the State average for interstate facilities. The four-year accident rate is greater than the 1996 accident rate, which indicates a general downward trend for accidents on I-405.

Accidents on SR 520 exceed the State average accident rate for interstates by a factor of at least two at both ends of the corridor. The west-end of the corridor includes the I-5 connection to the east-end of the Evergreen Point Floating Bridge. West Lake

Sammamish Parkway is the end section of the data for SR 520. The same general trend for increasing accidents along SR 520 is shown with the four-year accident data being less than the 1996 data. SR 520 also suffers from a high degree of incident-related delays, substantially the reducing reliability of the corridor. Aside from safety and operational constraints related to the facility's outdated design, the lack of shoulders provides no edge for disabled vehicles, directly impeding traffic flows.

SR 522 is categorized as a primary arterial for the project study area. Average accident rates for the State's primary arterials are 2.97 per mvm. Accident rates on SR 522 from I-5 to I-405 range from 3.7 per mvm to 6.5 per mvm with the current year of accident data exceeding the four-year accident data in all locations except I-405. This indicates a general increasing trend for accidents on the corridor.

2.2.5 Bottleneck Locations

Congestion indicates that the available roadway capacity is fully utilized and traffic is forced to operate at lower speeds and with limited maneuverability. Much of the congestion experienced today is the result of a bottleneck in the corridor. Bottlenecks exist at points that limit the number of vehicles in a corridor to less than previous capacity (upstream), creating a backup. Typical examples are at traffic on-ramps, where traffic is forced to change a lane in order to remain on the freeway; here, the per lane capacity of the freeway is reduced, creating a bottleneck. Another example would be a freeway lane that terminates to an off-ramp, requiring vehicles to either exit or change lanes; if the entire lane of traffic does not exit, capacity is reduced at that point and a bottleneck is created.

The Washington Transportation Center (TRAC) completed analysis of the Puget Sound area principal highways and freeways in an effort to assist WSDOT in making transportation management decisions and performing corridor evaluation. Information provided by TRAC includes a general pictorial representation of daily traffic operations for all of the Trans-Lake corridors and the two, north-south freeways within the Study area. A narrative summary of the physical and operating conditions that result in bottlenecks within the study are all provided below.

2.2.5.1 I-90 Bottlenecks

The Trans-Lake Study Area includes I-90 as its southern boundary. Evaluation of this corridor extends from downtown Seattle to the I-405 interchange. Through the Trans-Lake study area, I-90 consists of a basic three-lane general-purpose highway in both directions, with two reversible HOV lanes in the center. Mercer Island traffic can also utilize the HOV lanes for access to and from Mercer Island ramps only. Two locations have been identified as bottleneck areas in the eastbound direction: 1) western high-rise, and 2) Island Crest Way interchange. The western high-rise is the east exit from the Mount Baker Tunnels. Backups occur at both locations during both the AM and PM peak hours with the longest backups occurring during the PM peak. Both locations show backups for approximately 1.5 miles. The western high-rise could be a common backup area because of the substandard design of roadway shoulder width in the tunnels combined with high traffic demands. Congestion that occurs at the Island Crest Way interchange could be attributed to high traffic demand and the merge that occurs just prior to the Luther Burbank Lid.

At West Mercer Way, backups form during both the AM and PM peak hours with the most significant backups occurring during the PM peak period. Backups during the PM peak hour appear to extend back nearly three miles from the West Mercer Way interchange area. This location is a bottleneck because it is the western terminus of the tunnel and a merge location.

On SR 520, high traffic volumes, limited capacity, and a series of bottlenecks combine to make stop-and-go conditions common.

2.2.5.2 SR 520

Traffic from I-5 near Seattle to Redmond is serviced via the SR 520 corridor. This corridor consists of two lanes in each direction for general-purpose traffic and one HOV lane westbound between I-405 and the Evergreen Point Floating Bridge. Although additional HOV lanes and collector/distributor lanes were being constructed during the Trans-Lake Washington Study and will soon be complete, they could not be included in the existing conditions analysis because detailed traffic information was not available.

Eastbound Travel on SR 520

Evergreen Point Floating Bridge Abutment – Queuing at the bridge abutment occurs because the SR 520 corridor is operating at peak capacity and two merges of traffic occur from ramps at Montlake and Lake Washington Boulevard. Neither of these access points meet current design standards for acceleration or merging. Traffic volumes on SR 520 prior to the Montlake interchange are 300 vehicles short of operating at capacity during the PM peak. Entering volumes from Montlake and Lake Washington Boulevard provide an additional 1,300 vehicles per hour (vph) to the corridor. This shows that the corridor is at a minimum 1,000 vph over capacity. This is a minimum because ramp meters, which operate in the evening peaks, control the Montlake and Lake Washington Boulevard on-ramps. The ramps to SR 520 from I-5 commonly back up onto I-5 in the northbound direction. Queuing at the bridge abutment is prevalent in both the AM and PM peak hours. While the AM peak queues are longer in length than the PM peak, they do not last as long.

I-405 to 124th Avenue NE Weave – Traffic joining SR 520 from northbound I-405 is forced to change lanes to continue east while traffic from SR 520 destined for 124th Avenue NE must change lanes in the opposite direction. This weaving traffic exceeds the maximum capacity for a weaving section and results in an over-capacity condition that results in queuing on SR 520 and I-405.

Westbound Travel on SR 520

NE 124th Street Weave – This weave location is the same as describe for the eastbound direction.

I-405 to NE 108th Street Weave – Traffic entering the SR 520 corridor from both north and southbound I-405 is forced to change one lane to continue west, while traffic from westbound SR 520 destined for the 108th Avenue NE exit are forced to change one lane. This type of geometric configuration is not expected service more than 1,800 vph with

existing traffic volumes exceeding that maximum. This area is also complicated by the queue that extends from the bridge abutment.

Evergreen Point Floating Bridge Abutment – This bridge abutment has similar geometric constraints to the west side of the bridge, but it is aggravated by the termination of the HOV lane just below the bridge. In addition to the HOV lane termination, bus traffic merges from the flyer stop located near the bridge abutment. Buses must merge into traffic from a stopped condition and up a gradual incline. The diagrams produced by TRAC indicate that the AM peak congestion extends back to the I-405 interchange and lasts for nearly an hour while the PM peak congestion extends to the same location and lasts for two to three hours.

2.2.5.3 SR 522

Congestion data was not gathered for SR 522 in the same manner as for the other Trans-Lake facilities. Although SR 522 is a state highway, it operates as a five-lane primary arterial, with closely spaced traffic signals. Some locations on the corridor are limited to four lanes.

Review of the corridor existing traffic volumes shows that traffic is primarily destined westbound in the AM peak and eastbound during the PM peak. Field visits have reported that traffic backs up in the AM peak from the signal at NE 145th Street down the hill into the Lake Forest Park area. Backups also occur in the AM peak at the 68th Avenue NE intersection back through the signal at 73rd Avenue NE.

During the PM peak, congestion occurs primarily in the eastbound direction. Traffic backs up at the second signal while waiting for permitted left turns to vacate the inside lane. There is no storage for left turning vehicles and the signal allows left turns during the peak hours of operation thus limiting SR 522 to less than two lanes at the signal. Congestion occurs again in the Lake City vicinity. This congestion is the result of several closely spaced intersections and fairly high cross street volumes. The next back up occurs from the Ballinger Way intersection back to the NE 145th Street intersection. A double left turn lane feeds a significant volume of traffic from NE 145th Street onto SR 522 to join the already over-capacity corridor. Traffic clears up until the signal at 68th Avenue NE where backups occur to the east, west, and south.

2.2.5.4 I-5

Regional traffic utilizes I-5 for access to major employment centers along the corridor including Seattle, Tacoma, Everett, Lynnwood, and Edmonds. It is also one of the key corridors providing access to the University of Washington (UW) Area. The Trans-Lake study area includes I-5 from just south of I-90 north to the NE 145th Street interchange. I-5 is comprised of northbound lanes, southbound lanes, and a reversible center lane configuration. Data was only available from TRAC for the northbound and southbound lanes; however, a separate evaluation of the center lanes was conducted using data from the WSDOT Ramps and Roadways report for 1998 traffic.

Northbound Travel on I-5

Downtown Ramps under Convention Center – Traffic backs up nearly seven miles behind the downtown section of I-5 during the AM peak and four miles during the PM peak hours. These backups last for about two hours with congestion at the I-90

interchange lasting nearly the entire day. Between the hours of 5:00 a.m. and 7:00 p.m. there are only three hours that are not severely congested at the I-90 interchange.

Mercer to SR 520 Weave – Traffic entering the freeway from Mercer Street does so on the left side of the freeway. Traffic from Mercer Street that is destined for SR 520 is forced to cross-over two lane lines to access the off-ramp. This maneuver must occur within a distance of 4,000 feet. Technically, by the Highway Capacity Manual definition of a weave, this entire section is not considered as a weave. The first portion from the Mercer Street on-ramp to the Lakeview off-ramp is within the criteria defined as a weave section. The segment from Lakeview to SR 520 is considered a basic freeway section. This section of freeway operates at a LOS F with speeds less than 40 miles per hour (mph).

Ship Canal Bridge – The Ship Canal Bridge poses several operational impacts. The first is the closely spaced sequential on-ramps. One of the ramps is a merge condition while the second is an added lane.

50th Street to SR 522 Weave – The lane configuration on I-5 is basically the three lanes through the SR 522 interchange; however, four lanes approach NE 50th Street and one lane is added from the NE 50th Street on-ramp. The outside lane terminates at NE 65th Street and the fourth lane terminates at the SR 522 interchange. The diagrams show severe congestion through this area during the PM peak period. This congestion is confirmed by field visits and by outside analysis. Analysis of I-5 from the NE 50th Street on-ramp to north of the SR 522 off-ramp registers as LOS F with speeds less than 40 mph.

SR 522 Lane Drop – This condition creates a bottleneck during the PM peak commute. Traffic traveling north during the AM peak is not affected by the lane drop at SR 522 because it does not exceed three lanes worth of capacity.

Southbound Travel on I-5

SR 522 Interchange Area – This bottleneck is associated with high traffic volumes, a complex weaving maneuver between the NE 85th Street on-ramp and the NE 70th Street off-ramp, a curve on the freeway, several under-crossings and limited shoulder widths. Severe congestion at this location occurs during the AM peak for a duration of approximately one hour. Moderate congestion is prevalent during most of the working hours with only a three-hour period servicing traffic at the posted speed.

Ship Canal Bridge – The ship canal bridge is part of a complex three-lane crossing weave from the NE 45th Street on-ramp to the SR 520 off-ramp. This type of weaving maneuver is more likely to impact all lanes of traffic due to each crossing vehicle slowing to find a safe gap between oncoming vehicles in the adjacent lane. Part of the complication for this weaving maneuver is the SR 520 exit occurring on the left side of the freeway where drivers anticipate travel un-impeded by ramp activity. Traffic also tends to decelerate prior to the ramp, thus reducing the available roadway capacity.

SR 520 to Mercer Weave – This weave is similar to the weave required between NE 45th Street and SR 520; however, the on-ramp joins I-5 on the left side and the off-ramp to Mercer Street is on the right side. To complicate things, there is an on-ramp from

Boylston Avenue mid-way between SR 520 and Mercer Street and the right side lane terminates at the Mercer Street off-ramp.

Downtown Ramps under Convention Center – Lane modifications from just north of the SR 520 on-ramp to south of the I-90 off-ramp results in the inside most lane at SR 520 becoming part of an optional diverge ramp to I-90 and the outside most lane. In other words, there is one freeway lane that extends from SR 520 to south of Seattle. As traffic destined through Seattle increases, the available capacity does not meet the demand. This is also evident on the I-5 Express lanes.

2.2.5.5 I-5 Express Lanes

Express lanes through the Seattle area are reversible and extend from downtown Seattle to the Northgate area. The lanes operate southbound in the AM and northbound in the PM. The primary bottleneck location for the express lanes operating northbound is at the Northgate interchange where express lanes join mainline I-5. One of the two express lanes joins I-5 as an HOV lane while the other joins as a general-purpose lane. HOV traffic benefits from this configuration because the general-purpose lane operates over capacity and backs up almost to the SR 522 interchange.

During the AM peak (when travel is southbound) the primary bottleneck occurs where the express lanes join southbound I-5 under the convention center. There are design features that seem to impose operational difficulties in the southbound direction. For example, three of the four express lanes terminate to downtown Seattle ramps leaving one continuing to south of Seattle. The one lane that continues south of Seattle enters into an HOV only lane, thus forcing the majority of traffic to merge into the adjacent lane.

2.2.5.6 I-405

I-405 was evaluated from the I-90 interchange to the SR 522 interchange. I-405 serves as a key north-south link for traffic destined to the major employment centers of Bellevue, Redmond, and Kirkland. There are three general-purpose lanes and one inside HOV lane on I-405 through the Trans-Lake Study Area. North of the SR 522 southern-most ramps and south of I-90, the number of general-purpose lanes drops to two.

Northbound Travel on I-405

SR 522 – The number of lanes on I-405 drops to two through the SR 522 interchange area, causing a severe bottleneck location. Traffic backs up through the NE 124th Street interchange as a consequence of this lane drop. Another reason for the backup is that when the lane drops to SR 522, traffic entering the I-405 corridor from NE 160th Street must weave across two lanes to continue north. This weaving activity further degrades the available capacity on I-405. Operational capacity constraints only occur during the PM peak period.

NE 116th Street/NE 124th Street – Geometrically, this section of I-405 is fairly complex and results in some slowing of traffic and ultimately a bottleneck location during the PM peak. The geometric complexity begins with the NE 85th Street on-ramp traffic destined for either the NE 116th Street or the NE 124th Street off-ramp. The off-ramps to NE 116th Street and NE 124th Street are closely spaced (1,500 feet) and traffic taking the NE 116th Street exit decelerates while still in the mainstream traffic of I-405, thus reducing the available capacity.

NE 8th Street to SR 520 – This section of I-405 is geometrically complex thus creating a bottleneck location. A weaving maneuver is required between the two interchanges and the volumes of traffic entering the weave section exceed the capacity of the roadway. Traffic joining I-405 from NE 85th Street is required to change one lane to continue north on I-405, and traffic from I-405 destined for eastbound SR 520 is also required to change lanes. Traffic volumes in the weave area during the PM peak are currently 175 percent greater than the geometry can service, thus the bottleneck forms near the NE 8th Street ramp. This same location operates near capacity during the AM peak period.

Southbound Travel on I-405

NE 116th Street/NE 124th Street – This interchange area consists of two closely spaced on-ramps that combined add 3,135 vehicles per hour to the AM peak hour flow of traffic on I-405 based on 1995 information. This combination of on-ramp volume exceeds one lane worth of capacity on a freely flowing section of freeway. To further complicate operations, both on-ramps merge into the outside lane of I-405 and it operates at 85 percent of its capacity prior to the first on-ramp.

NE 85th Street to NE 70th Street – A weave section is created when the NE 85th Street on-ramp joins I-405 as an auxiliary lane and terminates at the NE 70th Street off-ramp. When the congestion data was gathered in 1997 the outside lane of I-405 served as the HOV lane thus forcing traffic from NE 85th Street to change lanes twice in order to continue south on I-405. HOV lanes on I-405 have since been moved to the inside lane and congestion at this weave section has been reduced as a result. This location is a congestion problem during the AM peak only.

SE 8th Street to I-90 (Wilburton Tunnel) –This bottleneck occurs during the PM peak period. This location has similar operational constraints as the NE 85th to NE 70th Street weave because the Richards Road on-ramp traffic joins I-405 (as a merge) but must then exit to I-90 or change lanes to continue south. Again, when the congestion data was gathered the HOV lane was on the outside, thus forcing general-purpose traffic to change lanes out of the outside lane.

2.2.5.7 HOV Facilities

As outlined in the Inventory of Existing Conditions Information Report, a significant percentage of people travel across the lake using HOVs such as bus, carpool, or vanpool. I-5 and I-405 also show percentages of people using HOV that range from 30 to 42 percent. Data shows that 53 percent of the people crossing SR 520 during the morning peak are using HOV.

Several of the bottleneck locations identified in the previous section coincide with an HOV lane. The advantage of this lane configuration is that the HOV lane can continue to service more people per hour with higher speeds. The HOV lane is shown to operate 20 mph faster than the general-purpose lanes.

As noted before in the discussion of Transportation System Elements, plans for the HOV system include the completion of HOV lanes and the provision of direct access connections. Completion of the HOV lanes will provide seamless HOV service through the region that results in an additional incentive to utilize buses, vanpools, or carpools as a means of commuting. Direct access ramps will provide access from the center HOV

lane to specific park-and-ride lots throughout the region. These ramps will have two benefits for regional traffic: 1) buses will receive travel time benefits by avoiding the need to cross congested general-purpose traffic lanes and 2) general-purpose lane operations will no longer be affected by buses weaving through the lane to reach HOV lanes or exit ramps.

2.2.6 Travel Markets

Study Committee members requested several presentations on regional travel markets, and the tools and methods that were being applied to forecast and analyze travel demand. The Existing Conditions Information report provided a paper delivered for a Travel Market Presentation to the committee, including Trans-Lake Washington Study area trip origin/destination information.

The primary north-south corridors for regional travel are I-5 and I-405, which serve north-south travel to the west and east of Lake Washington. According to the travel market study, the primary destinations for Trans-Lake traffic are downtown Seattle, the University District, downtown Bellevue, and the Overlake area. According to the origin/destination data, daily traffic volumes on SR 520 and I-90 are nearly the same with I-90 carrying only 4 percent more traffic. These data coincide closely with the bottleneck information that shows SR 520 with extensive congestion for long periods of time and I-90 with minor congestion for short periods of time. The primary Trans-Lake travel market also appears to utilizes the SR 520 corridor between the two dense employment centers of Bellevue and Seattle.

2.2.6.1 I-90

Model output shows that westbound traffic on I-90 is split about 50/50 from I-405 north and south while a higher percentage of return trips eastbound go to the north on I-405. The greatest percentage of trips across the I-90 bridge originates and is destined east of I-405.

2.2.6.2 SR 520

Westbound traffic on SR 520 originates primarily from east of I-405 (40 percent) and north of SR 520 (40 percent) with only 20 percent originating from south of SR 520. Downtown Seattle is the destination for 35 percent of the westbound traffic and the University area off-ramps service another 29 percent of the trips with the remainder dispersing equally to northern arterials via I-5.

Downtown Seattle provides 37 percent of the eastbound traffic, southbound I-5 contributes 29 percent of the trips and the University area ramps fill in the remaining 34 percent. Destination for this traffic is shown to be about 38 percent to the north of SR 520, 33 percent to the east of I-405, and the remaining 29 percent destined for south of SR 520.

2.2.6.3 SR 522

Model output shows that 41 percent of the westbound traffic on SR 522 originates from Juanita Drive (68th Avenue NE). Two cross-streets with SR 522 draw large volumes of traffic: Ballinger Way and SR 523 (NE 145th Street). Traffic disperses equally from those two points in the northern and southern direction, respectively.

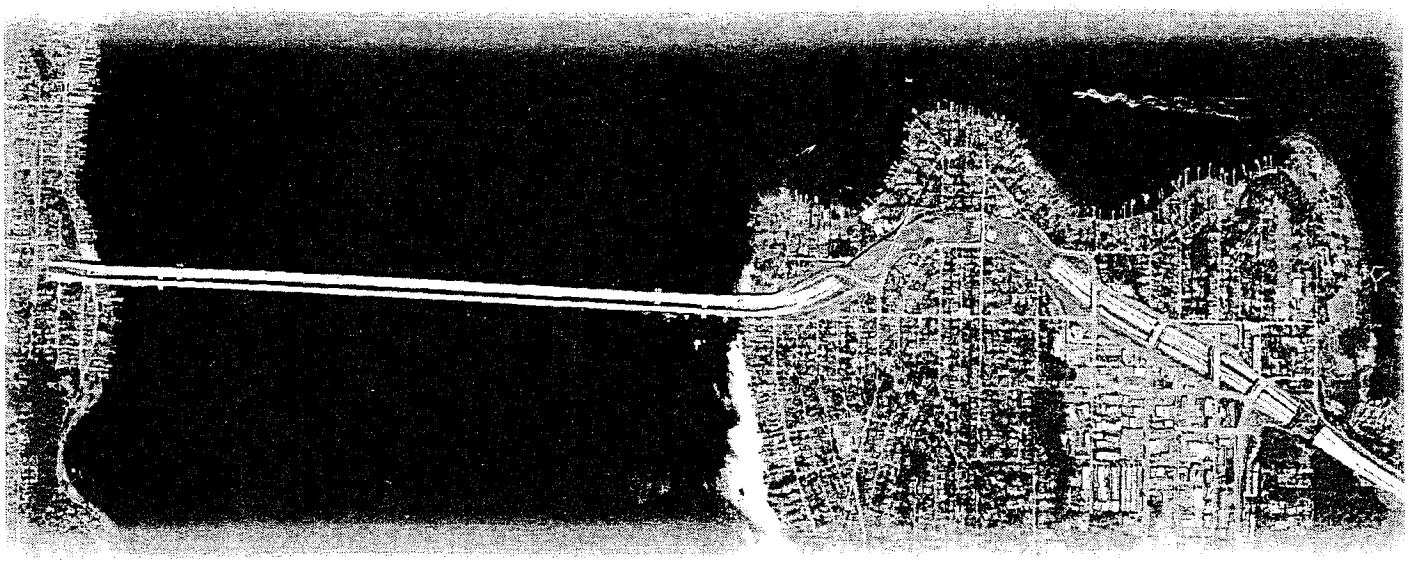
Eastbound traffic is shown to be primarily return trips from the westbound with no major differences. Juanita Drive (68th Avenue NE) is the destination for about 40 percent of the trips with the origins being well distributed from the south and north. Primary trunks to feed the corridor are I-5, SR 523 (NE 145th Street), and Ballinger Way.

2.2.7 Additional Measures of Transportation Performance

The report on existing conditions also provided available information for a variety of other system or facility performance measures. These include lane occupancy, travel speeds, average car and vehicle occupancy, and person throughput.

Trans-Lake Washington Study

3. Environmental Setting



3. Environmental Setting

This chapter describes natural resources and "built" resources in the Trans-Lake study area. Brief information on laws and regulations that protect these resources is provided. This background information was used to help frame the issues on the Trans-Lake study project. As part of the solution set evaluation process, to assist in future environmental study scoping, and in response to committee interests, project staff conducted an inventory of existing information that was available through the jurisdictions and agencies within the study area. The results of the inventory helped form the basis for the evaluation of solutions, the development of evaluation methods and criteria, and the evaluation of the potential solutions. Chapter 5 provides a summary of the environmental analysis results. Appendix 6 provides additional backup information.

The environmental issues in the Trans-Lake study area were divided into two categories. The "Built Environment" includes those features or qualities that arise as a result of human interaction. These are items such as homes, businesses, urban growth, land use, noise, and neighborhood traffic. Specifically, the built environmental effects evaluation included five measures of effectiveness:

- Arterial Traffic
- Noise
- Displacements
- Supports Growth Management Act Plans
- Physical Barriers

The natural environment is made up of geologic and ecological features generally associated with the health of flora and fauna. As part of this early phase of planning, five major categories of environmental impacts were identified as major discriminators. These were:

- Critical Areas
- Parks and Refuges
- Endangered Species Act (ESA) Issues
- Air Quality
- Water Quality

3.1 The Built Environment

The entire Trans-Lake Washington Study area is within the urban growth area (UGA) for King County. Under the GMA of 1990, the UGA defines where urban growth is to be encouraged and outside of which growth may occur only if it is not urban in nature. UGAs are sized to accommodate the next 20 years of growth. Any mobility solutions that are identified as part of the Trans-Lake Study would be consistent with the GMA provisions.

Growth trends in the study area indicate that areas on the western side of Lake Washington, along the I-5 and SR 522 corridors, are projecting lower growth rates than those areas east of the lake, along SR 520 and I-405. The overall growth projection for King County is 22 percent over the next 20 years. Many of the cities to the west of I-405 are considered near build-out, with additional growth expected through redevelopment and additional development.

3.1.1 Noise

Traffic noise is a major concern for many communities in the Trans-Lake study area. WSDOT has monitored noise levels on state highways and interstates for more than 10 years. Figure 3-1 shows noise-sensitive areas along the SR 520 study area, based on past WSDOT noise studies. The figure does not note all noise-sensitive receptors, but rather indicates areas with high numbers of noise-related complaints. The results of these studies and the database of noise-related complaints have helped identify the most problematic areas, which are listed below.

- SR 520, between I-5 and Lake Washington
- SR 520, from Lake Washington east through the Points Communities to Bellevue, and again from Overlake to Marymoor Park.
- I-5, between downtown and Green Lake, and again in the Northgate area
- I-405 corridor, between I-90 and SR 522

3.1.2 Land Use and Growth Management

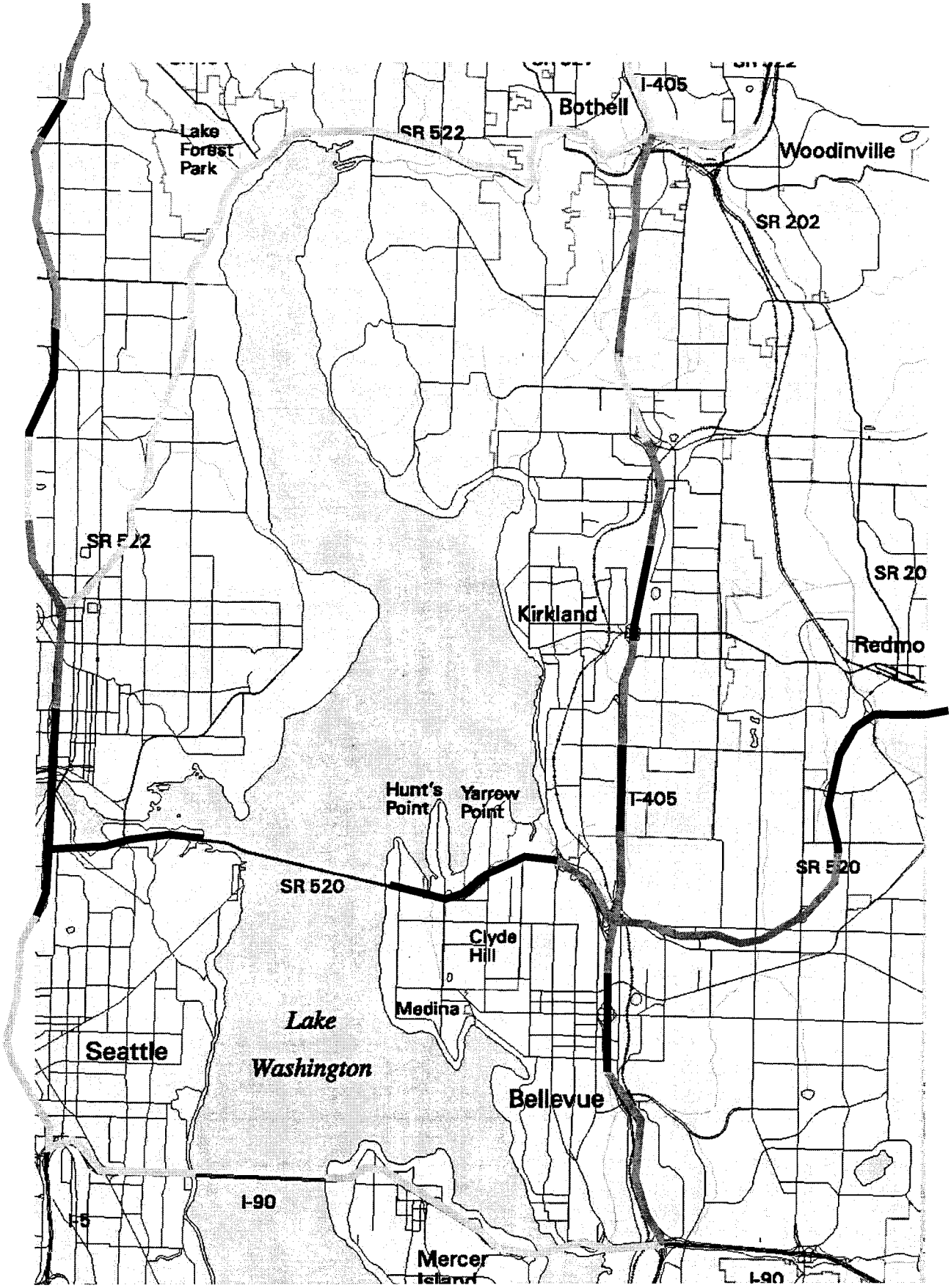
The planning framework for the Trans-Lake Washington Study was summarized in Chapter 1. Additional detail about the major planning documents affecting transportation conditions within the study area is provided below. These documents were considered when evaluating planning consistency of the draft solution sets.

3.1.2.1 Vision 2020

"Vision 2020 is the long-range growth management, economic, and transportation strategy for the central Puget Sound Region, encompassing King, Pierce, Kitsap, and Snohomish counties. It combines a public commitment to a growth management vision with the transportation investments and programs and economic strategy needed to support it. The vision is for diverse, economically and environmentally healthy communities, framed by open space, and connected by a high-quality multimodal transportation system that provides for effective mobility for people and goods" (Vision 2020, 1995 Update, PSRC).

Vision 2020 was first adopted in 1990. In 1993, Vision 2020 was amended to comply with GMA requirements. Vision 2020 was followed by the development of Countywide Planning Policies in King, Pierce, Kitsap, and Snohomish Counties, which in turn helped frame the development of county and city comprehensive plans, most of which were adopted in 1994.

The 1995 Update to Vision 2020 was performed to incorporate work from local comprehensive plans, countywide planning policies, and regional and state transportation plans for the area. The MTP was also updated at this time.



Source: King County GIS Technical Resource Center

Trans-Lake Washington Study

High (on statewide priority list)

Medium

Low

Figure 3-1
Noise

One of the primary strategies of Vision 2020 is to focus growth on multi-use centers, which have relatively compact development with housing, employment, shopping, and other activities nearby. The sizes of these centers range from major urban centers (such as downtown Seattle and Bellevue) that are regional attractions, to smaller sub-area and neighborhood centers. King County has designated five urban centers that fall within the Trans-Lake study area. Two others in King County and one in Snohomish County lie outside the study area boundary.

3.1.2.2 Comprehensive Plans

A review of comprehensive plans for the 14 jurisdictions in the study area indicates that most agencies have targeted specific districts for development and related infrastructure improvements. Most cities, like Seattle, Bellevue, Redmond, and Lake Forest Park, indicate a desire to preserve the character and "livability" of neighborhoods and residential communities and protect natural resources within their jurisdictions. To this end, an integration of land use and transportation is often cited as a critical element within planning documents to ensure that transportation supports each community's land use vision.

The study area includes the following designated urban centers:

- Seattle's Downtown Urban Center
- First Hill/Capitol Hill
- University District
- Downtown Redmond Urban Center
- Downtown Bellevue

Many of these centers are already significant centers of employment, but many of them are not yet major centers of housing, although most plan a significant addition of housing within their boundaries. Similarly, most of the centers have planned for higher densities of housing and job-related development.

Looking at the entire study area, the land uses and densities along the major regional corridors vary considerably, as do projections for population growth and new development. The following land use description is based on City and County Land Use Plans, as consolidated by PSRC.

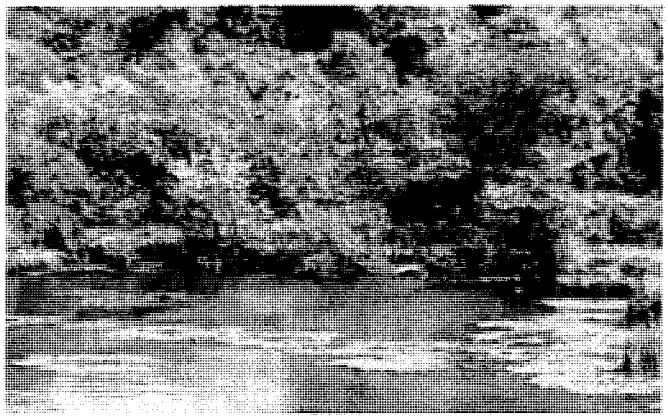
The land uses around SR 520 from I-5 to I-405 are primarily residential, with the exception for the UW campus in Seattle and several open space preserves (described in more detail below under parks and natural resources). The density of residential development is several units per acre higher on the Seattle side than the residential areas of the eastside communities of Yarrow Point, Medina, Bellevue, and Clyde Hill. East of I-405, the SR 520 corridor varies between residential, commercial, and industrial zones, with densities typically between 1 to 4 units per acre. Major sources of employment are found in the downtown Redmond urban center, and in several of the sub-areas of Bellevue and Redmond, including Overlake.

In the study area, I-5 traverses high-density portions of Seattle, which in many cases feature 12 units per acre under a range of land uses. The corridor includes multi-family and single-family residential zones, dense multi-use development downtown, and industrial and mixed-use commercial land uses in the Lake Union and University District areas.

Along I-90, the land uses include multi-family and single family residential on the Seattle side, with a general trend in housing densities decreasing in the residential areas of Mercer Island and Bellevue. Housing densities are typically in the range of 4 to 12 units per acre along the I-90 corridor. There are also mixed-use commercial zones along the corridor, but they tend to be concentrated in areas immediately adjacent to the highway.

The I-405 corridor includes the urban center of Bellevue downtown, which is mixed use, but also includes zones of single and multi-family residential. It also includes mixed use/commercial centers in Kirkland, Totem Lake, Bothell, and Woodinville. The densities vary considerably along the corridor. Residential areas have sections with densities of 4 to 12 units per acre, and others of 1 to 4 units per acre. The various mixed-use and commercial areas have mostly similar residential densities (1 to 4 units per acre), although some areas, such as downtown Bellevue and Kirkland have more than 12 units per acre.

The area surrounding the SR 522 corridor is primarily residential, although the corridor itself is banded by mixed use/commercial areas for much of its length. Somewhat larger mixed use/commercial areas are found immediately after the I-405 interchange, and in Kenmore and Seattle. The residential areas are primarily single-family residential, with multi-family areas closer to the highway. Housing densities range from 4 to 12 units per acre.



There are sensitive resource areas like this all around the lake, particularly near SR 520.

Growth over the next 20 years is planned to be distributed throughout the study area. Table 3-1 shows the planned housing unit target for each of the Trans-Lake study area jurisdictions together with the progress made towards reaching those goals over the first three years of the planning timeframe.

3.1.3 Physical Barriers

When SR 520 was constructed in the 1960s, several neighborhoods, particularly the Roanoke and Montlake neighborhoods in Seattle and the Points Communities of the Eastside, were divided as a result. Today, there are few crossings of the freeway in some areas where there was once unified neighborhoods. Additionally, there are few arterial connections to SR 520, and they are frequently congested, causing further barriers in the neighborhoods.

Table 3-1. Trans-Lake Housing and Employment Plans and Trends (1997)

City [1]	1990 Population	1998 Population	1995-1997 Total New Housing Units	20 Year New Housing Units Target 1992-2012	Percent of Household Target Met[2]	New Employment 1995-1997		20 Year New Employment Target 1992-2012	Percent of Employment Target Met
Seattle	516,259	539,700	6,860	50,000 to 60,000	12%	53,721		132,700	40%
Bellevue[4]	86,872	105,700	2,069	8,600	24%	10,339		28,250	37%
Shoreline	NA	50,390	309	NA	NA	1,363	[3]	NA	
Kirkland	40,059	44,220	1,472	5,328 to 6,346	25%	9,634		8,600	112%
Redmond[4]	35,800	43,310	1,471	9,878	15%	8,941		29,509	30%
Mercer Island	20,816	21,690	181	1,610	11%	765		1,700	45%
Bothell[4]	12,345	27,300	850	1,700	50%	1,359		2,900	47%
Lake Forest Park	3,372	12,800	32	153	21%	59		200	30%
Woodinville	NA	10,130	367	1,800	20%	452		1,950	23%
Medina	2,981	3,076	20	17	118%	46		0	
Clyde Hill	2,957	3,005	11	13	85%	39		0	
Yarrow Point	957	1,019	7	18	39%	46		0	
Hunts Point	514	523	3	4	75%	114		0	

Source: Office of Financial Management, Employment Security Department, Puget Sound Regional Council, King County Office of Budget and Strategic Planning, King County Growth Management Planning Council.

Population Estimates are for April 1, 1990 and 1998.

Covered employment is the number of jobs covered by state unemployment insurance. Corporate officers, railroad employees, and sole proprietors are excluded.

NA = Not Available

Notes:

(1) This table does not include Kenmore, which was incorporated after April 1, 1998.

(2) When the 20-year target is given as a range, the "Percentage of the 20-Year Target Met" is calculated using the middle of the range. In three years a jurisdiction would be expected to have met approximately 15 percent of its 20-year target.

(3) Represents new employment from 1996 and 1997.

(4) Redmond and Bellevue have both continued to increase employment levels; data shown represents employment through 1997.

(5) Housing units and employment figures include only King County portions of the jurisdiction.

3.2 Natural Environment

3.2.1 Critical Areas

Critical areas include land that is considered sensitive to floods, erosion, landslides, or seismic conditions. Any development disturbance in critical areas can be difficult to execute, permit, and mitigate. For example, the King County Comprehensive Plan indicates that no development should be allowed in the Swamp Creek floodplain between Kenmore and Bothell in order to protect the corridor.

Erosion is the most common feature of critical areas in the Trans-Lake study area. This condition exists along the shorelines of Bellevue, Medina, Kirkland, Holmes Point (north of Kirkland), and Lake Forest Park. Steep slopes in the City of Bothell comprise more than 20 percent of the City's planning area. Two other locations where critical slopes are an important factor are the southeast quadrant of the interchange of I-5 and SR 520 in Seattle and the northwest quadrant of the interchange of I-90 and I-405 in Bellevue. Floodplain and seismic hazards combine in the SR 202 corridor south of Woodinville and along SR 522 in Kenmore.

A major earthquake fault zone, the Seattle Fault, crosses east-west under Lake Washington following a similar path to I-90. The motion on the Seattle Fault is vertical. The magnitude 5.0 earthquake between Seattle and Tacoma on January 28, 1995 may have occurred on the Seattle Fault. The magnitude 5.5 earthquake on July 2, 1999 was not associated with the Seattle Fault.

3.2.2 Wetlands

Literally hundreds of wetlands exist in the study area. In addition to providing essential habitat for fish and wildlife, wetlands perform many important hydrological functions, such as flood water storage and groundwater recharge. Wetlands also improve water quality and can help stabilize soils along a shoreline. Many of the wetlands in the Trans-Lake area are associated with public parks and trails. These wetlands provide yet another function as valuable educational and recreational resources for the community.

Some of the larger wetland systems are found in Juanita Bay and Totem Lake in Kirkland, Yarrow Bay, the Mercer Slough, Swamp Creek, the UW Arboretum/Foster Island area, and in multiple locations along the Sammamish Slough. Extensive wetlands are also found at the headwaters of Bear Creek and Cottage Lake Creek.

Activities associated with wetlands are regulated by federal and state agencies as well as local governments. Some jurisdictions within the study area, such as the City of Bellevue, have indicated in planning documents that specific wetland resources should be preserved and protected from development. The Army Corps of Engineers (Corps) and Washington State Department of Ecology (WSDOE) have "no net loss" policies in place with respect to wetlands.

3.2.3 Endangered Species Act (ESA) Issues

There have been major changes in the ESA listing status of two species since the study began. The National Marine Fisheries Service in 1999 listed the Puget Sound Chinook salmon as a threatened species. The impact of this listing has already been felt, with numerous transportation and development projects delayed since the beginning of the year. Any transportation improvements in the Trans-Lake Washington Study area will require scrutiny of the impact on salmon migratory routes and spawning habitats, which include Lake Washington and most watercourses in the study area.

Habitat for salmon and other anadromous fish species is found throughout the study area. Migrating species of Chinook, Coho, Sockeye salmon, and Steelhead trout are found in Lake Washington, primarily during the fall months, and live in the surrounding watersheds at varying times throughout the year.

Among the dozens of rivers and streams used for migration and spawning, several are considered critical fish habitats, including the Sammamish River and its tributaries (Bear Creek and North Creek), Juanita Creek, and the Mercer Slough. In addition, large patches of shoreline in Lake Washington and Lake Sammamish are recognized as habitat areas for threatened priority species of salmon. These habitat areas include both sides of the Montlake Cut, the shorelines of Hunts Point and Yarrow Bay, the shoreline between Juanita and Kenmore, virtually all the shoreline of Mercer Island, and the Bellevue shoreline from Meydenbauer Bay to the East Channel Bridge.

The second major change is that the bald eagle was recommended to be removed from the Endangered Species List. There are several identified bald eagle habitats near SR 520 and the other facilities that were examined. The exact impact of this action on any of the SR 520 Solution Sets examined is not known, but all of the Trans-Lake alternatives have some portion of new or reconstructed roadway or light rail in a bald eagle habitat.

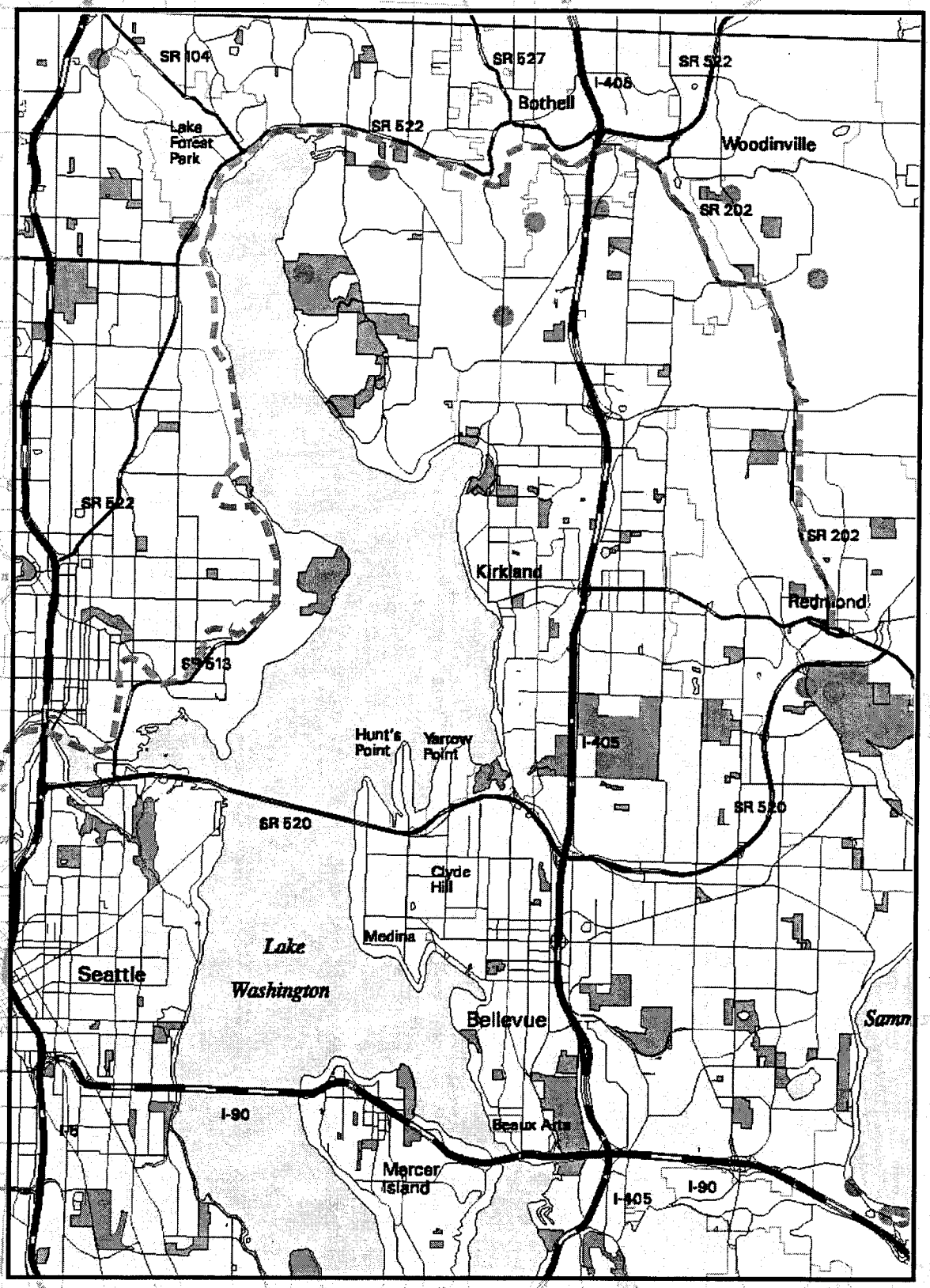
3.2.4 Parks and Refuges

Numerous recreational facilities are located in the study area. These include parks, play fields, neighborhood playgrounds, and bicycle and pedestrian trails. The most prominent parks in the study area include Bridle Trails State Park, Edwards State Park, Marymoor Park, Mercer Slough Nature Park, Kelsey Creek Park, Warren G. Magnuson Park, Washington Park Arboretum, the Burke-Gilman Trail, and the Sammamish River Trail system.

Section 4(f) of the Department of Transportation Act preserves publicly owned parklands, waterfowl and wildlife refuges, and historic sites. Under this law, Trans-Lake study alternatives must avoid these protected areas, unless it is not feasible and prudent, and must include all possible planning to minimize harm. The major lands in the Trans-Lake Washington Study area are the Mercer Slough Nature Park, Yarrow Bay wetland and the Wetherill Nature Preserve. Figure 3-2 shows a summary graphic of parks, trails, and historic sites, which was provided to the committee through presentations and the Existing Conditions Information Report. Figure 3-3 shows sensitive areas, including refuges. The geographical information system (GIS) source maps used for solution set evaluation show more detail and are reproduced in Appendix 5.

3.2.5 Air Quality

The Trans-Lake Washington Study area is subject to the state and local ambient air quality standards adopted by the WSDOE and the Puget Sound Air Pollution Control Agency (PSAPCA). These standards are equivalent to National Ambient Air Quality Standards, which identify pollutant concentrations that are not to be exceeded over specified time periods. These standards are defined for the protection of public health and to protect the natural environment. The major airborne pollutants of interest in the central Puget Sound region include carbon monoxide (CO), particulate matter, ozone, and ozone precursors.

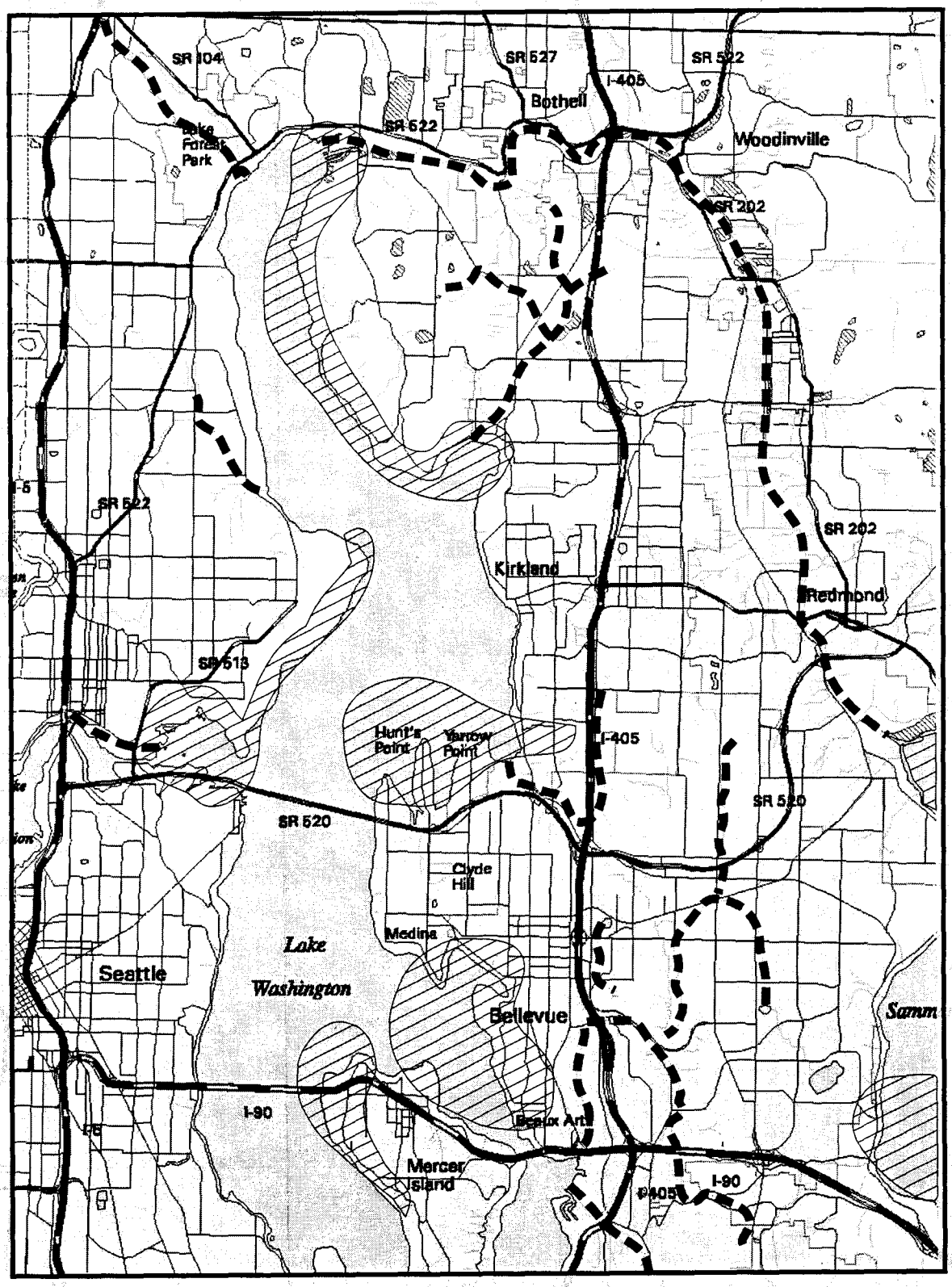


Source: King County GIS Technical Resource Center

Trans-Lake Washington Study

= Parks
= Water Bodies
= Cities
= Burke Gilman/Sammamish Lake Trail
= Historic Resources

Figure 3-2
Parks, Trails & Historic Resources



Source: King County GIS Technical Resource Center

Trans-Lake Washington Study

= Priority Species Habitat
= Critical Fisheries Habitat
= Farmland Preservation Areas
= Wetlands Inventory

Figure 3-3
SensitiveAreas

The central Puget Sound is designated by the United States Environmental Protection Agency (EPA) as being in attainment for all pollutants except particulate matter, and the EPA is expected to redesignate to attainment for that pollutant. Within the past two years, areas in the region were redesignated from non-attainment to attainment for ozone and CO, and these areas are considered "maintenance areas" for these pollutants. Transportation projects in maintenance and non-attainment areas must meet "conformity" requirements imposed by the CAA and the Clear Air Washington Act (CAW) of 1991. Federally-funded transportation projects must conform with the SIP for meeting and maintaining compliance with the federal standards; these projects must not produce new air quality violations, worsen existing violations, or delay timely attainment of the federal standards. The Washington State Air Conformity Rule further states that federal, state, and local transportation funds shall be used only on projects that improve, or do not worsen air quality.

In spite of the recent improvements in air quality, the Puget Sound area remains on the brink of non-attainment. The region's air quality performance has improved over the last decade, largely as a result of lower vehicle emissions and tighter controls on sources for particulate matter. Higher standards have been established, although new federal standards have not yet been implemented. Other factors may reverse this trend. With more motor vehicles traveling on the region's roadways, and with more trips of greater distance, the PSRC estimates that emission levels may turn upward as early as 2005, which could threaten attainment status for certain pollutants.

3.2.6 Water Quality

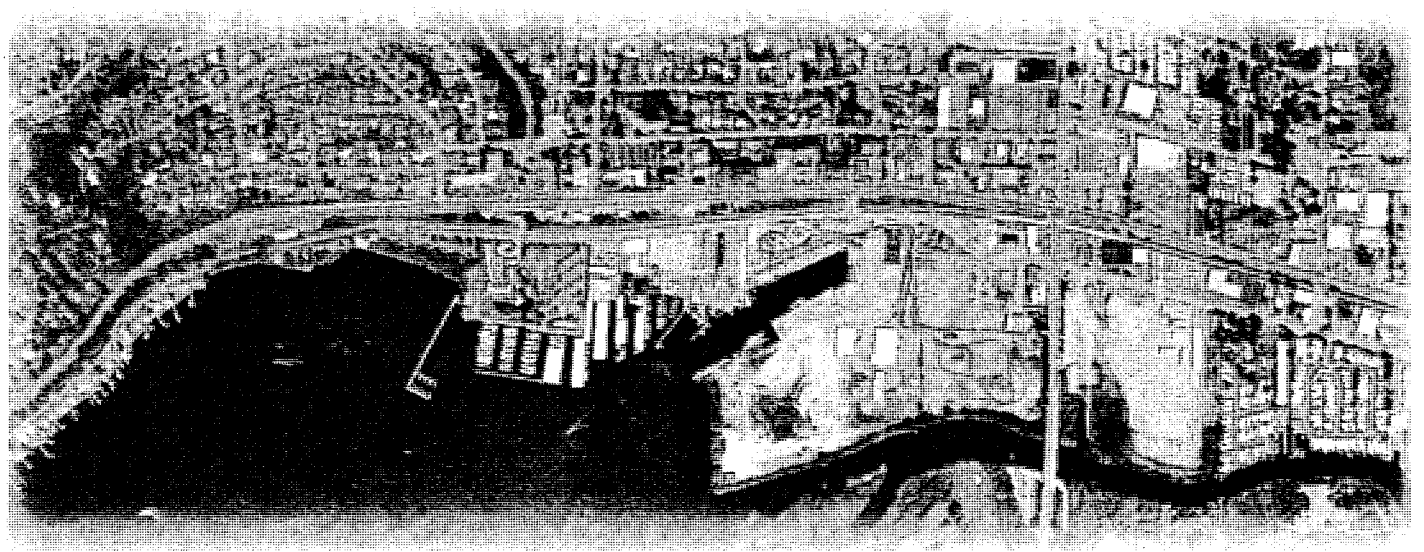
Water plays an important role in the Trans-Lake Washington Study area. Lake Washington is the largest lake in western Washington and the most dominant water feature in the study area. The Shoreline Management Act of 1971 designated all of Lake Washington/Union Bay as a "Shoreline of Statewide Significance." This classification helps to ensure protection of the resource and holds special conditions for development.

The streams and rivers that feed into Lake Washington are part of the Cedar-Sammamish Watershed. The most prominent river system in the Trans-Lake study area is the Sammamish River, which travels from Lake Sammamish through Redmond, Woodinville, Bothell, and Kenmore before emptying into Lake Washington. Another major tributary, the Cedar River, is found at the south end of Lake Washington and is an important destination for fish migrating through the project study area.

Just north of Marymoor Park, Bear Creek connects to the Sammamish River. The Bear Creek Basin has been identified by King County's Waterways 2000 Program as one of the top six aquatic resources in the County. Efforts are underway to preserve and enhance the fish and wildlife population in the basin. Figure 3-3 shows the general mapping of these sensitive areas and were provided to the committee in presentations and in the Existing Conditions Information Report. The GIS source maps used for the evaluation of solutions, which provide more detail, are shown in Appendix 6.

Trans-Lake Washington Study

4. Steps Toward Identifying Potential Solutions



4. Steps Toward Identifying Potential Solutions

The recommendations of the Trans-Lake Washington Study Committee were drawn from over a 100 suggested actions and strategies that had been developed through the course of the 14-month study. The committee-based study structure allowed members of the community and area jurisdictions to directly influence the types and emphasis of potential solutions. The committee's comments, questions, directions and discussion helped define the scope of the Trans-Lake problem, and their efforts identified and refined a wide range of approaches that could be taken.

From the earliest stages of the study, committee members determined that any potential solution should be considered in a system-wide context. Different actions, depending on how they were combined or where in the study area they were placed, could produce different effects on the individual corridors, the overall system, and the communities throughout the study area. The challenge of the study, given its large area and the complexity of its transportation system, was to develop solutions that address specific local issues as well as system-wide concerns. As outlined in the process chart in Chapter 1, the committee took a several stage approach to accomplish this task. Through the fall and winter, Study Committee members developed potential projects, strategies, and other actions (called "concepts" in this study) to address mobility problems in the Trans-Lake area. Then they identified the concepts they wanted to have further developed and evaluated as part of potential solution sets.

The committee's decision-making approach and the major steps it took to make its recommendations is described in the section below. Subsequent sections describe how potential solutions were suggested, refined, and evaluated.

4.1 Concept Development and Review

At the September 2, 1998 meeting, committee members brainstormed an extensive list of "concepts," or ideas that could be packaged together to form complete solutions later in the study. The technical team consolidated the list, included other concepts proposed previously through public input and other studies, and developed descriptions of the concepts. The concept listing and descriptions were reviewed by committee members and other study participants, and concept descriptions were revised or clarified in response to comments.

The concepts considered are shown by type in Figures 4-1 through 4-3. The types of concepts were based on mode, facility, or area of strategic emphasis. A complete list of concepts considered by committee members in developing the solution sets, along with the results of a review by project staff, is provided in Appendix 6.

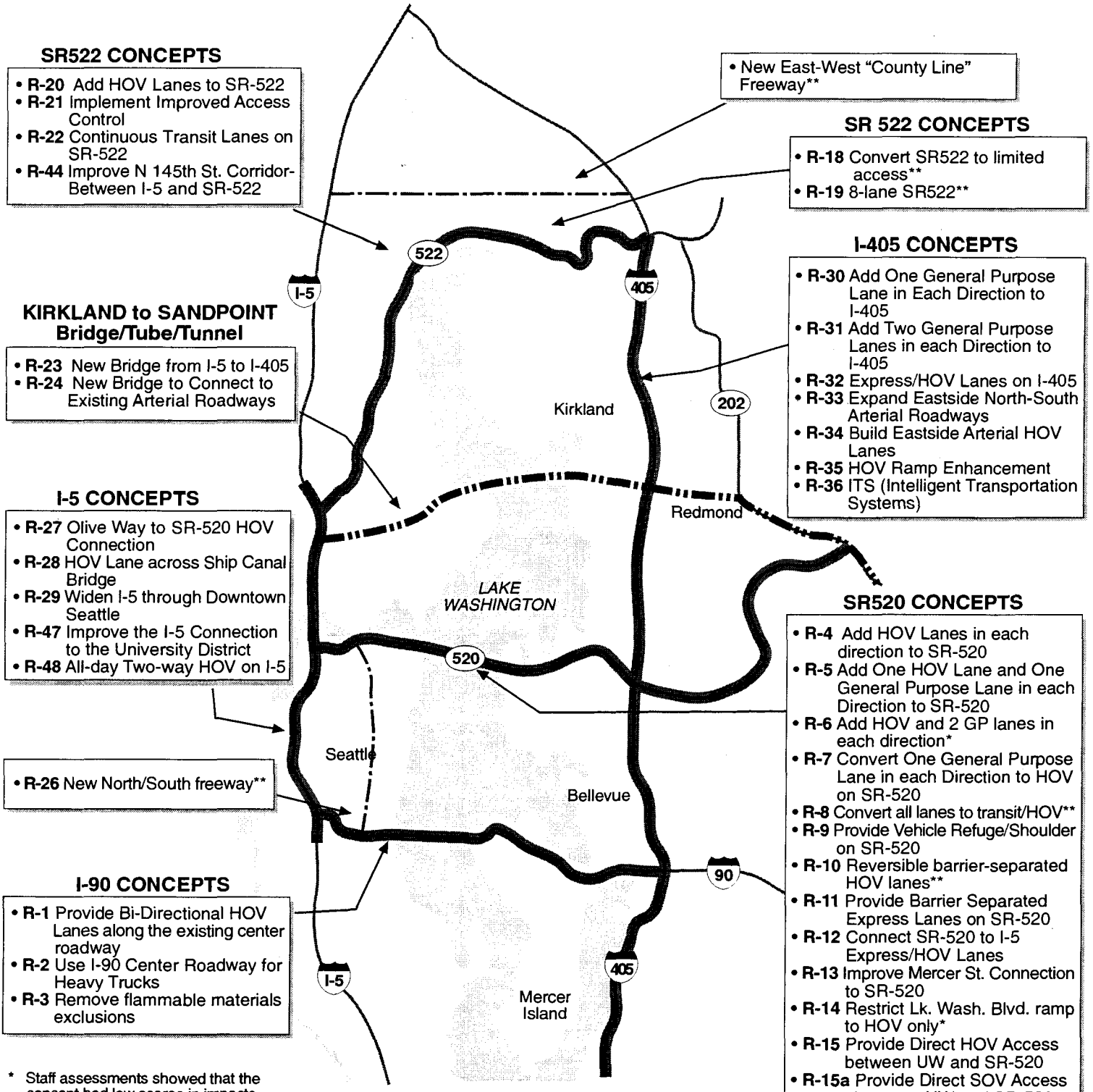


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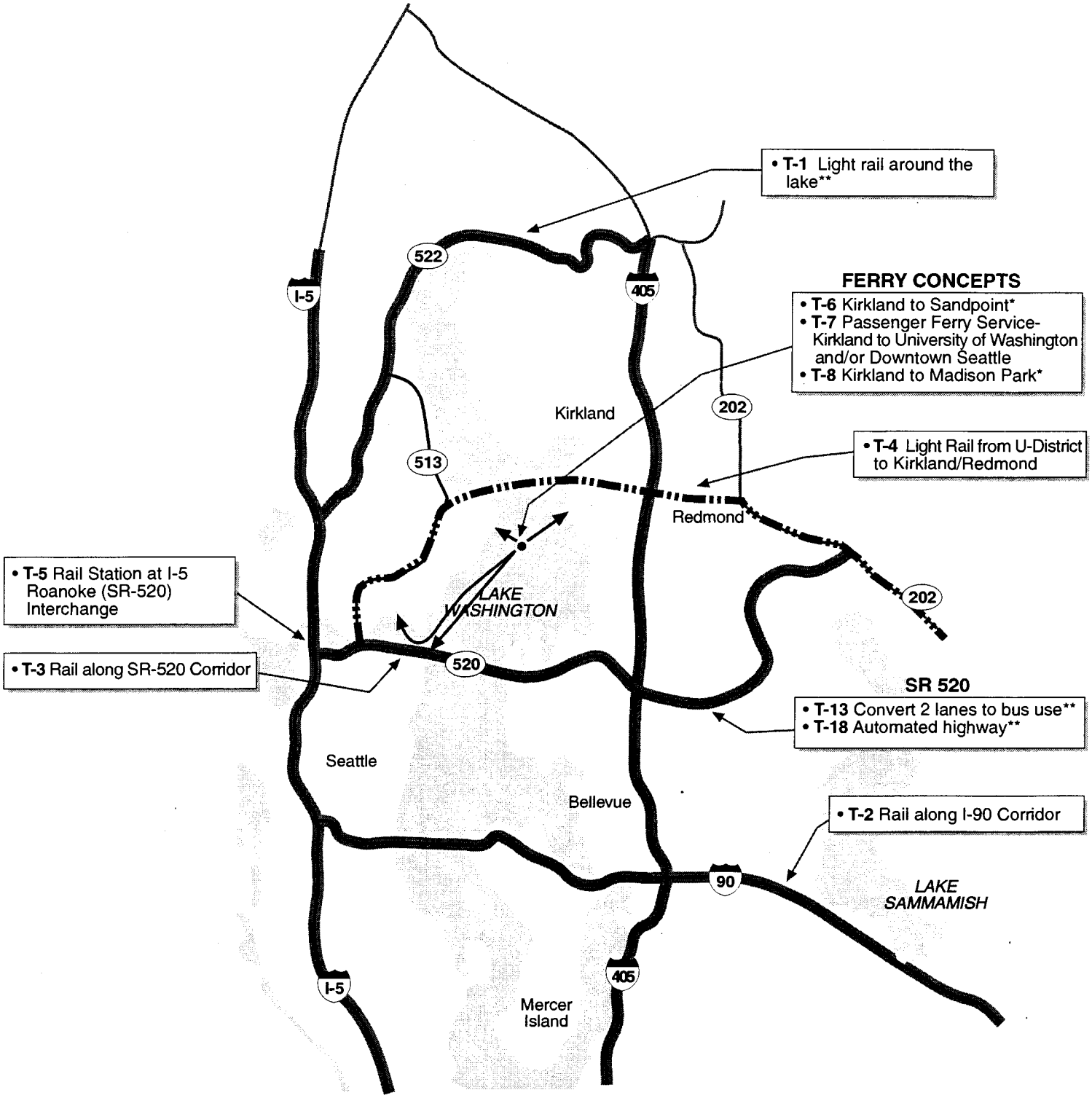
Figure 4-1
Roadway Concepts Considered



REGIONAL BUS/TRANSIT CONCEPTS

- **T-9** Improved Express Service
- **T-10** Improved "Reverse commute" service (SR-520)
- **T-11** Improved Transit Service
- **T-14** Transit Priority on SR-522
- **T-15** Connect Park and Ride Lots to Activity Centers
- **T-16** Bus-Only Lanes on I-5 and in Dedicated Right-of-Ways
- **T-17** Personal Rapid Transit

* Staff assessments showed that the concept had low scores in impacts, effectiveness or costs.

** Staff assesments showed that the concept did not significantly address Trans-Lake mobility, or it did not appear reasonable. Due to engineering feasibility, or low scores in impacts, effectiveness and costs.

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Figure 4-2
Transit Concepts Considered

CTR/RIDESHARING CONCEPTS

Incentives for CTR/Ridesharing:
- Parking Cash Out
- Transit Subsidies
- VanPool Subsidies
- Other Monetary Incentives
- Employer Provide Alternative Hours

LAND USE CONCEPTS

- Promote jobs/housing balance (incl. jurisdictional fees)
- Enforce Concurrency
- Increase Density in Centers
- Intergovernmental Strategies for Livable Community
- Maximize Transit Oriented Development

TRANSPORTATION PRICING CONCEPTS

- $1/Gal. Gas Tax
- Parking Pricing
- Tolls
- Congestion Pricing

OTHER TDM CONCEPTS

- Ration Use of SR520

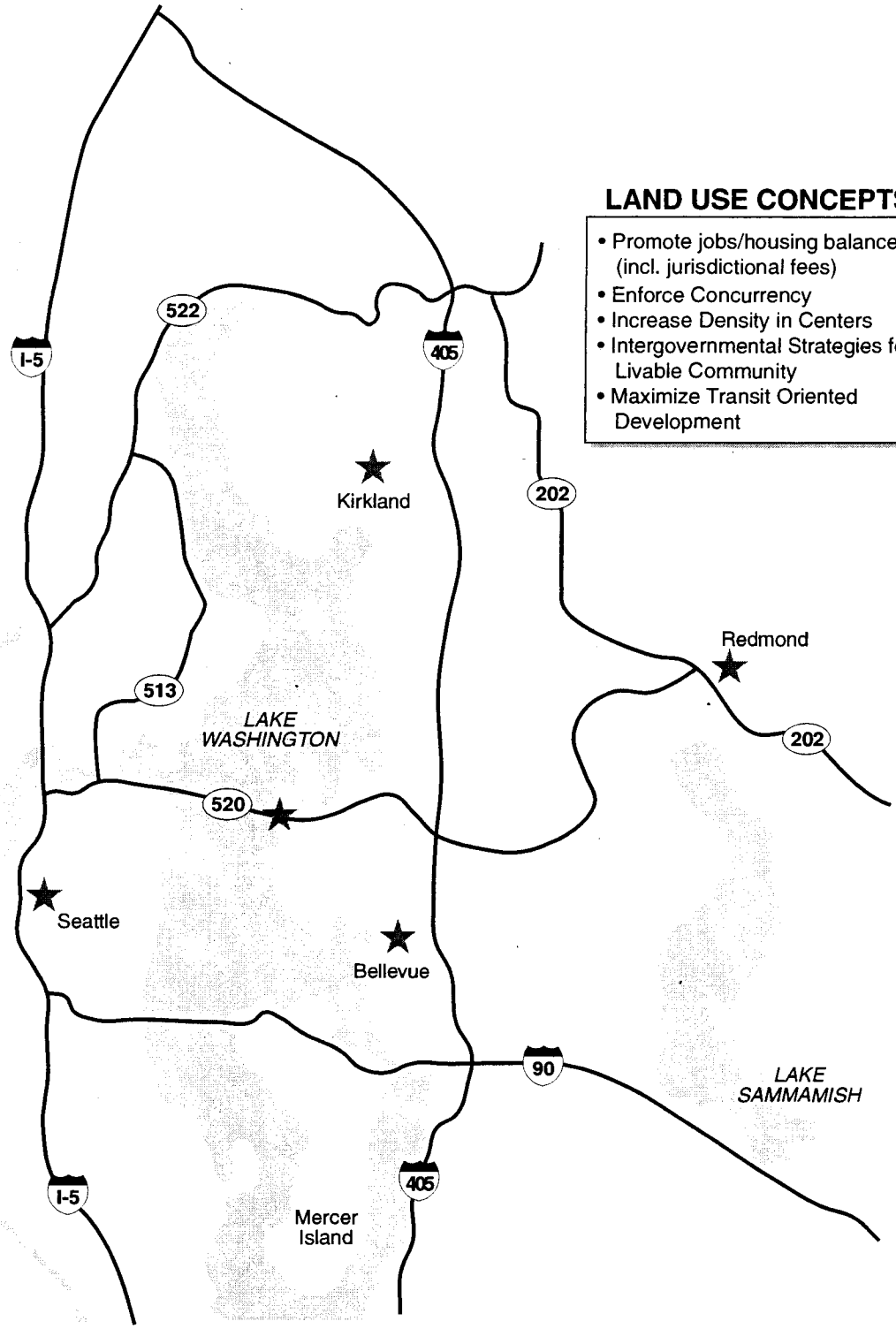

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Figure 4-3
Demand Management and Land Use Concepts Considered

4.1.1 Concept Review

Project staff performed an initial screening of the consolidated list of concepts (Concepts: Consolidation and Descriptions, September 1998) that had been reviewed at the October 1998 Study committee meeting. A number of new concepts that had subsequently been suggested for study by committee members were also included in the screening. The technical team conducted the review to help the committee determine which concepts were most promising candidates to be included in potential solutions sets, where they would undergo more detailed study. The results of the staff review were provided to the committee at its November 4, 1998 meeting.

As part of the concept review, project staff provided three groupings of concepts:

- **Concepts to be Further Evaluated** – Project staff provided a table of the remaining concepts, including brief notes on their effectiveness and areas where further study would likely be needed.

- **Concepts Not Recommended for Further Study** – A listing of 21 concepts which staff did not recommend for further study. The list provided each concept's performance scores, and briefly explained the factors the technical team considered in their recommendation. Several of the concepts were recommended for further discussion by the Study Committee. Ultimately, a number of the concepts in this grouping were included in the solution sets later selected by the committee for further study.

- **Concepts Not Screened** – A number of concepts were not evaluated because staff review had found they would not address Trans-Lake Washington Study issues, or they were not considered reasonable or appropriate options. In response to committee requests, this list provided further justification for the concepts that had not been evaluated.

For screening, the concepts in the Roadways and Transit categories were assessed in terms of effectiveness, impacts and cost. Concepts in Enhancement and TDM/Land use categories were reviewed for overall performance, and the team recommended that all the concepts in those two categories should continue for further study.

The performance marks for the concept reviews were made on a 5-point qualitative scale. (Best = ● ◕ ◑ ◔ ○ = Worst). This same type of scale was utilized in the review of solutions. The more of the circle that was filled in, the better the mark. The typical rating rationale for each of the three category areas was:

Effectiveness	Impacts	Cost (considers cost range for all concepts)
● = Best at improving Trans-Lake mobility	● = Comparatively few impacts	● = Lower 1/5 range of costs, or to 20th percentile
◕ = Good at improving Trans-Lake mobility	◕ = Some impacts likely	◕ = 20 to 40th percentile
◑ = Moderate improvement to mobility	◑ = Impacts likely in several areas	◑ = 40th to 60th percentile
◔ = Some improvement to mobility	◔ = Higher impacts in many areas	◔ = 60th to 80th percentile
○ = Little to no improvement to mobility	○ = Very high and unavoidable impacts	○ = Top 1/5 in costs

Concepts were screened only in comparison to other concepts in their category. Poor marks for effectiveness and impacts were typically the primary reasons behind a recommendation to drop a concept. Costs, which are on a scale that considers all categories of concepts, were only considered a factor if a concept performed poorly under other criteria.

The initial screening was done based on existing information on transportation and environmental conditions in the study area, combined with the professional opinion of the evaluation team, which included senior engineers and planners who specialize in regional planning, transit, transportation planning, highway design, or environmental planning. The team then conducted additional review of the concepts that were not being recommended for further study to ensure that there was adequate justification for the lower marks assigned to the concept. This information is included in the documentation provided in Appendix 1.

The committee members were provided with the results of the staff assessment of concepts, along with a set of recommendations for next steps. In several cases, staff recommended that some concepts be eliminated from further consideration, and provided justification based on effectiveness, input or cost considerations. Although committee members considered these recommendations, they decided that most of the concepts should remain available for use in potential solution sets, which they were then beginning to formulate.

4.2 Developing Strategic Approaches

In their two November 1998 meetings, the committee members participated in a series of workshop exercises to focus on concepts and potential system-wide strategies. Committee members formed smaller "roundtable" workgroups, each of which was supported by a technical staff member. Participants discussed the potential benefits of the concepts, and developed system-wide strategies that could guide the way that concepts could be grouped as part of an area-wide solution. Staff then consolidated the strategies into suggested groups for further committee review. The strategy groups are shown in Table 4-1. The themes of the solution sets were similar in that they nearly all involved a multimodal approach, although the modal emphasis and the concepts that committee members selected to fit the strategy varied. The elements of the solution sets included land use, TDM, pedestrian and bicycle mobility, transit, carpools and vanpools, and general-purpose (SOV), and freight travel.

Table 4-1. Draft Suggested Consolidated Strategies for Addressing Trans-Lake Problem Statement	
Roadway/Bus Focus Emphasizes stronger commitment to current modes in general-purpose and transit • More roadway capacity for SOV and freight • Strengthens bus options as the primary transit mode (no rail on I-90)	**Compared to MTP** • General-Purpose ↑ • Bus Transit ↑ • Rail ↓
Everything and Heaven Too Sees the problem as bigger than MTP can solve and adds emphasis in virtually every category	**Compared to MTP** • General-Purpose ↑ • HOV ↑ • Rail ↑ • Land Use Coordination ↑
Metropolitan Transportation Plan (MTP) Remember, it goes well beyond present actions and includes: • Land use more concentrated in activity centers • Strong emphasis on increased transit and increased car pool/van pool	**Compared to MTP** • All elements = Specifically includes: HOV lanes across SR 520 (candidate) Light rail across I-90 to Bellevue/ Overlake
Adding Rail to the Eastside Would add rail to the Eastside as a stronger substitute for the MTP's proposed bus emphasis • Complemented with stronger emphasis on land use density in rail-served areas	**Compared to MTP** • Rail ↑ • Land Use Coordination ↑
Maximizing Alternative Choices Starting with a land use and TDM premise, including congestion pricing for TDM • Added HOV system to provide for ridesharing tools and buses • Added rail in key Eastside corridors • Possible part-time or permanent general-purpose land conversion	**Compared to MTP** • Rail ↑ • Congestion Pricing ↑ • Land Use Coordination ↑ • General-Purpose ↓

4.3 Developing and Selecting the Solution Sets to be Evaluated

The committee ultimately selected seven solution sets, including a No Action solution set and six additional sets they formulated through the course of several meetings. Project staff, working with committee input, had initially drafted ten potential solution sets, several of which had similar elements but had different arrangements or strategies attached. Through the course of several meetings, the committee members worked with project staff to consolidate solution sets that had similar approaches, and they made other comments to clarify or adjust the arrangements of specific solutions sets.

All of the solution sets were structured along the strategic themes provided by the committee through meeting exercises in November (1998). Committee materials provided from November through February clearly show the iterative process that was

used to refine the strategies, match them with potential groups of concepts, and then develop and refine solution sets. During that time, committee comments focused on requests for more information and refinement to specific project improvements, and to other elements such as land use, TDM, bus transit, and mitigation and enhancement. With the definitions approved by the committee, the project's technical staff refined technical details of the solution sets in order to allow costs, performance, and impacts to be assessed. Those conceptual design details are provided in Appendix 2. The solution sets are summarized below, and the major elements of each solution set are shown in Figures 4-4 through 4-10:

- **No Action** – Only funded improvements for the regional transportation system were assumed. A bridge rehabilitation project to replace pontoons would be needed in 20 years. No additional transit services, HOV, or general-purpose facilities would be added across the lake, beyond those now being implemented. TDM programs would remain at their current levels.

- **MTP '98** – A solution set with the improvements and strategies at the level proposed in the 1995 MTP, but updated to reflect details of Sound Transit's *Sound Move* program and its long-range strategy. The primary improvements include light rail across I-90 and HOV system improvements on SR 520. This solution set also defined the level of TDM programs that would be assumed in most other solution sets.

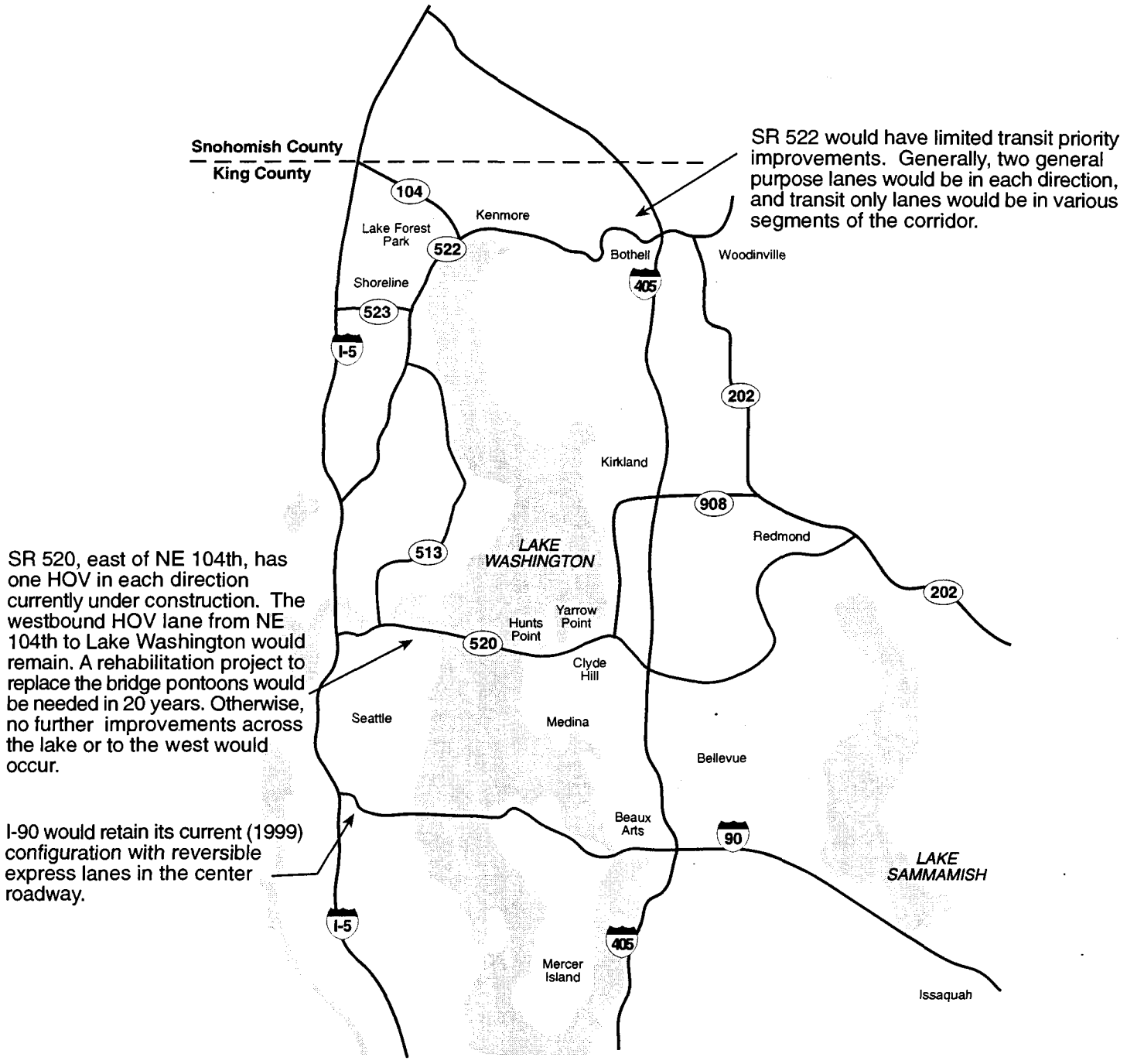
- **MTP Flipped** – A solution set with the same level of improvements as MTP '98, but with light rail on the SR 520 corridor, in accordance to the HOV lanes. The center lanes on I-90 would be reconfigured to allow continuous two-way operation.

- **Roadway/Bus** – A solution set that combines highway capacity expansion and new HOV lanes. The major elements are a new freeway between I-5 and I-405 and doubling the size of SR 520 by adding one HOV lane and one general-purpose lane in each direction. SR 522 would have continuous HOV lanes. Rail improvements would not be provided across the Lake, but a bus ferry would connect Kirkland with the base of the University District.

- **Roadway/Rail** – A solution set that adds new highway capacity and provides two rail crossings across the Lake. The major elements added general-purpose lanes (one each way) to SR 520 with rail also in the corridor. I-90 would also provide a rail crossing.

- **New Crossing** – A solution set with a number of the same elements as other sets, but in different locations. A new arterial and rail crossing would connect the Kirkland and Sand Point areas, and I-90 would also have rail. SR 520 would add HOV lanes, and SR 522 would use transit lanes and other treatments.

- **Maximize Alternatives** – A solution set with a heavy emphasis on using TDM strategies to discourage SOV use, while increasing the investment in alternative modes. Tolls and increases in parking fees were assumed. A largely grade-separated rail line would cross I-90, connecting with additional lines on the eastside. On SR 520, one general-purpose lane would be converted to HOV.



Regional Express and Local Bus Services would connect major centers in region via SR 520, I-90, SR 522, I-5 and I-405, with average frequencies between 7 and 12.5 minutes at peaks. Local transit service levels would increase slightly above current levels.

Moderate-level TDM programs and land use plans continue to support a shift from single-occupant vehicle use to alternative modes such as transit.

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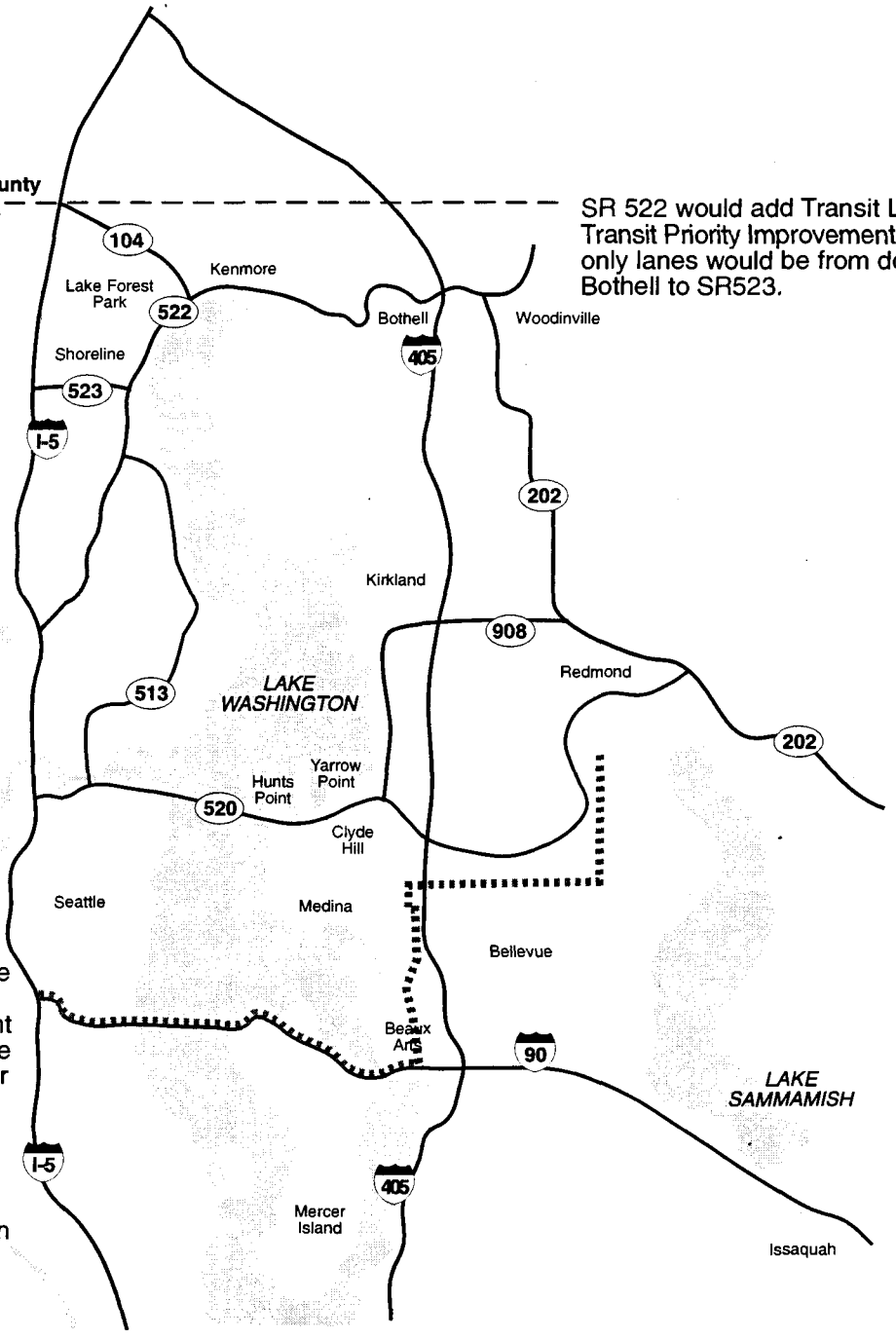
Figure 4-4
No Action Solution Set Key Elements



SR 522 would add Transit Lanes and Transit Priority Improvements. The transit only lanes would be from downtown Bothell to SR523.

SR 520 would add one HOV in each direction, with a direct connection to I-5 express lanes, and HOV-to-HOV direct access connections to I-405.

Light rail from downtown Seattle to downtown Bellevue to Overlake. I-90 would include light rail to Bellevue and Overlake. The center roadway would no longer be available to other vehicles, including buses or HOV.

A north/south light rail line connecting downtown, the U. District and points north and south was assumed.

Regional Express and Local Bus Services would connect major centers in region via SR 520, I-90, SR 522, I-5 and I-405, with average frequencies between 7 and 12.5 minutes at peaks. Local transit service increases about 20% above current levels.

Aggressive-level TDM programs and land use plans would continue to support shifts from single-occupant vehicle use.

Neighborhood Enhancements, Mitigation, and Non-Motorized facilities were to be determined.

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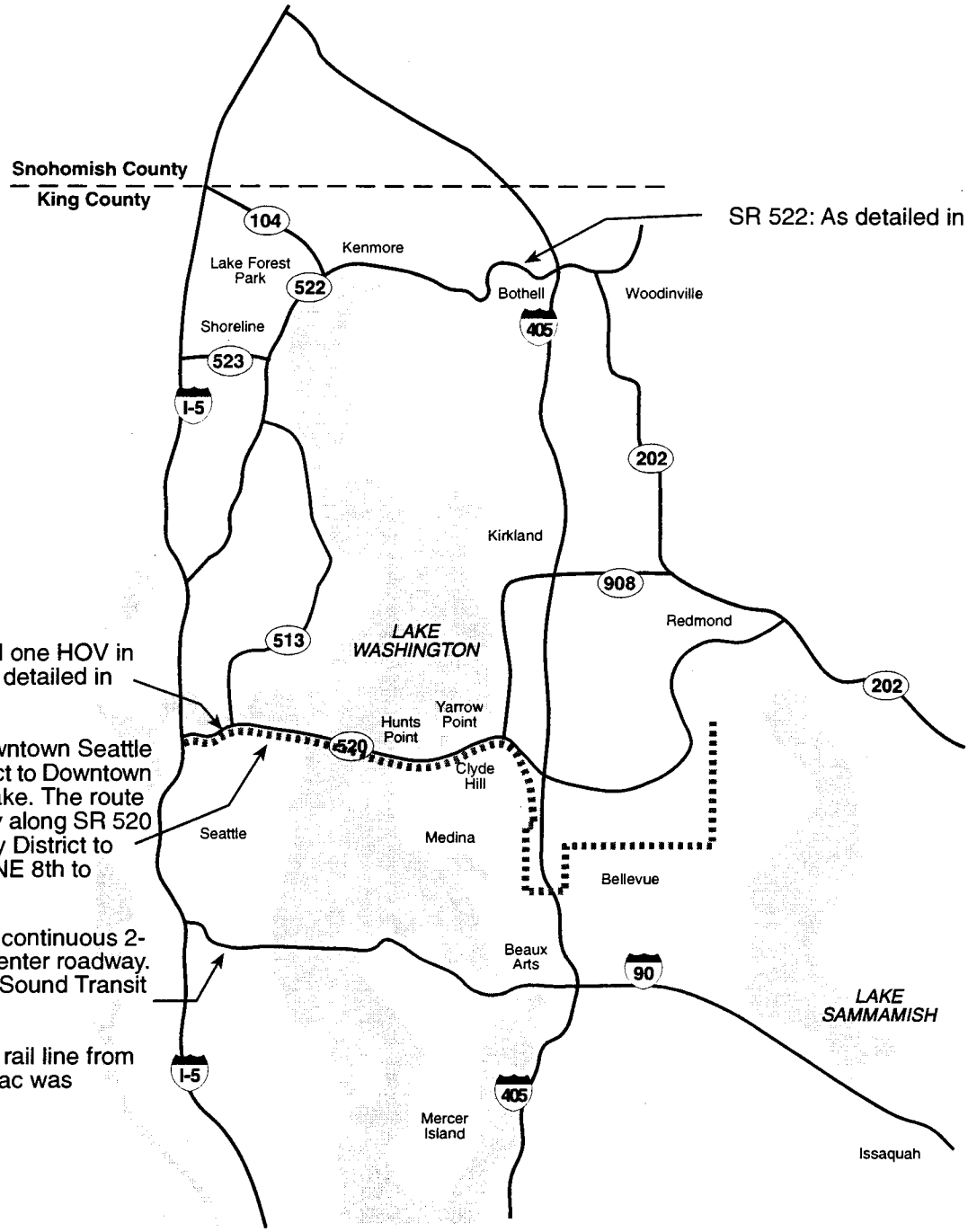
Figure 4-5
MTP '98
Key Elements



SR 522: As detailed in MTP '98

SR 520 would add one HOV in each direction (as detailed in MTP '98)

Light rail from Downtown Seattle to University District to Downtown Bellevue to Overlake. The route would be generally along SR 520 from the University District to Bellevue, and on NE 8th to Overlake.

I-90 would have a continuous 2-way HOV on the center roadway. (Details based on Sound Transit study.)

A north/south light rail line from Northgate to SeaTac was assumed.

Regional Express and Local Bus Services: as detailed in MTP '98

TDM and land use: as detailed in MTP '98

Neighborhood Enhancements, Mitigation, and Non-Motorized facilities were to be determined.

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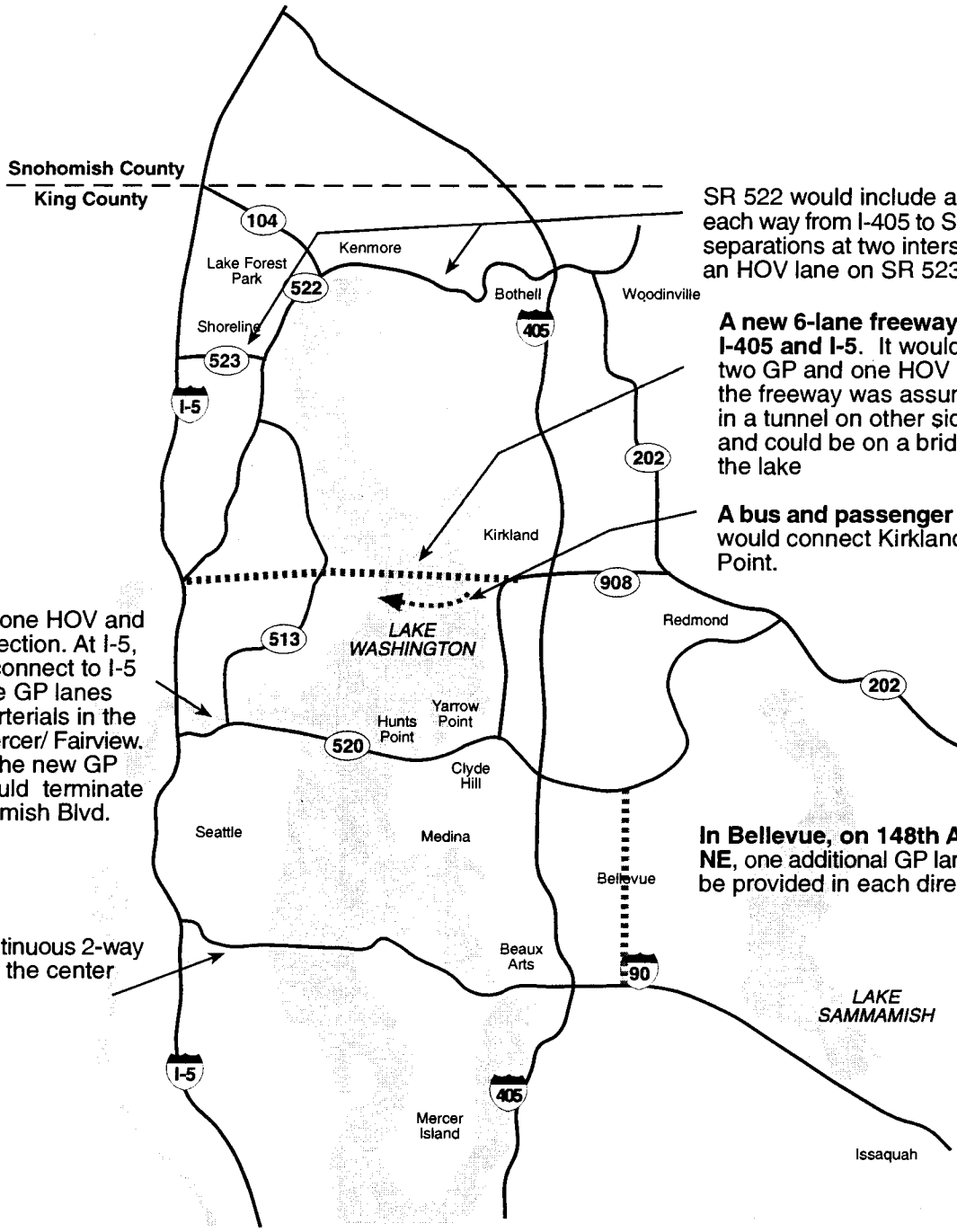
Figure 4-6
MTP "Flipped" Solution Set Key Elements



SR 522 would include an HOV lane each way from I-405 to SR 523, grade separations at two intersections, and an HOV lane on SR 523.

A new 6-lane freeway between I-405 and I-5. It would provide two GP and one HOV each way; the freeway was assumed to be in a tunnel on other side of lake, and could be on a bridge across the lake

A bus and passenger only ferry would connect Kirkland to Sand Point.

SR 520 would add one HOV and one GP in each direction. At I-5, HOV lanes would connect to I-5 express lanes. The GP lanes would connect to arterials in the U. District and at Mercer/ Fairview. On the east side, the new GP and HOV lanes would terminate at W. Lake Sammamish Blvd.

In Bellevue, on 148th Avenue NE, one additional GP lane would be provided in each direction.

I-90 would have continuous 2-way HOV operations on the center roadway.

Regional Express and Local Bus Services would be at same levels as in MTP '98, with restructuring to provide feeder service to SR 520 and I-90 express bus route corridors.

TDM and Land Use programs would be the same as MTP

Neighborhood Enhancements, Mitigation, and Non-Motorized facilities remain to be determined.

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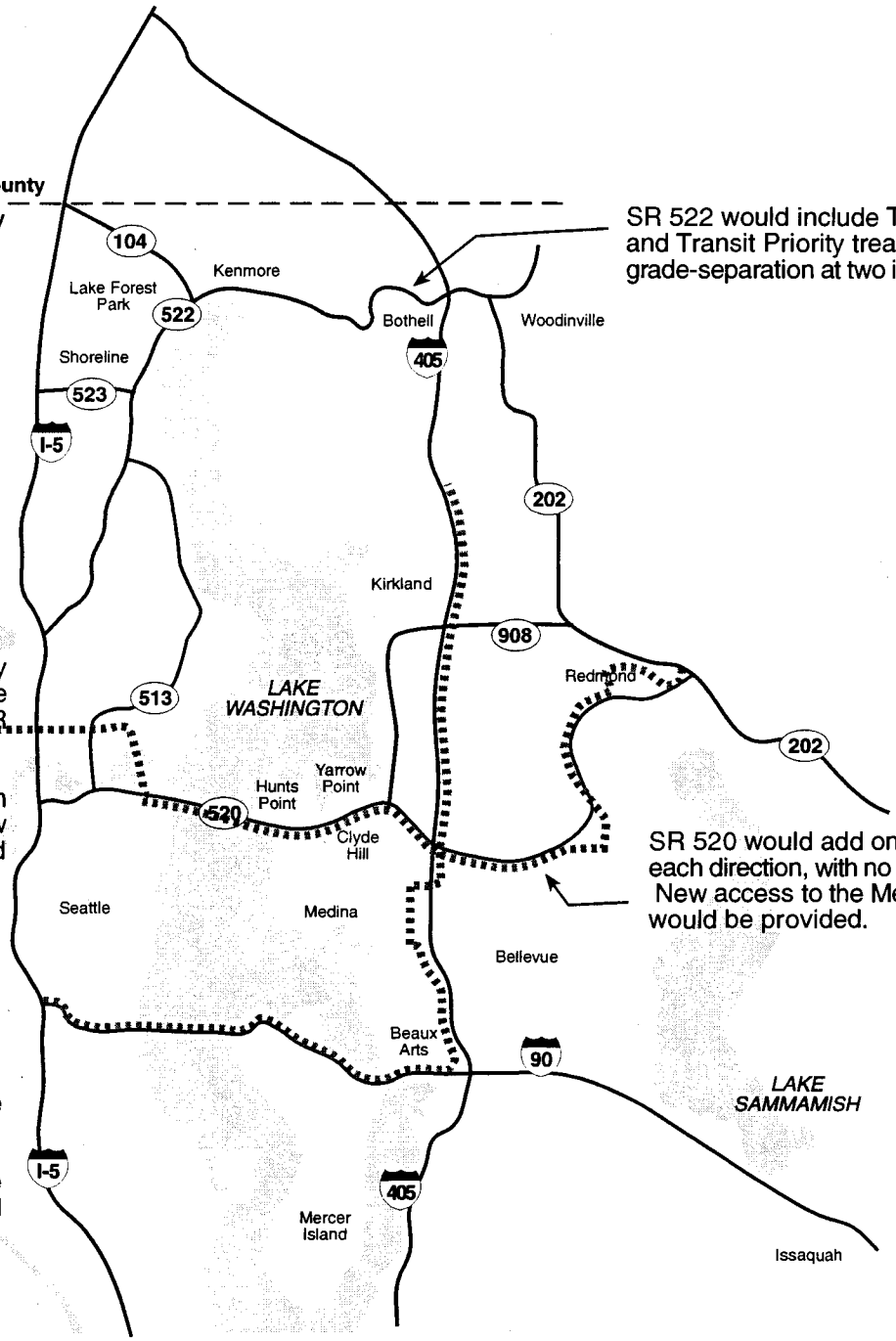
Figure 4-7
Roadway/Bus Solution Set Key Elements



SR 522 would include Transit Lane and Transit Priority treatments, with grade-separation at two intersections.

Light rail would extend from downtown Redmond to University District to Ballard. There would be a Trans-Lake crossing beside SR 520.

SR 520 would add one GP in each direction, with no new HOV. New access to the Mercer area would be provided.

SR 520 would add one GP in each direction, with no new HOV. New access to the Mercer area would be provided.

Light rail would use I-90 from downtown Seattle. Transfers to Redmond-Ballard line would be at Northup Way/NE 116th Avenue NE.

The I-90 center lanes across the lake would be replaced by rail and would not be available for other vehicles.

A north/south rail line between Northgate and SeaTac was assumed.

Where light rail service coincides with Regional Express and Local Bus Services, bus routes will feed to light rail for Trans-Lake crossings. Other routes and service levels would be the same as MTP.

TDM and land use programs are the same as MTP.

Neighborhood Enhancements, Mitigation, and Non-Motorized facilities remain to be determined.

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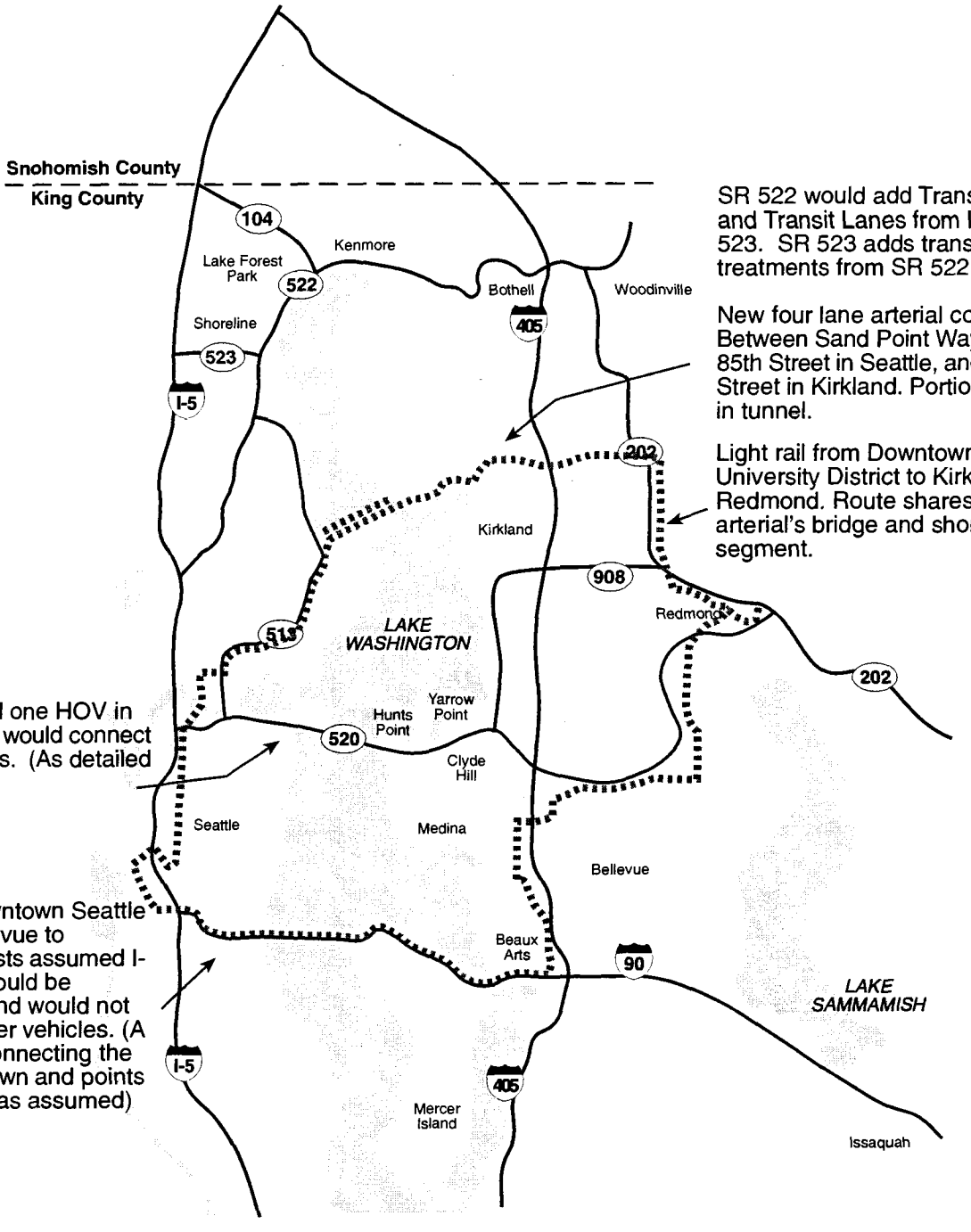
Figure 4-8
Roadway/Rail Key Elements



SR 522 would add Transit Priority and Transit Lanes from I-405 to SR 523. SR 523 adds transit priority treatments from SR 522 to I-5.

New four lane arterial connection. Between Sand Point Way NE at NE 85th Street in Seattle, and NE 124th Street in Kirkland. Portion would be in tunnel.

Light rail from Downtown Seattle to University District to Kirkland to Redmond. Route shares new arterial's bridge and short tunnel segment.

SR 520 would add one HOV in each direction and would connect to I-5 express lanes. (As detailed in MTP.)

Light rail from downtown Seattle to downtown Bellevue to Redmond. Forecasts assumed I-90 center lanes would be replaced by rail, and would not accommodate other vehicles. (A north-south line connecting the U. District, downtown and points north and south was assumed)

Where light rail service coincides with Regional Express and Local Bus Services, bus routes would feed to light rail for Trans-Lake crossings. Other routes and service levels would be the same as MTP.

TDM and land use programs would be the same as MTP '98.

Neighborhood Enhancements, Mitigation, and Non-Motorized facilities were to be determined.

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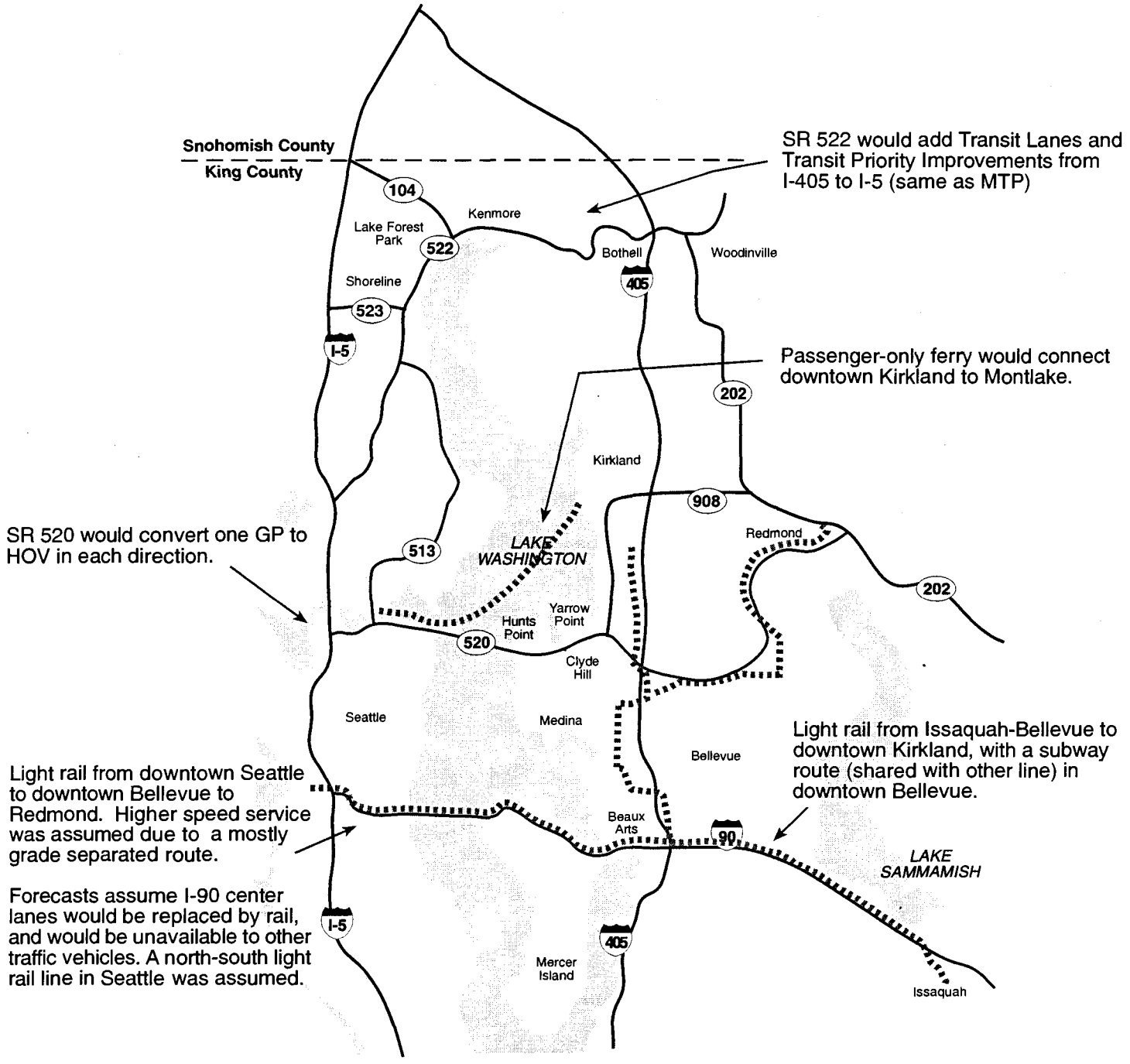
Figure 4-9
New Crossing Solution Set Key Elements



Where light rail service coincides with Regional Express and Local Bus Services, bus routes will feed to light rail for Trans-Lake crossings. Other routes and service levels would be the same as MTP '98.

Very aggressive TDM programs and land use plans would support shifts from single-occupant vehicle use. The alternative assumed the use of tolls and increased parking fees.

Neighborhood Enhancements, Mitigation, and Non-Motorized facilities were to be determined.

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Figure 4-10
Maximize Alternatives Solution Set Key Elements

4.3.1 Detailed Definitions of the Solution Sets

After the committee members had identified the solution sets to undergo further technical review and analysis, staff developed more detailed descriptions of the various actions and strategies that were included. Committee members were presented with these details, which included conceptual design approaches to the various roadway improvements, and route options and operational scenarios for the light rail improvements. Staff also further developed possible TDM and land use elements, and identified how each would be considered in the solution set evaluations. These additional details about the solution sets, which were provided to the committee members for their March 24, 1999 meeting, are included in Appendix 2. The assumptions for the area transportation network and other aspects of the solution set evaluation is shown in the Travel Forecasting Methodology report in Appendix 4.

Trans-Lake Washington Study

5. Summary of Solution Set Evaluation Methods and Findings

5. Summary of Solution Set Evaluation Methods and Findings

5.1 Introduction

For each solution set, a comprehensive evaluation provided more than 150 values and ratings, presenting the committee members with a considerable amount of information about each of the potential actions or strategies they were considering. Transportation forecasts were based on expected conditions in the year 2020, and environmental analysis was based in large part on information on existing resources, as well as on long-range comprehensive plans. To help the committee members better understand this detailed "report card" on the solution sets, staff also provided a summary overview of the key findings for each solution set. The summaries identified the major differences in the evaluation results of the solution sets, and briefly interpreted other aspects of the technical findings. The information in Chapter 5 duplicates the information in the same general form that it was given to the Committee.

5.2 How Evaluation Measures Were Developed

The screening and evaluation measures were developed through an interactive process that allowed the committee members to select criteria that reflected their interests, and ensured that the criteria used addressed the values and objectives inherent in the problem statement. The initial set of evaluation measures was based on a list of the interests and objectives the Study Committee members had provided about mobility, environmental and other issues related to Trans-Lake Transportation (meeting of July 15, 1998).

Project staff developed a "menu" of criteria for review and potential use by the committee. The "menu" also included suggestions for criteria that would cover environmental and engineering issues typically considered in planning studies. Three categories of criteria were identified for the committee's consideration: effectiveness, impacts, and costs. The categories of criteria were applied to the concepts, and both ratings and narrative summaries were provided for the committee members. The individual criteria were further developed and refined through committee member and public agency comments, and were subsequently applied to the evaluation of solution sets.

Staff provided both written summaries as well as presentations about the evaluation findings, and offered additional analysis and interpretation. In response to requests, staff also performed "sensitivity tests" to help committee members understand the range of effects that would be possible if the elements of various solution sets were reorganized.

This chapter includes summary findings of performance, impacts, and costs for each of the solution sets. More detailed performance, impacts, and cost findings are presented in Chapters 6, 7, and 8. Those chapters are organized to show the relative performance of solution sets according to each evaluation measure.

5.3 Solution Set Evaluation Methodology

The following detailed measures were applied for evaluating the performance, impacts, and costs of each of the solution sets and their individual components. They supported "summary level" measures that could be applied to overall solution sets. The measures fell into the following categories:

- Transportation Effectiveness
  - Trip Throughput
  - Mode Choice
  - Effectiveness: Congestion and System Compatibility
  - Effectiveness: Average Travel Times
  - Safety and Reliability

- Environmental Effects
  - Neighborhoods and Community
  - Natural and Sensitive Resources

- Cost

In response to committee's comments and interests dating from the beginning of the project, draft definitions of potential measures were developed and presented to the committee. At the request of committee members and other agency reviewers, the measures were revised or refined. The committee agreed upon the full set of measures to be applied in their meeting of March 24, 1999. The evaluation measures are briefly described below, focusing on the method that was used.

5.3.1 Transportation Measures

5.3.1.1 Trip Throughput

This category provided measures of the predicted travel demand for vehicles and people crossing the lake for each solution set, based on the results of the traffic forecasting exercises. The measures were developed along each Trans-Lake corridor, and combined to reach a system total.

Daily Trips – This measure showed the total number of vehicles travelling across or around the lake on an average day on each of the corridors assumed for the solution set. The travel total reflected total volumes in both directions, and was then broken down into percentages of total vehicles by mode, including general-purpose/freight, 3+ HOV (defined as vehicles with three or more occupants), and transit. Background information also showed the total vehicles by direction and by mode.

Peak Trips – This measure showed the total number of vehicles making Trans-Lake trips during an average peak period, which was assumed to be three hours. The evening peak was shown in the summary, and combined both eastbound and westbound travel, as they were expected to be about equal in most corridors by 2020. The percentages of vehicles by mode were provided (as above in Daily Trips). In background information, data for both the AM and PM peaks was made available for both eastbound and westbound directions.

Person Trips – This value showed the total number of people crossing the lake daily and at the PM peak period, and combined both directions. Background information showed the number of people travelling in each direction each day and at both AM and PM peaks.

Mode Choice: How Are People Travelling?

This category expanded on the people-carrying performance of the Trans-Lake corridors, and focused on what mode people are choosing for travel. The mode choice was shown in terms of the percentage of total **people** travelling, rather than percentages of the total **vehicles**. It started with the total number of people travelling daily and at the evening peak, and then showed the percentage of people travelling in general-purpose lanes, HOV lanes, on bus, or by rail. Additional background information provided details about eastbound and westbound travel, and for both the AM and PM peaks.

Effectiveness: How Well Does the System Work?

The measures selected for this category provided information about peak-period performance, and overall safety and reliability. The measures for system performance were congestion (based on volume-to-capacity ratios), travel time benefits, and the effect on other facilities. The peak period values in the committee summaries reflected the PM peak. Background information also provided values for the AM peak as well.

Volume/Capacity – This measure, which was shown as a ratio, compared the forecast travel volumes on each facility to its calculated capacity. The information was given for HOV and general-purpose lanes in both directions, and was calculated at a specific location at each corridor. (The capacity standard for roadway lanes was by lane, and the value did not include unique physical and operating conditions of each roadway.)

Average Change in Travel Time – This measure showed the average change in travel time between major origins and destinations in the Trans-Lake area. The travel times were compared to 1995 conditions, based on travel model calculations. The system-wide travel benefit for all corridors combined, and then divided by total trips resulted in the average savings per person. Background data provided time savings for additional origins and destinations along the corridor, and also showed travel time savings by direction.

System Compatibility – This 1 to 5 scale qualitative measure rated the effect the solution could have on other regional system features, including highways and transit. For highways, the impacts on I-5 and I-405 were considered. For transit, it reflected benefits or impacts to facilities like the future Central Link light rail system, and the presence or absence of transit-supporting infrastructure like HOV lanes or direct access. This measure applied only to major regional facilities. The following I-5 values were assigned as follows:

Highway System Compatibility

1. Severe negative affect on regional system operations; incompatible.
2. Reduced regional system operations or flexibility; reduced capacity for regional system travel.

3. Compatible with existing and future system operations. Supports continuity of general-purpose or HOV system.
4. Improved operations on regional facilities and for Trans-Lake travel, and provides a regionally planned major link for regional HOV or general-purpose system.
5. Major improvement on regional facilities and for Trans-Lake travel, and provides improved links for HOV and general-purpose systems.

Transit System Compatibility

6. Impedes or eliminates transit facilities or services.
7. Would result in less effective transit system operations or services.
8. Improves subarea of transit system, but may conflict with other regional elements.
9. Provides improved transit services on new facilities.
10. Expands or improves both subarea and regional transit system, and complements existing transit facilities and services.

Safety – This 1 to 5 scale qualitative rating considered whether the action eliminated known safety concerns along the corridor, or if it introduced new safety concerns. Examples included locations where a lane ended, or where traffic would be required to weave across lanes to enter or exit the highway.

Reliability – This qualitative measure assessed the potential for disruptions and how well the facility and system would recover from them. The measure was shown for general-purpose, HOV, bus, and rail travel. Provided as a 1 to 5 scale rating that ranged from unreliable (1) to very reliable (5), it considered factors such as the level of congestion on the facility, safety, physical features of the roadway that would allow quick recovery from incidents, and traffic management and control systems.

5.3.2 Environmental Measures

The environmental measures examined community/neighborhood and natural environment effects, first shown by corridor and then assessed for the overall solution set. When comparisons were required for a 1 to 5 qualitative rating, current conditions was used as the baseline measure.

5.3.2.1 Neighborhoods/Community

Arterial Traffic – This 1 to 5 scale qualitative rating reflected the potential for increased traffic on local arterials along the Trans-Lake corridors, or major changes to the local street network. Neighborhood areas with existing access and those with new or increased access were examined. Committee members were informed that a more detailed analysis of neighborhood traffic conditions including cut-through traffic, intersection levels of service, business access, and parking would require environmental impact statement (EIS)-level analysis.

Noise – This 1 to 5 scale qualitative measure assessed the potential for increased noise, based on modeled increases of traffic volumes along the facility, or the introduction of traffic or transit vehicle noise from a new facility. The general qualitative assessment was recommended because a more detailed analysis of noise conditions would require EIS-level study of existing conditions, and would depend on a higher level of detail about facility designs.

Displacements – This value shows the approximate range of properties that would be displaced because of the proposed action.

Supports GMA Plans – This qualitative measure assessed the proposed action's compatibility with local and regional jurisdictional plans along the corridor, including whether it served designated urban centers and other areas where growth has been targeted. It also reflected local decisions to support transit-oriented development or encourage the use of alternative modes of travel.

5.3.2.2 Natural and Sensitive Resources

Critical Areas – Based on local and regional determinations of critical or environmentally sensitive areas within the study area, this measure estimated the number of acres potentially affected. Examples of critical areas included wetlands and shoreline areas.

Parks and Refuges – This measure calculated the number of acres of parklands or wildlife refuges potentially affected by actions in the solution set. The measure was designed to be consistent with Federal regulations (Section 4[f]) affecting transportation project impacts to these resources.

ESA Issues – This 1 to 5 scale qualitative measure predicted a proposed project's potential for endangered species protection issues. The assessment focused on proposed activities in areas with a high probability for species that are or may soon be listed under the ESA.

Water Quality – This 1 to 5 qualitative measure considered the proposed project's potential to aggravate or improve known water quality problems in the corridor, after standard mitigation. A limited amount of design information was available for the alternatives, preventing a detailed analysis, but the analysis reflected the relative level of water quality mitigation measures that would be required for typical permit approvals.

Air Quality – This 1 to 5 qualitative measure was based on general estimates of increased traffic and congestion in areas that been identified as having localized air quality problems. On the system level, the analysis indicated the likelihood that the overall solution set would contribute to regional air quality violations.

5.3.3 Cost Measures

A capital cost value was provided showing the range of estimated costs required for any infrastructure required in a project; an assumption for the amount of project costs that could be required for enhancement and mitigation efforts was also developed, providing a cost range.

5.4 General Summary of Solution Set Evaluations

With the exception of the No Action solution set, nearly all of the solution sets evaluated included major new projects focused on highway or transit facilities. Their effectiveness, impacts and construction costs varied, although the largest differences between solution sets was generally found in the areas of impacts and costs. Two of the solution sets caused substantiated shifts in system travel, with Roadway/Bus substantially increasing trips and Maximize Alternatives showing a nearly equal reduction. Figure 5-1 provides a summary of construction costs, impacts, and the resulting changes in daily person and vehicle trips. Figure 5-2 shows how travel time might be affected for general-purpose and HOV users, and compares how people might shift their mode of travel under the various solution sets.

Figure 5-1. Summary of Total Costs. Impacts and Trip Volumes

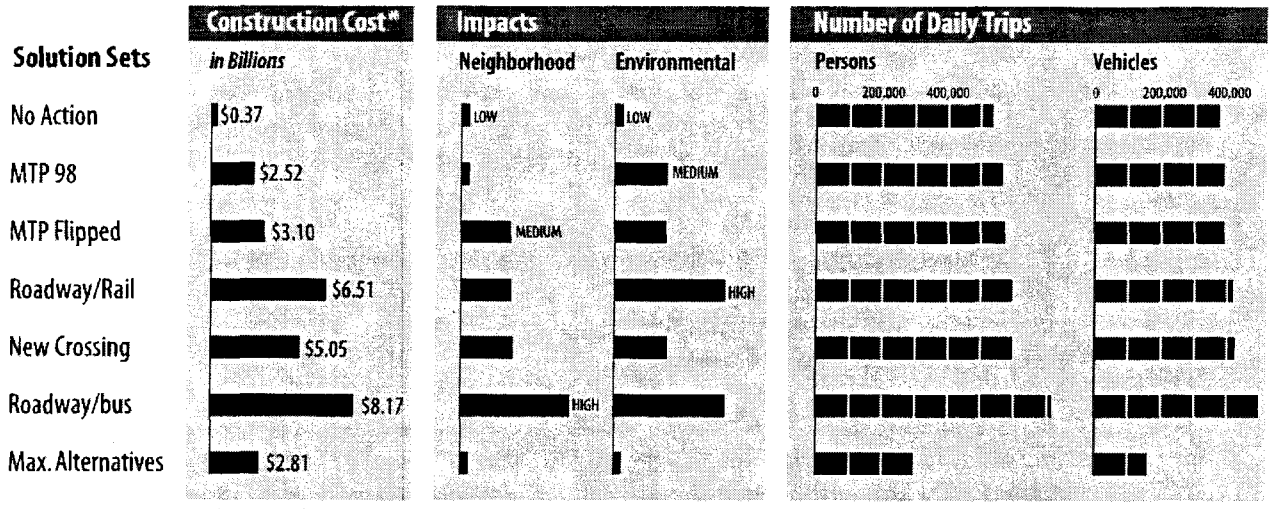
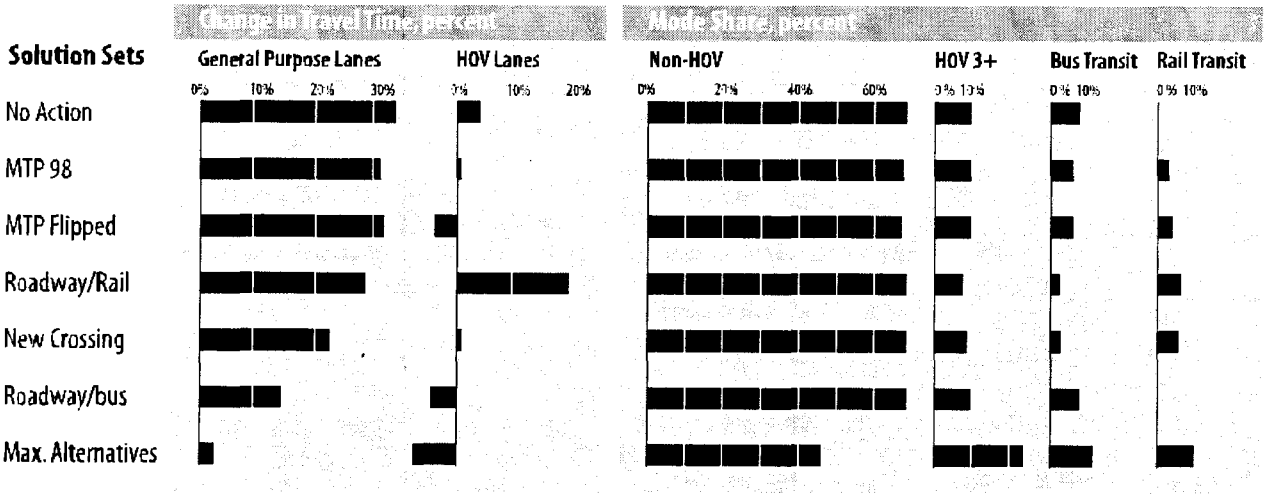


Figure 5-2. Summary of Travel Time and Model Share Results



The overall solution set results provided a system-wide view that allowed committee members to see how a combination of various actions in different corridors could affect travel and environmental conditions. At the individual corridor level, the differences between the various actions and strategies were more distinguished. However, to summarize the overall results at the system level:

- For all solution sets, person trips would grow regionally by nearly 48 percent, from 11.2 million daily trips in 1995 to 16.7 million by 2020.

- Trans-Lake person trips would grow under all scenarios except for Maximize Alternatives, but increased costs and impacts typically accompanied the increases in trips. The highest growth in person trips would occur under the Roadway/Bus solution set.

  - Maximize Alternative's very aggressive approach to TDM involved a combination of congestion pricing and TDM strategies, coupled with system level decisions that would focus a greater share of Trans-Lake travel capacity on transit and HOV modes. As modeled, this approach would actually reduce daily person trips from current conditions, from 370,000 in 1995 to 300,000 in 2020.

  - Roadway/Bus would produce the largest increases in daily person trips, in part from the addition of new corridors and the major expansion of several existing corridors. It also would involve the highest costs (over $8 billion), and the most impacts to neighborhoods and the environment.

- Mode share tended to remain similar to current levels under all sets except for Maximize Alternatives, which would reduce non-HOV travel to 45.6 percent of daily trips. The lack of variance in other solution sets was particularly striking considering the range of treatments the solution sets had for HOV, bus or light rail facilities and routes. Although these choices changed the mode shares in individual corridors, the overall percentage of travel that was general-purpose held relatively steady in the high 60th percentile (66.6 to 69 percent, compared to 78.3 percent in 1995). If commercial trips were included, the non-HOV/transit share would be 81 to 83.5 percent, compared to 83 percent in 1995.

- Travel times for general-purpose travelers was forecasted to increase by up to 20 minutes by 2020 under all scenarios, although HOV travel would typically only increase by a few minutes under most scenarios. In 1995, average Trans-Lake travel time for general-purpose travel was 25.8 minutes, but it would be 42.7 minutes in 2020 under No Action. Most of the other solution sets would have slightly better travel times in 2020 for both general-purpose and HOV travel, compared to No Action. The only exceptions were Roadway/Rail and Maximize Alternatives. Roadway/Rail would increase HOV travel times by more than 8 minutes, compared to No Action. Maximize Alternatives would increase year 2020 general-purpose travel times by up to 5 minutes, but it would reduce HOV travel times by nearly 6 minutes.

- Overall, light rail service did not attract substantially larger numbers of transit riders, compared to bus. The rail alternatives considered (as committee members noted) involved light rail technology, following the approach currently being taken by Sound Transit for the Central Link corridor between Seattle, Tukwila, and SeaTac. As evaluated, the typical light rail travel times between Seattle, Bellevue, and Redmond were calculated to be nearly 50 minutes from terminus to terminus; as a result, light rail typically did not offer substantial travel time advantages. However, Maximize Alternatives considered an entirely grade-separated route that would reduce travel times.

The following section duplicates narrative summaries of the evaluations as provided to the Study Committee. Tables 5-1a and 5-1b provide a complete listing of all values and ratings the committee members received.

5.5 Summary Evaluations by Solution Set

5.5.1 No Action Solution Set

5.5.1.1 Effectiveness

The No Action solution set assumes that the transportation system will remain as it is, except for projects that are already funded, such as the Sound Transit light rail line in Seattle, express bus service increases and addition of HOV lanes on SR 520 east of I-405.

No Action Solution Set

Includes only funded improvements, including Sound Transit first phase.

- *SR 522* – Existing four arterial lanes, transit lanes in some segments
- *Kirkland-Sand Point* – No Action
- *SR 520* – Existing four lanes, westbound HOV lane, HOV lanes east of I-405 (assumes cost of replacing existing bridge pontoons)
- *I-90* – Existing six lanes, bike path
- *TDM* – Existing programs
- Includes Sound Transit Phase I light rail transit, direct access ramps, regional bus service

Under the No Action solution set, Trans-Lake travel is expected to increase by about 168,000 daily person-trips, from about 370,000 daily person-trips in 1995 to 538,000 in the year 2020. Total vehicle trips are expected to rise by 95,000 over the same period. Because capacity is limited on SR 520, only about 20,000 additional vehicle (38,000 person-trips) trips are expected there; 27,000 additional vehicle trips (36,500 person-trips) are forecast for SR 522. About 57,000 vehicle trips (93,000 person-trips) additional person-trips are forecast for I-90 – which has more capacity for growth.

Transit and 3-person HOV use is forecast to rise significantly. Bus transit use is forecast to grow from 18,100 to 40,000 (from 4.7 to 7.4 percent share); HOV 3+ use is expected to increase from 4,900 to 50,600 (from a 1.3 to 9.4 percent share).

The average trip across the lake is expected to increase in time by 65 percent (from 25.8 to 42.7 minutes) for general-purpose trips, as compared to an 8 percent increase in time for HOV trips, (from 24.3 to 26.3 minutes).

Table 5-1a. Solution Set Evaluation Summary

	Vehicle Trips					Person Trips										Effectiveness		
						Daily					PM Peak Period							
	Daily Vehicles (000)	% GP Vehicles	% 3+ HOV Vehicles	% Commercial Vehicles	PM Peak Vehicles (000)	Total Person Trips (000)	% GP Person Trips	% 3+ HOV Person Trips	% Bus Person Trips	% Rail Person Trips	Total Person Trips (000)	% GP Person Trips	% 3+ HOV Person Trips	% Bus Person Trips	% Rail Person Trips	PM Peak Hour Volume-to-Capacity Ratio	Hwy System Compatibility	Transit System Compatibility
SR 522																		
No Action	**79.3**	85.5	1.0	13.5	**23.8**	**106.9**	94.4	2.4	3.2	NA	**34.3**	94.4	2.3	3.3	NA	**1.67**	◔	◑
MTP '98	**78.8**	85.8	0.5	13.4	**24.2**	**112.4**	89.6	1.4	9.0	NA	**36.7**	87.7	1.1	11.2	NA	**1.69**	◑	◑
MTP Flipped	**79.0**	85.8	0.6	13.5	**24.2**	**112.8**	89.5	1.4	9.1	NA	**33.9**	87.5	1.1	11.4	NA	**1.69**	◑	◑
Roadway/Rail	**77.4**	85.5	1.0	13.4	**24.4**	**111.0**	88.8	2.3	8.9	NA	**35.9**	87.2	1.7	11.1	NA	**1.69**	◑	◕
New Crossing	**67.1**	87.0	0.7	12.2	**21.7**	**96.0**	89.4	1.7	8.9	NA	**32.2**	88.0	1.1	10.7	NA	**1.52**	◑	◑
Roadway/Bus	**69.2**	81.3	7.7	11.0	**24.3**	**106.7**	77.3	15.8	6.8	NA	**40.2**	69.6	23.6	6.8	NA	**1.48**	◕	◕
Maximize Alternatives	**57.5**	85.2	1.0	6.0	**19.1**	**89.3**	82.0	1.8	16.2	NA	**31.2**	79.9	1.3	18.8	NA	**1.35**	◑	◑
Kirkland-Sand Point Roadways																		
New Crossing (Arterial)	**59.1**	82.0	1.0	17.0	**19.1**	**87.9**	84.9	1.8	0.5	12.8	**29.2**	84.7	2.1	9.4[1]		**1.29**	◑	◑
Roadway/Bus (Freeway)	**150.7**	77.0	3.0	20.0	**38.9**	**204.4**	90.3	7.1	2.6	NA	**55.0**	88.3	9.1	2.6	NA	**1.76**	○	◕
Kirkland-Seattle Ferries																		
Roadway/Bus (Bus Ferry)																		◑
Maximize Alternatives (Passenger Ferry																		◕
SR 520																		
No Action	**121.5**	71.4	3.1	25.2	**33.0**	**175.5**	83.4	6.8	9.7	NA	**51.5**	81.7	6.4	11.8	NA	**1.69**	◑	◔
MTP '98	**143.1**	66.7	9.9	23.3	**40.4**	**226.4**	70.9	19.8	9.3	NA	**71.7**	63.2	26.7	10.1	NA	**1.76**	◕	◑
MTP Flipped	**140.1**	68.5	7.6	23.9	**38.7**	**218.0**	73.9	15.5	1.2	9.4	**64.4**	68.4	20.2	11.2[1]		**1.76**	◕	◑
Roadway/Rail	**172.0**	71.9	4.7	23.5	**49.9**	**250.9**	81.6	10.0	0.8	7.5	**75.5**	79.1	11.6	9.3[1]		**1.66**	◑	◔
New Crossing	**130.7**	66.4	10.5	23.1	**38.0**	**195.2**	74.7	22.1	3.2	NA	**62.2**	66.2	30.1	3.5	NA	**1.64**	◕	◑
Roadway/Bus	**123.4**	72.5	5.1	22.3	**39.8**	**187.5**	78.2	10.6	11.1	NA	**62.8**	77.2	11.0	11.8	NA	**1.28**	●	◕
Maximize Alternatives	**51.9**	37.6	41.4	21.0	**17.1**	**123.6**	29.9	54.9	15.3	NA	**43.7**	25.1	61.2	13.7[1]		**0.89**	◔	◕
Rail																		
MTP '98	Seattle-Bellevue-Overlake via I-90																	
MTP Flipped	Seattle-Bellevue-Overlake via SR 520																	○
Roadway/Rail	Redmond-U.W.-Ballard via SR 520																	◕
	Seattle-Bellevue-Totem Lake via I-90																	◑
New Crossing	Redmond-U.W.-Seattle via K-SP Bridge					Measurements for light rail are included in the tabulation of vehicle trips and person trips for the respective corridors												◕
	Seattle-Bellevue-Redmond via I-90																	◕
Maximize Alternatives	Issaquah-Bellevue-Kirkland via I-90 and I-405																	●
	Seattle-Bellevue-Redmond via I-90																	◕
I-90																		
No Action	**171.0**	71.5	6.7	21.9	**48.0**	**225.5**	78.2	14.1	7.6	NA	**79.2**	74.2	17.7	8.1	NA	**1.64**	◑	◔
MTP '98	**164.5**	75.6	1.2	23.2	**45.2**	**227.6**	89.5	2.8	0.3	7.5	**66.0**	89.7	2.1	8.2[1]		**1.67**	◔	◔
MTP Flipped	**170.4**	73.4	4.0	22.7	**47.0**	**246.0**	83.3	8.7	8.0	NA	**75.6**	78.8	12.4	8.7	NA	**1.67**	◕	◔
Roadway/Rail	**161.1**	73.7	3.7	22.6	**45.1**	**233.5**	83.2	8.1	1.2	7.5	**68.9**	81.1	9.7	9.1[1]		**1.67**	◔	◔
New Crossing	**157.3**	75.5	1.5	23.1	**43.7**	**223.1**	83.1	8.9	2.5	5.4	**64.3**	87.2	2.3	10.5[1]		**1.62**	◔	◔
Roadway/Bus	**143.4**	72.9	4.5	22.5	**41.7**	**213.2**	80.5	9.6	9.9	NA	**66.2**	75.8	13.9	10.3	NA	**1.44**	◔	◑
Maximize Alternatives	**45.1**	75.6	0.3	23.7	**13.8**	**86.8**	64.6	1.2	NA	34.2	**27.8**	64.3	2.2	17.3[1]		**0.51**	◔	◔
Solution Set Summary																		
No Action	**371.8**	74.5	4.3	21.2	**104.8**	**537.9**	83.2	9.4	7.4	NA	**165.0**	80.7	11.0	8.3	NA	**1.66**	◑	◔
MTP '98	**386.4**	74.4	4.3	21.3	**109.8**	**566.4**	82.0	9.3	5.6	3.0	**174.3**	78.4	12.0	9.6[1]		**1.70**	◑	◑
MTP Flipped	**389.5**	74.1	4.6	21.3	**109.9**	**576.8**	81.0	9.9	5.7	3.5	**178.7**	76.8	13.0	10.2[1]		**1.70**	◕	◔
Roadway/Rail	**410.5**	75.2	3.6	21.2	**118.1**	**595.4**	83.5	7.8	2.5	6.1	**180.4**	81.5	8.9	9.6[1]		**1.67**	◑	◑
New Crossing	**414.2**	75.4	4.1	20.5	**122.5**	**602.2**	83.1	8.9	2.5	5.5	**187.8**	80.0	11.3	8.7[1]		**1.54**	◑	◑
Roadway/Bus	**486.7**	75.3	4.7	20.0	**144.7**	**712.0**	82.2	10.1	7.7	NA	**224.0**	78.2	13.7	8.2	NA	**1.47**	◔	◕
Maximize Alternatives	**154.5**	66.4	14.4	19.2	**50.0**	**299.7**	55.5	23.5	11.1	9.9	**102.6**	52.4	27.0	20.6[1]		**0.82**	◔	◕

1) % Person Trips on Rail and Bus combined.

Table 5-1b. Solution Set Evaluation Summary

		Safety and Reliability					Environmental Effects									
							Built Environment					Natural Environment				
		Safety	GP Reliability	3+ HOV reliability	Bus Reliability	Rail Reliability	Arterial Traffic	Noise	Displacements	Supports GMA Plans	Physical Barriers	Critical Areas	Parks and Refuges	ESA Issues	Air Quality	Water Quality
SR 522																
No Action		◔	○	○	◔	NA	◑	◑	◕	◑	◕	◕	◕	◕	◑	◑
MTP '98		◑	○	○	◑	NA	◔	◑	◑	◕	◕	◑	◕	◑	◑	◑
MTP Flipped		◑	○	○	◑	NA	◔	◑	◑	◕	◕	◑	◕	◑	◑	◑
Roadway/Rail		◑	○	◑	◑	NA	◔	◔	○	◑	◕	◔	◔	◑	◑	◑
New Crossing		◑	○	○	◑	NA	◑	◑	◑	◕	◕	◑	◕	◑	◑	◑
Roadway/Bus		◔	○	◕	◕	NA	◑	◑	○	◔	◔	◔	◔	◔	◔	○
Maximize Alternatives		◑	◑	◑	◑	NA	◔	◑	◑	◕	◕	◑	◕	◑	◑	◑
Kirkland-San Point Roadways																
New Crossing (Arterial)		◑	◔	◔	◔	NA	○	◔	◔	◑	◔	◔	◑	◔	◔	◔
Roadway/Bus (Freeway)		◕	○	◕	◕	NA	◔	◔	○	○	◔	◔	◔	◔	◔	○
Kirkland-Seattle Ferries																
Roadway/Bus (Bus Ferry)					◑		◔	◑	◑	◕	◕	◑	◔	◔	◕	○
Maximize Alternatives (Passenger Ferry)							◑	◑	◑	◕	◕	◑	◔	◑	◕	◔
SR 520																
No Action		◑	○	◔	◔	NA	◑	◑	◕	◑	◕	◕	◕	◕	◑	◔
MTP '98		◕	◔	◑	◑	NA	◔	◔	◑	●	◕	○	○	◔	◑	◑
MTP Flipped		◕	◔	◑	◑	NA	◔	◔	◔	◑	◕	○	○	○	◑	◑
Roadway/Rail		◕	◔	◔	◔	NA	○	○	◔	◑	◕	○	○	○	◑	◑
New Crossing		◕	◔	◑	◑	NA	◑	◔	◔	●	◕	○	○	◔	◑	◑
Roadway/Bus		◕	◑	◕	◕	NA	◑	○	◔	◑	◕	○	○	○	◔	◑
Maximize Alternatives		◑	◕	●	●	NA	◑	◑	◕	◑	◕	◕	◕	◕	◑	◔
Rail																
MTP '98	Seattle-Bellevue-Overlake via I-90	◑				◕	◑	◑	◕	●	◑	◑	◑	◑	◑	◑
MTP Flipped	Seattle-Bellevue-Overlake via SR 520	◑				◕	◑	◑	◑	●	◕	◔	◔	◔	◕	◑
Roadway/Rail	Redmond-U.W.-Ballard via SR 520	●				◕	◑	◑	◔	●	◑	○	◔	◔	◕	◑
	Seattle-Bellevue-Totem Lake via I-90	◕				◕	◑	◑	◑	◑	◔	◑	◔	◑	◕	◑
New Crossing	Redmond-U.W.-Seattle via K-SP Bridge	◔				◕	○	◑	◔	◑	◑	◔	◑	◑	◕	◑
	Seattle-Bellevue-Redmond via I-90	◕				◕	◑	◑	◑	◕	◑	◔	◑	◑	◑	◑
Maximize Alternatives	Issaquah-Bellevue-Kirkland via I-90	◕				●	◑	◑	◕	◕	◑	◑	◑	◑	◕	◑
	Seattle-Bellevue-Redmond via I-90	◕				●	◑	◑	◑	◕	◑	◔	◑	◔	◕	◑
I-90																
No Action		◕	○	◑	◑	NA	◑	◑	◕	◑	◕	◕	◕	◕	◑	◑
MTP '98		◑	◔	○	○	NA	◑	◑	◕	◕	◕	◕	◕	◕	◕	◕
MTP Flipped		◑	◔	◕	◕	NA	◑	◕	◕	◕	◕	◕	◕	◕	◑	◕
Roadway/Rail		◕	◔	◔	◔	NA	◑	◑	◕	◕	◕	◕	◕	◕	◑	◑
New Crossing		◕	◔	◔	◔	NA	◔	◕	◕	◕	◕	◕	◕	◕	◑	◕
Roadway/Bus		◕	◑	◕	◕	NA	◕	◕	◕	◕	◕	◕	◕	◕	◑	◕
Maximize Alternatives		◑	◕	◕	◕	NA	◑	◑	◕	◕	◕	◕	◕	◕	◑	◕
Solution Set Summary																
No Action		◑	○	◔	◑	NA	◑	◑	◕	◑	◕	◕	◕	◕	◑	◑
MTP '98		◑	◔	◔	◔	◕	◑	◑	◑	●	◕	◔	◑	◑	◑	◑
MTP Flipped		◑	◔	◑	◑	◕	◑	◑	◑	◕	◕	◔	◔	○	◑	◑
Roadway/Rail		◕	◔	◔	◔	◕	◑	◑	◔	◑	◑	○	◔	◔	◑	◑
New Crossing		◑	◔	◔	◔	◕	◑	◑	◔	◕	◑	◔	◑	◑	◑	◑
Roadway/Bus		◕	◔	◕	◕	NA	◕	◑	◔	◑	◑	◔	◔	◔	◑	◑
Maximize Alternatives		◑	◑	◕	◕	●	◑	◑	◑	◕	◕	◑	◑	◑	◑	◑

5.5.1.2 Impacts

Impacts resulting from No Action include increased neighborhood traffic impacts (noise, cut-through traffic). On SR 522, increased traffic would make it more difficult for local traffic to access or to cross the roadway. On SR 520, noise and neighborhood traffic impacts would worsen on both sides of the bridge. On I-90, existing traffic would have a small impact on neighborhoods and the environment due to existing mitigation measures.

5.5.1.3 Costs

The capital cost of the No Build alternative, which includes only the cost of replacing the SR 520 bridge pontoons, is calculated to be $450 million and $414 million with contingencies. Other funded costs are not included.

5.5.2 MTP '98 Solution Set

5.5.2.1 Effectiveness

The most significant findings under this Trans-Lake solution set are related to the addition of HOV lanes on SR 520, and the introduction of light rail to the east side across I-90. Relative to No Action, overall person trips across I-90 would *decrease* by about 11 percent, as the rail line would carry only ½ the people that the HOV lanes would carry by 2020. In the SR 520 corridor, person trips would increase nearly 30 percent over No Action, while the vehicular increase would be only 18 percent. The added HOV lanes on SR 520 would carry dramatically more people than transit on I-90 under MTP '98.

MTP '98 Solution Set

- *SR 522*– Continuous transit lane and priority treatments
- *Kirkland-Sand Point* – No Action
- *SR 520* – Added HOV lanes (continuous for entire route), two Standard general-purpose lanes with shoulders
- *I-90* – Seattle/Bellevue/Overlake light rail replaces center lanes
- *TDM* – Aggressive implementation of demand management strategies
- *Non-Motorized* – Added bicycle/ pedestrian improvements on SR 520 and SR 522

Travel times across the lake would increase an average of 62 percent over today (about 2 percent less than No Action) for general-purpose and commercial traffic across Lake Washington (from 25.8 to 41.9 minutes), while the HOV travel times would increase only 0.9 percent (from 24.3 to 24.5 minutes system-wide) and would actually decrease across SR 520.

In response to committee requests, project staff provided a "sensitivity test" assessment of the potential effect of a solution set that added a transit-only lane across the lake instead of an HOV lane. (The results of sensitivity tests are shown in Table 6-5.)

At the corridor and at the system level, an added transit-only lane would offer fewer benefits than an HOV lane, but it would still improve conditions over no action. Compared to the MTP '98 added HOV lane, a transit-only lane, transit use would increase less than 10 percent on SR 520 from 21,100 to 23,700. At the same time, both HOV and non-HOV volumes would drop, with HOV riders decreasing the most due to the loss of travel time advantages. The I-90 corridor would experience increased HOV use as carpools and vanpools divert to a slightly less congested I-90. In addition, the change to transit-only on SR 520 would mean that there would be no HOV facilities on the two major bridge crossings, and no overall advantages for HOV travel compared to

general-purpose. The result would be the lowest HOV use found in all scenarios, total Trans-Lake travel; 37,400 total HOV trips would occur, compared to 50,600 for no action, and 52,700 for MTP '98.

5.5.2.2 Impacts

The impact of the added HOV lanes on SR 520 would be significant on both sides of the lake. Without mitigation, noise and neighborhood traffic impacts would increase. It is anticipated that further study could result in mitigating many of the impacts. In the I-90 corridor, impacts would modestly decrease in this solution set (less car traffic), but the addition of light rail to surface streets on the east side would have a significant impact on arterial operations. This could be addressed by "grade separating", though at high cost.

5.5.2.3 Costs

The committee was initially presented the costs for the improvements, without allowances for mitigation costs. Total costs with a contingency allowance were $2.53 billion. The costs by corridor were:

- SR 522 – $97 million for transit lane improvements
- SR 520 – $1.3 billion for continuous HOV lanes
- I-90 – $662 million for conversion of the center roadway for rail and new rail corridor through Bellevue to Overlake

5.5.3 MTP "Flipped" Solution Set

5.5.3.1 Effectiveness

By adding light rail to SR 520 instead of I-90, total person trips accommodated across and around the lake would increase above MTP '98 slightly (about two percent). At the corridor level, SR 520 would carry slightly fewer people (by 2020) than MTP '98 as the HOV lanes on I-90 re-capture trips moved out of the center lanes in MTP '98. The overall mode split across the lake would not change noticeably by placing rail on SR 520 instead of I-90 in this scenario, while overall vehicular traffic remains fairly stable in the two corridors.

HOV travel times across the lake would be expected to be about 8 percent faster than today (22.3 minutes vs. 24.3 minutes today), with general-purpose traffic experiencing about 67 percent increase in travel time from 25.8 to 42.1 minutes).

MTP "Flipped" Solution Set

- *SR 522* – Same as MTP '98 (continuous transit lanes)
- *Kirkland-Sand Point* – Same as MTP '98 (No Action)
- *SR 520* – Roadway same as MTP '98 (general-purpose and HOV) with added light rail (Seattle, University of Washington, Bellevue, Overlake)
- *I-90* – 2-way HOV operation on center lanes (no light rail)
- *TDM* – Same as MTP '98
- *Non-Motorized* – Same as MTP '98

5.5.3.2 Impacts

Impacts in the SR 520 corridor would increase beyond those of MTP '98 in this scenario, as the roadway configuration is the same, but light rail increases the width of the corridor, particularly on the eastside. On the west side, the rail connection to the University area would be difficult to construct and mitigate. Potential impacts to the natural environment across Union Bay present challenges that require extensive discussion with regulatory agencies. Partial rerouting may provide some mitigation.

Additionally, light rail trains from across the lake into the downtown tunnel from the *north* create problems for transit operations, as the overall tunnel capacity for trains is nearly entirely used accommodating demand from the main line coming in from the University District. The north line ridership is nearly equivalent to the sum of south and east line ridership. Bringing eastside rail riders into the downtown rail tunnel from the north could cause the rail tunnel to quickly exceed its capacity and limit the extent of possible rail expansion to the north. Ridership forecasts provided by Sound Transit indicate that rail routed across I-90 would provide greater capacity, as ridership flows would be more balanced.

5.5.3.3 Costs

The total costs for the solution set with contingency was estimated at $43 billion, without mitigation. The costs per corridor were:

- SR 522 – Same as MTP '98 ($97 million) for continuous transit lanes
- SR 520 – Road ($1.3 billion), Rail ($1.2 billion) for continuous HOV and rail, for a total of 2.4 billion
- I-90 – $16 million for two-way operation of the center roadway

5.5.4 New Crossing Solution Set

5.5.4.1 Effectiveness

The most significant element of this solution set is the introduction of a new crossing location for vehicular and light rail vehicles. This new capacity would result in a reduction in vehicular (and person trip) volumes in the SR 522 corridor, but not in the SR 520 corridor (as compared to No Action). It would result in a reduction in both corridors relative to MTP '98. This new crossing would accommodate about 12 percent increase over no action in total trips across the lake to a total of 602,200 trips, with nearly 88,000 people (59,000 vehicles) crossing the new bridge. The rail line at this location would carry about 11,000 people daily. General traffic travel times across the lake would be about 20 percent quicker than experienced under No Action (although still 45 percent longer than today). HOV travel times would be about the same as today (about 8 percent better than No Action).

New Crossing Solution Set

- *SR 522* – Same as MTP '98 (continuous transit lanes)
- *Kirkland-Sand Point* – Four-lane arterial connection across the lake from Sand Point Way to NE 124th in Kirkland
- Light rail from Seattle/University of Washington to Redmond
- *SR 520* – Same as MTP '98 (continuous HOV lanes)
- *I-90* – Light rail from Seattle to Bellevue/Redmond (grade separated)

5.5.4.2 Impacts

Introducing a new crossing of Lake Washington has inherent, unmitigable impacts associated with it. Perhaps the most dramatic impact would be evident on the arterial system and neighborhoods in both Kirkland and Seattle (NE 124th, 100th Avenue, and along 85th and Sand Point Way). Traffic congestion on these arterials would be severe, along with difficult issues associated with introducing a significant noise source and cut-through traffic into adjacent neighborhoods.

The impacts of light rail in the I-90 corridor are described in previous solution set summaries. Light rail along the 124th corridor in Kirkland would exacerbate the arterial congestion discussed above, unless it was totally grade separated (again at significant additional cost). Light rail along Sand Point Way to the University would cause increased arterial congestion, as well as the introduction of noise to lake-front neighborhoods.

5.5.4.3 Costs

The total costs for the solution set with contingency amounts included was estimated at $5.02 billion. The costs did not include mitigation measure of improvements to intersection arterials that would be required to accommodate the anticipated demand. The breakdown by corridor was:

- SR 522 – $55 million
- Kirkland/Sand Point – $1.1 billion for the arterial portion and $934 million for rail portion, for a total new corridor cost of $1.9 billion
- SR 520 – $1.3 billion
- I-90 – $979 million

5.5.5 Roadway/Rail Solution Set

5.5.5.1 Effectiveness

This solution set would add some general-purpose capacity, and a significant amount of transit capacity across the lake (two rail lines). Overall, person trips across the lake would increase by nearly 60,000 over No Action to a total of 595,400 trips, and about 30,000 over MTP '98. The majority of this increase would be the result of additional general-purpose (one- and two-person occupant vehicles) travel. The rail lines in each corridor would carry about 18,000 people, or about six percent of overall cross-lake travel with a total HOV/transit mode share of 16.4 percent.

Travel times across the lake (compared to No Action) would increase significantly for HOV traffic (about 25 percent), making the rail travel time relatively more appealing. Travel time would decrease about 5 percent for general-purpose traffic across the lake.

Roadway/Rail Solution Set

- *SR 522* – Same as MTP '98 (continuous transit lanes) with added grade separations
- *Kirkland-Sand Point* – No Action
- *SR 520* – Add one general-purpose lane each direction
- Add light rail from Redmond to University of Washington to Ballard (transfer to N-S line)
- *I-90* – Rail from Seattle/Bellevue/ Totem Lake (replaces center lanes)
- *TDM* – Same as MTP '98
- *Non Motorized* – Same as MTP '98

5.5.5.2 Impacts

The physical impacts of adding general-purpose lanes in the SR 520 corridor would be very similar to those under MTP where HOV lanes would be added. The addition of nearly 30,000 vehicle trips, however, would result in worsening neighborhood traffic and noise beyond what would be experienced under MTP (again, before considering mitigation). Additionally, the new connections to the Mercer/Fairview area and to Pacific Avenue near Husky Stadium would present significant changes to each location. On the positive side, the Fairview connection could reduce the Mercer weave problem on I-5, and lessen traffic using the Roanoke interchange that uses that location to access downtown to avoid I-5. The expected addition of approximately 3,700 vehicles (PM peak period) to Fairview Avenue (in the Eastlake area) clearly raises cause for concern however.

Similarly, providing a new connection from SR 520 to Pacific Avenue would result in a lessening of traffic at the Montlake Interchange (and across the cut), but much of those traffic impacts would be transferred to the Pacific/Montlake intersection area.

Both of these connections require more detailed study to better understand impacts and opportunities for mitigation.

The addition of light rail in the SR 520 corridor in this solution set is very similar to the physical impacts under MTP "Flipped". The train operational issues are lessened somewhat, as trains from the east are no longer entering the tunnel. The eastside transfers required at 45th, however, would tend to fill up the trains, limiting the ability for passengers from Capitol Hill and First Hill to get onto the trains. Rail impacts in the I-90 corridor would be similar to those under MTP '98; however, the arterial traffic impacts would occur along different roadways on the eastside.

5.5.5.3 Costs

The total costs for the roadway/rail solution set with contingency amounts, but not mitigation, included was $6.3 billion. These costs by corridor were:

- SR 522 – $174 million
- SR 520 – Highway – $2.4 billion for on additional general-purpose lane, and for the new arterial connections, plus $1.8 billion for rail, for a total of $4.2 billion in the corridor
- I-90 – $979 million for a route, including rail conversion of the center roadway

5.5.6 Roadway/Bus Solution Set

5.5.6.1 Effectiveness

This solution set would substantially increase highway capacity across the lake, including four new general-purpose lanes, six new HOV lanes, conversion of SR 522 transit lanes to HOV use, and preservation of highway capacity in the I-90 center roadway. As a result, 175,000 more person-trips are forecast daily across the lake; roughly a 1/3 increase in both person-trips and vehicle-trips across the lake compared to No Action. This illustrates that many people currently organize their lives to avoid cross-lake congestion. As capacity limitations across the lake are diminished, more people would choose home, work and recreation options that rely on crossing the lake.

Roadway/Bus Solution Set

- *SR 522* – Same as MTP '98with HOV lanes instead of transit-only lanes
- *Kirkland-Sand Point* – Add new six-lane highway between I-5 and I-405, including two general lanes and one HOV lane per direction
- Add bus/passenger *ferry*
- *SR 520* – Add one general-purpose lane each direction, and add one HOV lane each direction
- *I-90* – Two-way HOV operation on center lanes (no light rail)
- *TDM* – Same as MTP '98
- *Non Motorized* – Same as MTP '98

Transit and HOV use are also forecast to increase substantially over No Action (40 and 42 percent, respectively), although transit mode share would be less than for other alternatives. Total transit and HOV patronage is higher, however, because they are carrying roughly the same portion of a far bigger total number of trips than for other solution sets.

The addition of full HOV lanes in the SR 522 corridor results in a 4-fold increase (compared to No Action) in HOV travel in the corridor (to nearly 17,000 person trips). This solution set results in relatively high speeds of HOV and bus traffic traveling along this arterial roadway, which raises significant congestion and safety issues related to cross-street and pedestrian traffic.

The SR 520 corridor includes significant increases in capacity under this option, but it is not fully utilized as a result of the new crossing approximately one-mile north. The expected vehicle trips are about the same as under No Action; however the increased capacity would result in significantly less congestion along the corridor.

The six-lane new freeway in this solution set has a dramatic effect on the overall person and vehicle throughput across the lake. This however is tempered by the connections at I-5 and I-405, where both freeways are currently congested during peak periods, and anticipated to grow much worse in the future. In effect, traffic would move quickly across the lake, only to reach backups on I-5 and I-405.

The effectiveness of the bus-passenger ferry is anticipated to have little impact in addressing cross-lake mobility (<500 people/day), primarily due to relatively poor travel time compared to busing in the roadway corridors.

5.5.6.2 Impacts

As identified above, the impact of the new six-lane crossing has serious implications on I-5 and I-405. The impacts on Sand Point Way (where the only other access to the facility is provided) are severe as well. The physical impact of the corridor is significantly reduced by tunneling, however introducing noise and traffic at the portal locations to areas near the lake which are currently relatively quiet would be difficult to mitigate.

Along the SR 522 corridor, HOV lanes create severe impacts along the arterial from the standpoint of displacements (about 230 commercial, residential, and multi-family buildings), congestion, safety (related to cross-street traffic), and noise.

In the SR 520 corridor, the number of lanes is increased from 4 to 8, resulting in about 60 to 70 displacements. This may be significantly lowered if a design option for "stacking" the roadway is considered in more detail. Traffic impacts to the neighborhoods are decreased from those expected under No Action, as the mainline corridor is much less congested.

5.5.6.3 Costs

The total costs for the Roadway/Bus solution set with a contingency amount included was $8.6 billion, not including mitigation. While this costs is significantly higher than other solution sets under consideration, a substantial amount of the costs is for the Kirkland/Sand Point corridor, where the new freeway with a tunnel is proposed. The tunnel would be a mitigation or impact avoidance measure. The costs of the route with the tunnel is not entirely comparable to the costs in other corridors, where costs do not include mitigation. The costs in this solution set do not include the costs associated with improving I-5 and I-405 to allow each facility to receive the projected demand without severe congestion. The costs by corridor were:

- SR 522 – $150 million
- Kirkland-Sand Point – Roads: $4.8 billion; Ferry: $52 million
- SR 520 – $2.16 billion
- I-90 – $16 million

5.5.7 Maximize Alternatives Solution Set

5.5.7.1 Effectiveness

This solution set includes a very aggressive approach to reducing demand for SOV use, and providing extensive infrastructure support to accommodate a shift to ridesharing/transit. The most notable elements of this set include the conversion of one general-purpose lane in each direction on SR 520 to HOV only, and implementation of congestion pricing across all Trans-Lake corridors. (Assumed $5.00 round-trip peak period toll plus $.50/hour parking increase).

Maximize Alternatives Solution Set

- *SR 522* – Continuous transit lane and priority treatments
- *Kirkland-Sand Point* – Passenger-only ferry between Kirkland and UW/Montlake area
- *SR 520* – Convert one general-purpose lane (each direction) to HOV – no other modifications
- *I-90* – Seattle/Bellevue/Redmond light rail replaces center lanes
- *I-90* – Light rail line from Issaquah/ Bellevue/Kirkland
- *TDM* – Very aggressive implementation of TDM strategies, including congestion pricing and increases parking pricing
- *Non-Motorized* – Addressed bicycle/pedestrian improvements on SR 522, and increased emphasis on community and neighborhood connections

These strategies significantly reduce overall person and vehicle trips to 300,000 and 155,000, respectively, as compared to No Action (537,900 p; 371,800 v). As an additional point of comparison, this solution set results in 19 percent less Trans-Lake vehicle trips than today. Many trips would be shifted to the arterials and highways on each side of the lake, as people would still be making work and other trips, but avoiding Trans-Lake travel.

The effects of congestion in this solution set are minimized as a result of significantly lower traffic volumes across the lake due to pricing. The particular effect on SR 520 is centered around the lane conversion. During the PM peak period, the single general-purpose lane would have queues extending from the east high-rise to beyond 148th near Overlake. During the AM period, queues would extend from the west high-rise back to I-5. It is anticipated that these backups will spill over onto I-5 and onto I-405.

This solution set results in the highest rail ridership for a single line of any of the rail alignments tested (about 30,000/day on the I-90 alignment), and relatively high HOV use compared to most other solution sets (about 20,000 more people than under No Action).

Additional "sensitivity test" analysis was conducted on this solution set to determine the incremental effects of lane conversion, and pricing separately.

Lane Conversion on SR 520 – As compared to No Action, converting a lane in each direction from general-purpose to HOV would result in an overall drop of vehicle throughput from 121,500 to 82,300 (about 43 percent). Person throughput would also drop significantly (175,000 to 141,600) despite an increase of 22,500 in HOV and bus use. The higher traffic volumes (resulting from removing pricing from this scenario) would have the effect of 69,000 daily vehicles using the remaining general-purpose lanes. This means that the general-purpose lanes would be at theoretical capacity from 5:00 a.m. to 10:00 p.m. in both directions, every day. On and off movements at every interchange, and weaving to/from the HOV lane, would worsen this situation, creating extensive backups the entire length of SR 520, and on I-5 and I-405 approaching SR 520.

Pricing – As part of a "sensitivity test" performed at committee request, the effects of congestion pricing were tested without the lane conversion with the following results (the equivalent of a $5.00 round trip toll assumed and $0.50/day increase in parking fees):

- Overall vehicular volumes on the cross-lake corridors drop from 372,000 under No Action, to 140,000 (approximately 62 percent).

- Overall person trips across the lake drop from 538,000 (No Action) to 239,000 (56 percent decrease).

5.5.7.2 Impacts

The impacts resulting from a drop in cross-lake travel under this solution set could have both positive and negative effects. From a regional mobility perspective, congestion on the overall transportation system would increase as a result of the reduction in general-purpose capacity across the lake, and the re-distribution of trips throughout the region. However, the vehicle miles traveled and vehicle hours traveled would remain at the same levels found with the other "Build" solution sets. This could tend to move activity centers on each side of the lake toward more independence and higher densities. It could also place increased pressure on established growth management boundaries, as more people seek to escape the congestion.

At the neighborhood level, the reduction in vehicular volumes through the cross-lake corridors will tend to reduce the impacts of neighborhood cut-through traffic and its associated impacts. However, the congestion in the remaining general-purpose lanes on SR 520 will result in difficulty accessing the system, and a corresponding "back-up" along the approaching arterials through the neighborhoods. To understand these impacts in greater detail would require a significant amount of more detailed study.

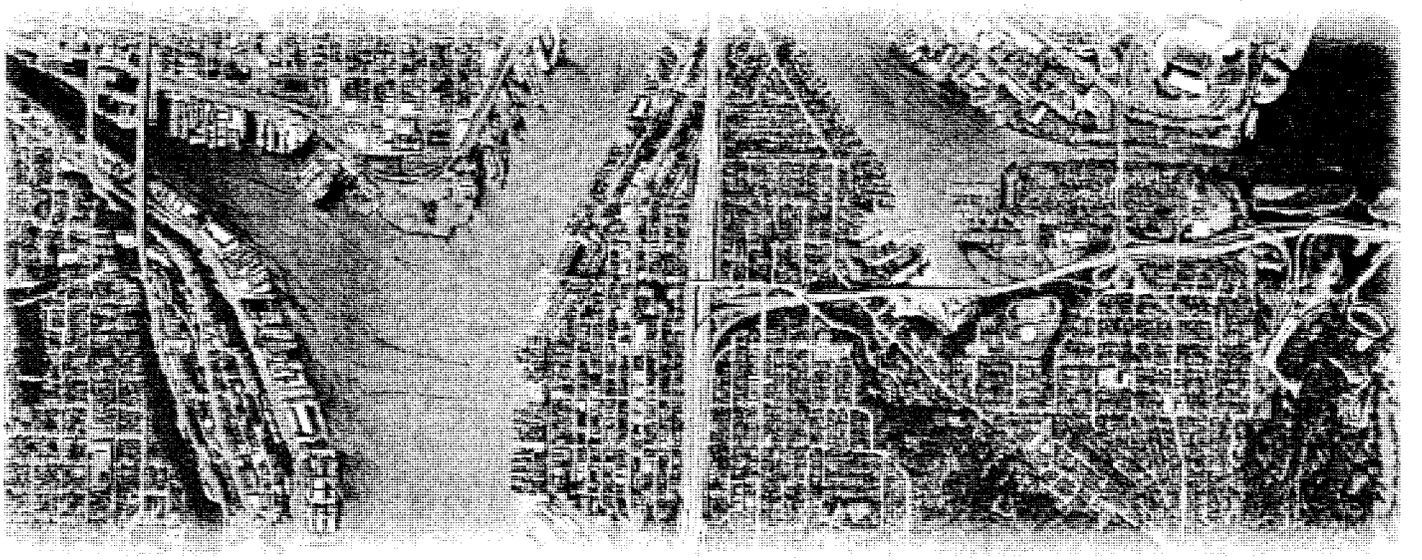
5.5.7.3 Costs

Total costs for the Maximize Alternative solution set with a contingency amount applied was $2.94 billion. The total did not include additional costs or potential revenues related to congestion pricing or other actions considered as part of the TDM strategy. The costs by corridor were:

- SR 522 – $97 million for transit lane improvements (per MTP '98)
- Kirkland-Sand Point – Passenger-only ferry ($29 million)
- SR 520 – Floating bridge replacement plus miscellaneous operational improvements ($345 million)
- I-90 – Rail-Seattle/Bellevue/Redmond ($1.2 billion)
- I-90 – Rail-Issaquah/Bellevue/Kirkland ($710 million)

Trans-Lake Washington Study

6. Transportation Methods and Findings



6. Transportation Findings

In the Study Committee members' evaluation materials, 17 measures of transportation effects were provided at corridor and system levels. Overall, 16 different actions or strategies were considered in various combinations in up to 4 corridors. Nearly half of the transportation effectiveness measures were direct outputs from a regional travel forecasting model, while other measures were qualitative ratings assigned by project staff.

This section summarizes the transportation forecast methods and results, and describes the rationale for the qualitative ratings that were assigned. This chapter presents the findings somewhat in duplicate. In Section 6.2, the results by corridor are provided, matching the way the Committee organized its recommendations. Section 6.3 is organized by measure, and then by solution set, showing the range of potential effects system-wide.

Travel forecasts for solution sets were intended to provide a consistent measure of the potential trip demand that would result under each solution set. Tabular summaries of the forecast results are provided in Tables 6-1 through 6-5. Committee members were advised that the forecast results were provided without additional refinement or analysis. They were also told that additional analysis would be needed to determine effects on the regional system because the regional model would not directly identify specific operational problems that could occur. For that reason, a number of the qualitative measures were developed specifically to help inform the committee about likely operational, safety and other system performance issues.

For instance, through earlier presentations on the regional system, staff described how bottlenecks on one corridor could constrain operations on another (a review of the existing bottlenecks was provided in Chapter 2, Transportation Setting.) Later, during the solution set evaluations, staff used the travel forecast volumes to predict likely location-specific or system operational effects that could result from each solution set, and they estimated the potential severity of the effect. This analysis (Appendix 5) was a primary element of the ratings for system compatibility and reliability; these and other measures reflected typical operational and safety issues that would be studied in more detail during preliminary engineering and EIS analyses.

The discussions below begin by describing the range of results that were found by corridor among all of the solution sets. The next section then describes how the regional travel forecasting model was applied to the solution sets. Subsequent sections, organized by evaluation measure, recap the major transportation system changes under each solution set.

At committee request, staff also modeled a number of additional scenarios that focused on one action rather than a combination of actions. This "sensitivity analysis" allowed the effects of individual actions on a corridor to be reviewed without interference from actions in other corridors or at the system level. The sensitivity results are discussed below by corridor, and are included in the discussion of traffic forecasts. Table 6-5 shows the results in tabular form.

Table 6-1. Daily Trans-Lake Person-Trips by Alternative, Facility and Mode

Facility/ Transportation Mode	1995 Model Results	2020 No-Action	2020 MTP Revised	2020 MTP Flipped Revised	2020 Roadway/ Bus	2020 Roadway/ Rail	2020 New Crossing	2020 Maximize Alternatives
SR 522								
Non-HOV[1]	60,600	90,200	90,100	90,200	74,900	88,100	77,700	65,200
Commercial	7,000	10,700	10,600	10,700	7,600	10,400	8,200	8,000
HOV 3+	700	2,600	1,600	1,600	16,900	2,600	1,600	1,600
Bus Transit	2,100	3,400	10,100	10,300	7,300	9,900	8,500	14,500
Total All Modes	**70,400**	**106,900**	**112,400**	**112,800**	**106,700**	**111,000**	**96,000**	**89,300**
SR-520 Crossing								
Non-HOV[1]	103,900	115,600	127,100	127,600	119,100	164,400	115,500	26,000
Commercial	23,500	30,800	33,400	33,500	27,600	40,400	30,200	10,900
HOV 3+	1,600	12,000	44,800	33,800	19,900	25,200	43,200	67,800
Bus Transit	8,200	17,100	21,100	2,700	20,900	2,100	6,300	18,900
Rail Transit	—	—	—	20,400	—	18,800	—	—
Total All Modes	**137,200**	**175,500**	**226,400**	**218,000**	**187,500**	**250,900**	**195,200**	**123,600**
I-90 Crossing								
Non-HOV[1]	125,100	162,600	165,400	166,300	139,200	157,900	157,900	45,400
Commercial	26,900	37,400	38,200	38,600	32,300	36,400	36,300	10,700
HOV 3+	2,600	36,000	6,300	21,500	20,500	18,900	7,300	1,000
Bus Transit	7,800	19,500	600	19,600	21,200	2,800	—	—
Rail Transit	—	—	17,100	—	—	17,500	21,600	29,700
Total All Modes	**162,400**	**255,500**	**227,600**	**246,000**	**213,200**	**233,500**	**223,100**	**86,800**
New Crossing at Sand Point								
Non-HOV[1]	—	—	—	—	154,500	—	64,300	—
Commercial	—	—	—	—	30,000	—	10,300	—
HOV 3+	—	—	—	—	14,500	—	1,600	—
Bus Transit	—	—	—	—	5,400	—	400	—
Rail Transit	—	—	—	—	—	—	11,300	—
Total All Modes	**—**	**—**	**—**	**—**	**204,400**	**—**	**87,900**	**—**
New Bus Ferry (Sand Point/Kirkland)								
Bus Transit	—	—	—	—	200	—	—	0
Total All Modes	**—**	**—**	**—**	**—**	**200**	**—**	**—**	**0**
Total Trans-Lake								
Non-HOV[1]	289,600	368,400	382,600	384,100	487,700	410,400	415,400	136,600
Commercial	57,400	78,900	82,200	82,800	97,500	87,200	85,000	29,600
HOV 3+	4,900	50,600	52,700	56,900	71,800	46,700	53,700	70,400
Bus Transit	18,100	40,000	31,800	32,600	55,000	14,800	15,200	33,400
Rail Transit	—	—	17,100	20,400	—	36,300	32,900	29,700
Total All Modes	**370,000**	**537,900**	**566,400**	**576,800**	**712,000**	**595,400**	**602,200**	**299,700**
Total Region								
Non-HOV[2]	10,906,200	15,920,200	15,878,400	15,876,300	15,877,600	15,872,600	15,874,900	15,808,600
HOV 3+	40,100	234,800	227,300	227,200	228,000	226,500	226,900	247,400
Bus and Rail Transit	283,700	526,900	576,000	578,100	576,200	582,600	579,900	649,500
Total All Modes	**11,230,000**	**16,681,900**	**16,681,700**	**16,681,600**	**16,681,800**	**16,681,700**	**16,681,700**	**16,705,500**

(1) Includes SOVs and 2 person HOVs with an overall AVO of 1.33.
(2) Includes SOVs and 2 person HOVs, and Commercial vehicle trips.

Table 6-2. Daily Trans-Lake Person-Trip Modal Shares by Alternative and Facility

Facility/ Transportation Mode	1995 Model Results	2020 No-Action	2020 MTP Revised	2020 MTP Flipped Revised	2020 Roadway/ Bus	2020 Roadway/ Rail	2020 New Crossing	2020 Maximize Alternatives
SR-522								
Non-HOV[1]	86.1%	84.4%	80.2%	80.0%	70.2%	79.4%	80.9%	73.0%
Commercial	9.9%	10.0%	9.4%	9.5%	7.1%	9.4%	8.5%	9.0%
HOV 3+	1.0%	2.4%	1.4%	1.4%	15.8%	2.3%	1.7%	1.8%
Bus Transit	3.0%	3.2%	9.0%	9.1%	6.8%	8.9%	8.9%	16.2%
Total All Modes	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
SR-520 Crossing								
Non-HOV[1]	75.7%	65.9%	56.1%	58.5%	63.5%	65.5%	59.2%	21.1%
Commercial	17.1%	17.5%	14.8%	15.4%	14.7%	16.1%	15.5%	8.8%
HOV 3+	1.2%	6.8%	19.8%	15.5%	10.6%	10.0%	22.1%	54.9%
Bus Transit	6.0%	9.7%	9.3%	1.2%	11.1%	0.8%	3.2%	15.3%
Rail Transit	—	—	—	9.4%	—	7.5%	—	—
Total All Modes	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
I-90 Crossing								
Non-HOV[1]	77.0%	63.6%	72.7%	67.6%	65.3%	67.6%	70.8%	52.3%
Commercial	16.6%	14.6%	16.8%	15.7%	15.2%	15.6%	16.3%	12.3%
HOV 3+	1.6%	14.1%	2.8%	8.7%	9.6%	8.1%	3.3%	1.2%
Bus Transit	4.8%	7.6%	0.3%	8.0%	9.9%	1.2%	—	—
Rail Transit	—	—	7.5%	—	—	7.5%	9.7%	34.2%
Total All Modes	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
New Crossing at Sand Point								
Non-HOV[1]	—	—	—	—	75.6%	—	73.2%	—
Commercial	—	—	—	—	14.7%	—	11.7%	—
HOV 3+	—	—	—	—	7.1%	—	1.8%	—
Bus Transit	—	—	—	—	2.6%	—	0.5%	—
Rail Transit	—	—	—	—	—	—	12.8%	—
Total All Modes	**—**	**—**	**—**	**—**	**100.0%**	**—**	**100.0%**	**—**
New Bus Ferry (Sand Point/Kirkland)								
Bus Transit	—	—	—	—	100.0%	—	—	—
Total All Modes	**—**	**—**	**—**	**—**	**100.0%**	**—**	**—**	**—**
Total Trans-Lake								
Non-HOV[1]	78.3%	68.5%	67.5%	66.6%	68.5%	68.9%	69.0%	45.6%
Commercial	15.5%	14.7%	14.5%	14.4%	13.7%	14.6%	14.1%	9.9%
HOV 3+	1.3%	9.4%	9.3%	9.9%	10.1%	7.8%	8.9%	23.5%
Bus Transit	4.9%	7.4%	5.6%	5.7%	7.7%	2.5%	2.5%	11.1%
Rail Transit	—	—	3.0%	3.5%	—	6.1%	5.5%	9.9%
Total All Modes	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total Region								
Non-HOV[2]	97.1%	95.4%	95.2%	95.2%	95.2%	95.1%	95.2%	94.6%
HOV 3+	0.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.5%
Bus and Rail Transit	2.5%	3.2%	3.5%	3.5%	3.5%	3.5%	3.5%	3.9%
Total All Modes	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

(1) Includes SOVs and 2 person HOVs with an overall AVO of 1.33.
(2) Includes SOVs and 2 person HOVs, and Commercial vehicle trips.

Table 6-3. Daily Trans-Lake Vehicle-Trips by Alternative, Facility and Mode

Facility/ Transportation Mode	1995 Model Results	2020 No-Action	2020 MTP Revised	2020 MTP Flipped Revised	2020 Roadway/ Bus	2020 Roadway/ Rail	2020 New Crossing	2020 Maximize Alternatives
SR-522								
Non-HOV[1]	45,500	67,800	67,700	67,800	56,300	66,200	58,400	49,000
Commercial	7,000	10,700	10,600	10,700	7,600	10,400	8,200	8,000
HOV 3+	200	800	500	500	5,300	800	500	500
Total All Modes[2]	**52,700**	**79,300**	**78,800**	**79,000**	**69,200**	**77,400**	**67,100**	**57,500**
SR-520 Crossing								
Non-HOV[1]	78,100	86,900	95,500	95,900	89,500	123,600	86,800	19,500
Commercial	23,500	30,800	33,400	33,500	27,600	40,400	30,200	10,900
HOV 3+	500	3,800	14,200	10,700	6,300	8,000	13,700	21,500
Total All Modes[2]	**102,100**	**121,500**	**143,100**	**140,100**	**123,400**	**172,000**	**130,700**	**51,900**
I-90 Crossing								
Non-HOV[1]	94,000	122,200	124,300	125,000	104,600	118,700	118,700	34,100
Commercial	26,900	37,400	38,200	38,600	32,300	36,400	36,300	10,700
HOV 3+	800	11,400	2,000	6,800	6,500	6,000	2,300	300
Total All Modes[2]	**121,700**	**171,000**	**164,500**	**170,400**	**143,400**	**161,100**	**157,300**	**45,100**
New Crossing at Sand Point								
Non-HOV[1]	—	—	—	—	116,100	—	48,300	—
Commercial	—	—	—	—	30,000	—	10,300	—
HOV 3+	—	—	—	—	4,600	—	500	—
Total All Modes[2]	—	—	—	—	**150,700**	—	**59,100**	—
New Bus Ferry (Sand Point/Kirkland)								
Total All Modes[3]	—	—	—	—	—	—	—	—
Total Trans-Lake								
Non-HOV[1]	217,600	276,900	287,500	288,700	366,500	308,500	312,200	102,600
Commercial	57,400	78,900	82,200	82,800	97,500	87,200	85,000	29,600
HOV 3+	1,500	16,000	16,700	18,000	22,700	14,800	17,000	22,300
Total All Modes[2]	**276,500**	**371,800**	**386,400**	**389,500**	**486,700**	**410,500**	**414,200**	**154,500**
Total Region								
Non-HOV[2]	8,140,400	12,021,400	12,019,500	12,017,600	12,015,800	12,013,600	12,017,000	—
HOV 3+	12,400	71,200	69,000	69,000	69,200	68,700	68,900	—
Total All Modes	**8,152,800**	**12,092,600**	**12,088,500**	**12,086,600**	**12,085,000**	**12,082,300**	**12,085,900**	—

(1) Includes SOVs and 2 person HOVs with an overall AVO of 1.33.
(2) Includes SOVs, 2 person HOVs and Commercial vehicle-trips.
(3) Excludes Transit Vehicle-Trips.

Table 6-4. PM Peak Period VMT, VHT, and Average Speeds by Alternative and Facility

Facility/ Transportation Mode	1995 Model Results	2020 No-Action	2020 MTP Revised	2020 MTP Flipped Revised	2020 Roadway/ Bus	2020 Roadway/ Rail	2020 New Crossing	2020 Maximize Alternatives
SR-522								
Vehicle Miles Traveled (VMT)	234,800	455,900	400,800	394,800	270,800	356,500	313,100	284,100
Vehicle Hours of Travel (VHT)	9,000	27,300	20,200	20,000	13,700	18,200	15,500	14,300
Average Speed	26.1	16.7	19.8	19.7	19.8	19.6	20.2	19.9
SR-520 Crossing								
Vehicle Miles Traveled (VMT)	427,400	450,200	475,400	473,500	598,700	777,000	457,100	111,100
Vehicle Hours of Travel (VHT)	16,900	27,400	27,200	27,300	28,800	40,500	24,200	7,900
Average Speed	25.3	16.4	17.5	17.3	20.8	19.2	18.9	14.1
I-90 Crossing								
Vehicle Miles Traveled (VMT)	681,700	966,500	906,000	908,700	718,700	862,000	844,700	227,600
Vehicle Hours of Travel (VHT)	23,800	48,300	42,100	42,300	30,600	38,600	38,100	12,100
Average Speed	28.6	20.0	21.5	21.5	23.5	22.3	22.2	18.8
New Crossing at Sand Point								
Vehicle Miles Traveled (VMT)	—	—	—	—	783,200	—	358,600	—
Vehicle Hours of Travel (VHT)	—	—	—	—	32,700	—	15,900	—
Average Speed	—	—	—	—	24.0	—	22.6	—
Total Trans-Lake								
Vehicle Miles Traveled (VMT)	1,343,900	1,872,600	1,782,200	1,777,000	2,371,400	1,995,500	1,973,500	622,800
Vehicle Hours of Travel (VHT)	49,700	103,000	89,500	89,600	105,800	97,300	93,7002	34,300
Average Speed	27.0	18.2	19.9	19.8	22.4	20.5	21.1	18.2
Total Region								
Vehicle Miles Traveled (VMT)	20,651,500	32,558,100	32,593,600	32,602,600	32,724,400	32,682,900	32,607,200	31,978,700
Vehicle Hours of Travel (VHT)	778,700	1,621,200	1,547,900	1,549,000	1,533,400	1,550,800	1,538,800	1,493,900
Average Speed	26.5	20.1	21.1	21.0	21.3	21.1	21.2	21.4
Daily Vehicle Miles Traveled	67,663,900	104,849,200	104,846,300	104,883,000	105,318,800	105,133,000	104,891,900	102,830,800
Daily Vehicle Hours of Travel	2,285,800	4,115,400	4,033,000	4,034,700	4,010,300	4,038,700	4,020,100	3,933,300
Daily Average Speed	29.6	25.5	26.0	26.0	26.3	26.0	26.1	26.1

Table 6-5. Selected Sensitivity Tests – Daily Trans-Lake Person-Trips by Facility and Mode

			MTP Sensitivity Test		Maximize Alternatives Sensitivity Tests		
Facility/ Transportation Mode	1995 Model Results	202 No-Action	2020 MTP Revised (Reference)	Convert HOV Lane to Transit Only	2020 Maximize Alternatives (Reference)	Toll Only/No Lane Conversion[1]	HOV Lane Conversion/ No Toll[2]
SR 522							
Non-HOV[3]	60,600	90,200	90,100	90,400	65,200	61,600	89,200
Commercial	7,000	10,700	10,600	10,700	8,000	7,400	10,500
HOV3+	700	2,600	1,600	2,300	1,600	1,800	1,600
Bus Transit	2,100	3,400	10,100	9,900	14,500	12,900	11,400
Total All Modes	**70,400**	**106,900**	**112,400**	**113,300**	**89,300**	**83,700**	**112,700**
SR 520 Crossing							
Non-HOV[3]	103,900	115,600	127,100	124,000	26,000	39,200	64,300
Commercial	23,500	30,800	33,400	33,200	10,900	13,400	20,700
HOV3+	1,600	12,000	44,800	13,900	67,800	7,500	42,100
Bus Transit	8,200	17,100	21,100	23,700	18,900	10,500	14,600
Total All Modes	**137,200**	**175,500**	**226,400**	**194,800**	**123,600**	**70,600**	**141,700**
I-90 Crossing							
Non-HOV[3]	125,100	162,600	165,400	163,100	45,400	40,300	157,900
Commercial	26,900	37,400	38,200	38,100	10,700	8,700	37,900
HOV 3+	2,600	36,000	6,300	21,200	1,000	6,000	6,800
Bus Transit	7,800	19,500	600	1,000	—	—	—
Rail Transit	—	—	17,100	16,900	29,700	29,400	24,200
Total All Modes	**162,400**	**255,500**	**227,600**	**240,300**	**86,800**	**84,400**	**226,800**
New Crossing at Sand Point							
Non-HOV[3]	—	—	—	—	—	—	—
Commercial	—	—	—	—	—	—	—
HOV 3+	—	—	—	—	—	—	—
Bus Transit	—	—	—	—	—	—	—
Rail Transit	—	—	—	—	—	—	—
Total All Modes	—	—	—	—	—	—	—
New Bus Ferry (Sand Point/Kirkland)							
Bus Transit	—	—	—	—	0	0	0
Total All Modes	—	—	—	—	**0**	**0**	**0**
Total Trans-Lake							
Non-HOV(3)	289,600	368,400	382,600	377,500	136,600	141,100	311,400
Commercial	57,400	78,900	82,200	82,000	29,600	29,500	69,100
HOV 3+	4,900	50,600	52,700	37,400	70,400	15,300	50,500
Bus Transit	18,100	40,000	31,800	34,600	33,400	23,400	26,000
Rail Transit	—	—	17,100	16,900	29,700	29,400	24,200
Total All Modes	**370,000**	**537,900**	**566,400**	**548,400**	**299,700**	**238,700**	**481,200**

(1) Removes the HOV lane conversion component of "Maximize Alternatives" thereby eliminating all un-tolled cross-lake HOV lanes (HOVs must now use general-purpose lanes and pay the toll).

(2) Removes the toll component of "Maximize Alternatives" but retains the HOV lanes created by lane conversion.

(3) Includes SOVs and 2 person HOVs with an overall AVO of 1.33.

6.1 Travel Demand Forecasting Methods

The PSRC's travel forecasting model was used to estimate year 2020 travel conditions for the Trans-Lake Study. A model forecasting methodology report was prepared for the study, and is provided in Appendix 4.

The project team validated PSRC's model to 1995 conditions prior to applying it to forecast travel conditions for the year 2020; for comparison, the 1995 baseline values were also provided to the committee. The project team used 1995 values for validation because they were the most consistent data available for Trans-Lake travel. PSRC's travel demand forecasting model, which covers a four-county region, is a multimodal model that captures both regional and corridor level tripmaking, and predicts auto, carpool, and transit demand. For this study, the model also produced additional values that were used for comparing the effectiveness of the solution sets. These values included weighted average travel times between activity centers, mode share, vehicle miles of travel (VMTs) and vehicle hours of travel (VHTs). At a later stage in an EIS, more detailed traffic operational modeling and analysis would be expected to assess more localized traffic conditions.

For the Trans-Lake Washington Study, PSRC's existing model as of spring 1999 was applied. This version of the model has been in general use throughout the region for several years. PSRC has been in the process of revising and validating its model, but at the time of the Trans-Lake Washington Study, the model had not yet been released for general use. For this reason, project staff refined the existing PSRC model for use in the Trans-Lake Washington Study. The major refinements, which focused on providing more realistic estimates of current travel patterns within the study area, included:

- Updating the transit network to reflect 1995 bus schedules, and adding transit network detail for cross-lake travel.

- Using 1995 traffic data for the model's estimates of cross-lake trips based on current conditions.

- Adjusting the PSRC mode choice model to match the estimates of transit trips that have recently been produced by the Sound Transit model. (Sound Transit has developed a more detailed transit model, which has undergone substantial model validation.)

- Adjusting the relative speeds and capacities of freeways and arterials in the study area to improve the way the model assigns traffic to various facilities.

For each solution set, the assumptions of the model were further adjusted to reflect proposed changes to the regional network. These changes are described in general terms in Section 6.2.1 below. Details were based on the solution set definitions (Appendix 2) and included features such as:

- The number of lanes, speeds, capacities, type of roadway facility, as well as the length of the improvements for proposed new highway or HOV facilities.

- Changes to the transit system, including new routes or modifications to existing routes, as well as changes to operating speeds and/or headways. The degree of grade separation and expected travel times of any proposed rail lines was also specified.

- Any changes to auto operating or parking costs, proposed tolls, changes in transit fares, and other factors to reflect increased or decreased emphasis on TDM strategies. In some cases, such as tolls, the model used surrogate factors in the model. For instance, a $5.00 round-trip toll was factored into the model as a 20-minute travel time penalty. The factor was based on an assumption of the cost value of time, considering the medium household income in the region.

The PSRC model also includes assumptions about area population and employment growth. The model's assumptions are based on the comprehensive plans adopted by area jurisdictions as of 1995. The assumptions were not revised or adjusted under any of the solution sets evaluated in the Trans-Lake Washington Study. However, as the Study Committee noted in the problem statement and in their recommendations, changes to land use could have a significant impact on future Trans-Lake travel conditions. Future forecasts for travel on Trans-Lake facilities could be affected by updated land use assumptions, or by changes in the adopted comprehensive plans.

6.1.1 Major System Changes by Solution Set

The No Action solution set would include very minimal changes to the freeway network in the Trans-Lake Washington Study area. There would be no appreciable change in capacity on Trans-Lake facilities. The roadway improvements that are currently planned and funded for a number of arterials in the project area are not expected to cause significant changes in Trans-Lake travel patterns or travel demand. The major regional improvements are primarily related to the Sound Move transit program. By 2010, Sound Transit will provide Sounder Commuter Rail service for Tacoma, Seattle and Everett, and Link light rail service will connect SeaTac, downtown Seattle, and the University District in Seattle. Sound Transit will also provide Regional Express bus service along SR 522, I-405, SR 520, I-90 and I-5, with improved connections between major urban centers in the region. Although these new regional transit services would improve mobility and would increase the person-carrying capacity along the I-5 corridor, they are not expected to relieve congestion on regional highways.

The MTP '98 solution set was developed to mirror the approach taken by the MTP as of 1995. The regional transportation plan employs a long-range strategy that would coordinate development patterns, transportation system investments, and demand management strategies to meet year 2020 transportation needs. The transportation system investments are focused on creating more extensive high-capacity transportation systems (HOV, transit), and on enhancing existing facilities. Most of the elements for the MTP '98 solution set are based on the MTP of 1995, with some adjustments to reflect changes in projects and plans that have occurred since that time. The most significant change for the MTP '98 solution set was to reduce the assumptions the MTP had made for the regional high-capacity system; a light rail line running the length of I-405 was not assumed in the solution set. Compared to No Action, the primary improvements for the MTP '98 solution set is the addition of HOV lanes across SR 520,

and a rail connection between Seattle and the East Side, via I-90. However, since MTP '98 assumes that the center roadway of I-90 would be closed to vehicle travel, including bus transit or HOV, there would be no net increase in HOV facilities across the lake under a MTP '98 scenario.

The MTP Flipped solution set would place a regional rail line on the SR 520 corridor instead of on I-90. It would also retain the HOV lanes proposed in MTP '98 for SR 520, and assumes two-way HOV operations on I-90's center roadway. The MTP '98 and MTP Flipped scenarios are otherwise similar. This allowed committee members to compare the relative effect that a SR 520 corridor rail line would have on HOV and general-purpose lanes on SR 520. It also allowed a relative comparison of performance on the I-90 corridor with light rail and no center roadway, or with a center roadway and no light rail.

The Roadway/Bus solution set would include substantial increases in roadway capacity for Trans-Lake travel. There would be HOV lanes on each Trans-Lake facility, and a new freeway would connect North Seattle and Kirkland. A total of 20 general-purpose lanes and eight HOV lanes would serve Trans-Lake travel needs. Total Trans-Lake general-purpose capacity would increase by three lanes in each direction (one on SR 520 and two lanes on new freeway). Trans-Lake HOV capacity would increase by three HOV lanes in each direction (on SR 520, on the new freeway and on SR 522/SR 523).

The Roadway/Rail solution set would increase Trans-Lake general-purpose capacity above No Action levels by providing two new general-purpose lanes on SR 520; total person-carrying capacity would also increase from the addition of two new rail lines across Lake Washington. Since one of the new rail routes would be along I-90, the center roadway would not be available for other vehicles. Although general-purpose capacity would increase across the lake, the total number of lanes across the lake would be unchanged. There would also be no HOV facilities for cross-lake travel in this solution set.

The New Crossing solution set would increase vehicular and person carrying capacity over No Action by providing four new general-purpose travel lanes, two new HOV lanes, and two rail corridors across the lake. Several of the proposed elements are similar to those considered in other solution sets, including an I-90 light rail line in the center roadway, added HOV lanes for SR 520, and transit-related treatments for SR 522. The major difference would be in the new crossing itself. The four new lanes across the lake would be part of a new arterial roadway and would not directly connect to any of the major regional freeways. A second light rail crossing would share the new arterials' bridge, and would be further north than any other proposed light rail route.

The Maximize Alternatives solution set proposed a system that would reduce general-purpose capacity across the lake, while maintaining a total of two HOV lanes across the lake, and providing two new light rail lines and a new ferry link. The solution set had a heavy emphasis on TDM measures to help reduce the demand for general-purpose travel across the lake, and encourage the use of HOV and transit. To simulate the increased emphasis on TDM, model forecasts assumed a $5.00 round trip toll (using a 20-minute increase in travel time as a surrogate factor in the model), and a $0.50 daily increase in parking costs. At the facility level, the most significant physical change would occur on SR 520, where one general-purpose lane would be converted to HOV in each direction. The solution set also featured two new light rail lines that would function in their own

right-of-way, allowing higher travel speeds. Overall, the total number of lanes across the lake would be lower than any other alternative, including No Action. While the number of HOV lanes across the lake would remain the same as in current conditions, the solution set would have two fewer general-purpose lanes.

6.2 Summary of Findings by Corridor

6.2.1 SR 522

The SR 522 corridor was found to have very little variance in terms of transportation effects that would occur among the seven solution sets that were evaluated. Both forecast results and qualitative ratings were similar under all solution sets. Some solution sets, particularly those with a new roadway or freeway between SR 522 and SR 520, would reduce some travel demand on SR 522, but the corridor would still operate with congested conditions for general-purpose travel. While a portion of SR 522's HOV travel was attracted by actions in other corridors, SR 522's transit demand remained generally constant in the 8 to 10 percent of total trips range. The highest level of HOV and transit use would occur under a scenario that provided HOV facilities along SR 522 and SR 523 (NE 145th Street), with direct HOV access to I-5. The HOV improvements, along with corresponding increases in transit service, resulted in a significant increase in HOV trips and bus ridership. In other solution sets, the completion of the transit only lanes between I-5 and I-405 would account for a 3 to 6 percent increase in person throughput.

On SR 522, no major regional modifications were proposed in any of the solution sets; therefore, no changes to the bottleneck locations are anticipated. Severity of bottlenecks was anticipated to be slightly reduced on SR 522 in the New Crossing and Road/Bus solution sets. Both of these solution sets proposed new capacity across Lake Washington that would attract traffic from the SR 522 corridor and reduce its demand. However, volume to capacity ratios indicate that while the peak period would be slightly shortened, congested conditions would still be the norm at peak periods.

6.2.2 Range of Effects on SR 520

The SR 520 corridor considered five different treatments to the highway, with two solution sets offering light rail on an adjacent parallel route. No Action considered the highway "as is" with two general-purpose lanes in each direction, with a segment of westbound HOV approaching the lake and a segment of eastbound HOV from 105th to West Lake Sammamish. Three alternatives (MTP '98, MTP Flipped, and New Crossing) proposed adding an HOV lane in each direction to SR 520 (including the bridge section), and MTP Flipped also included light rail. Roadway/Rail considered adding one general-purpose lane each way to SR 520, and included light rail. Roadway/Bus considered adding a general-purpose lane and an HOV lane each way, and Maximize Alternatives considered converting one general-purpose lane each way to HOV.

Sensitivity tests performed on SR 520 also examined the effects of adding transit-only lanes, and separated the effects of tolls from converting an existing general-purpose lane to HOV.

Person throughput along SR 520 ranged from an increase of 7 to 30 percent when the solution sets were compared to No Action. Throughput would be reduced by 30 percent by the conversion of a general-purpose lane to HOV (as in Maximize Alternatives), which was considered with the implementation of transportation pricing measures, including tolls and increased parking fees. A sensitivity test later showed that person throughput would decrease by 14 percent if the conversion only occurred.

Transit and HOV demand on the corridor remained strong regardless of actions taken on other corridors, and did not depend on the presence of light rail. Transit's mode share, already at 6 percent of daily person trips in 1995, would increase to nearly 10 percent in 2020 with No Action. The addition of HOV lanes could increase transit share to nearly 11 percent (MTP '98), and the combination of HOV lanes and light rail provided transit shares also in the 10 to 11 percent range.

Similarly, the HOV share, which was less than 1 percent in 1995, would increase substantially in 2020 to nearly 7 percent with No Action. All of the solution sets that added HOV lanes posted daily shares ranging from 15 to 22 percent for HOV travel, depending on other corridor effects (not including Maximize Alternatives which also used applied tolls). Even the solution set that did not offer HOV lanes showed strong demand for HOV travel on SR 520: Roadway/Rail would have a 10 percent daily share. A transit-only lane, as considered in sensitivity tests performed at committee requests, showed that a transit only lane would reduce HOV traffic by 10,000, compared to MTP '98, which added an HOV lane. Transit ridership would increase about 12 percent, but the overall effect on person throughput would be 14 percent less than MTP '98.

Bottlenecks on SR 520 for three of the solution sets would be anticipated at locations similar to today. For solutions with added HOV, the new lane would provide capacity for approximately 1,500 more vehicles per hour (for vehicles with three or more passengers). The transportation model predicted that new HOV lanes would be below or near capacity in one or both directions in several solution sets. However, the general-purpose lanes would remain highly congested, and their operations could negatively impact travel in the HOV lanes.

Solution sets that would add general-purpose capacity would be expected to operate above or near capacity for considerably more than three hours in the peak periods. Connections to I-405 and I-5 would continue to be the major operational bottlenecks. For instance, Roadway/Rail, which would provide a general-purpose lane and rail to SR 520, would attract traffic volumes that would exceed the capacity of the new general-purpose lane and the existing lanes, and heavy congestion would exist throughout an extended peak period. Existing bottleneck locations would be aggravated, including areas between 124th Avenue NE and I-405, I-405 and 108th Avenue NE, at the bridge abutments, and at the connections to I-5 and I-405.

The conversion of a general-purpose lane to HOV use (as in Maximize Alternatives) would be expected to impose a major capacity constraint on both the SR 520 corridor and the surrounding system. The result would be queue distances that would more than double those found today. Maximize Alternatives also included substantial demand-reduction factors, but volumes were still considerably above capacity for the remaining general-purpose lane. Travel demand for solutions could reduce further because of the poor reliability and extensive travel time impacts, and people would respond by relocating jobs or homes, or changing modes. Sensitivity tests of lane conversion

without the additional demand reduction of tolls would result in worsened conditions for both general-purpose and HOV travelers as operations degrade to stop and go traffic, and overall person throughput would further drop.

6.2.3 I-90

A total of three options were considered for the I-90 corridor, and all involved changes to the center roadway. The roadway could be reserved for light rail, it could remain as it currently operates (reversible operation), or it could be converted to two-way continuous HOV. The forecast results showed that person throughput on I-90 would be greatest if current operations were maintained, and the other approaches would result in throughput that would be less than No Action. These forecasts included the effect of factors including the elimination of HOV lanes, addition of HOV or general-purpose capacity on SR 520, and providing other new roadways across the lake. However, the year 1995 travel forecasting information, while still regionally accepted, does not fully reflect the increasingly balanced travel patterns that now exist across I-90. As the peak directions become more balanced, options that provide continuous two-way operations would be expected to carry more people. Several alternatives also proposed light rail in the center roadway. Forecasts consistently showed that transit ridership would remain similar between alternatives. There was little forecasted differences between alternatives that offered bus with HOV and those that offered light rail.

The regional planning focus of the Trans-Lake Washington Study did not allow a more detailed focus on an extended range of treatments on I-90. A number of other options may be possible that could affect potential person throughput results from either roadway or rail scenarios. For instance, the analysis did not assume that the outer roadway operations would be changed, although a similar option has been under consideration in the I-90 Access Study (described in Chapter 1, Planning context.) In addition, rail forecasts could improve with more detailed planning of transit networks, and with modeling adjustments that include recent changes in both local and regional transit networks.

Travel demand forecast results consistently showed that if HOV facilities were completely removed from I-90, the corridor would carry fewer vehicles, those vehicles would carry fewer passengers, and fewer people overall utilize the corridor. Some of I-90's HOV demand could shift to SR 520 or a new freeway if travel time advantages to HOV were available.

6.2.4 A New Freeway

A New Freeway was an element of the Roadway/Bus solution set, that offered substantial Trans-Lake capacity expansion and improved HOV connections in other corridors. The solution set overall increased Trans-Lake travel volumes by nearly a third, and increased person carrying performance of the solution set to a slightly lesser degree because of increases in general-purpose travel. These benefits were offset by predictions of worsened regional congestion that would occur at connecting facilities like I-5 and I-405.

The travel time results for the solution set were lower than several of the other solution sets, including No Action. Although the travel time analysis is not broken down by corridor, such a result would indicate that a travel time benefit could be offered to a substantial number of Trans-Lake travelers if a new link existed in the Kirkland area. However, since the regional transportation model does not evaluate the effects of roadway connections, potential delays at interchanges and congested freeways were not included in the travel time calculations.

Analysis of traffic operations and roadway geometrics for the New Freeway showed that the highway would not be able to deliver the travel times estimated by the model. Where the New Freeway connects with I-5 and I-405, substantial operational problems would be expected, and failing service levels would occur during the peak periods. For instance, planning-level calculations showed at least 4,500 vehicles during the peak hour would be trying to access an already congested portion of I-405; this level of traffic would clearly exceed the capacity available on a two-lane on-ramp. Similar or worse effects could occur for movements to and from the I-5 corridor, where 3,200 vph or 1½ lanes worth of traffic could be coming onto an already severely congested freeway segment. On both I-5 and I-405, existing interchanges north and south of the New Freeway connections are close enough to make different design approaches (lengthened ramps or collector/distributor lanes) unlikely. The increased volumes from the New Corridor would also aggravate a wide range of other operational issues at access and exit points to the north and south of the New Freeway.

With a New Freeway, bottlenecks would occur at I-5, Sand Point Way, and I-405. With the assumed design configurations, added queues of 1.5 miles and 3.0 miles in the westbound and eastbound directions could occur during the PM peak hour of operation. It is anticipated that this level of traffic congestion could substantially exacerbate peak period conditions. The anticipated negative operating effects of the New Freeway were a large factor in the low system compatibility and reliability ratings that were assigned.

6.2.5 A Kirkland-Sand Point New Arterial

Under New Crossing, a new arterial from Kirkland to Sand Point is anticipated to carry nearly ¾ as many vehicles as the SR 522 corridor. Limitations to the operations of this new arterial are anticipated at the end points with Sand Point Way on the west side and NE 124th Street on the east side of Lake Washington. Both of the corridors proposed for connection operate near capacity with existing traffic and would require significant modification in order to address the newly generated traffic.

6.3 Results by Evaluation Measure

The results for each of the transportation effectiveness evaluation measures provided to the committee members are described below. The results are described by measure, although it should be noted that the initial set of materials provided to the committee members was organized by solution set. In addition to the solution set report cards, four tables of travel forecasting results (Tables 6-1 through 6-5) were also given to the committee; these tables made it easier to compare the performance of all the solution sets by corridor, for all Trans-Lake, and for the total region. In the discussions below, the major differences in the results for each of the measures are described, and any outstanding technical issues are also identified.

6.3.1 Vehicle Trip Throughput

The committee members were given daily and evening peak period vehicle volumes for Trans-Lake travel in the year 2020, along with the percentage of daily vehicles by mode. The daily and peak period vehicle trip results are shown in Table 6-6 below. Figure 6-1 shows how the vehicle trip forecasts correlated to mode share.

Table 6-6. Daily and PM Peak Period Traffic Forecasts

Daily Volumes	No Action	MTP '98	MTP-Flipped	Roadway/ Rail	Roadway/ Bus	New Crossing	Maximize Alternatives
SR 522	79,300	78,800	79,000	77,400	69,200	67,100	57,500
Kirkland-Sand Point Roadways					150,700	59,100	
SR 520	121,500	143,100	140,100	123,400	172,000	121,500	51,900
I-90	171,000	164,500	170,400	143,400	161,100	157,300	45,100
Solution Set Total	**371,800**	**386,400**	**389,500**	**410,500**	**486,700**	**405,000**	**154,500**
Peak Volumes							
SR 522	23,800	24,200	24,200	24,400	24,300	21,700	19,100
Kirkland-Sand Point Roadways					38,900	19,100	
SR 520	33,000	40,400	38,700	49,900	39,800	38,000	17,100
I-90	48,000	45,200	47,000	45,100	41,700	43,700	13,800
Solution Set Total	**104,800**	**109,800**	**109,900**	**118,100**	**144,700**	**122,500**	**50,000**

All of the solution sets showed a substantial increase in daily and peak period travel on Trans-Lake facilities between 1995 and 2020, except for Maximize Alternatives. By 2020, nearly 95,000 more daily trips across or around the lake would occur with No Action (a nearly 35 percent increase over 1995 conditions). Solution sets that advocated HOV improvements only (MTP '98, MTP Flipped) would result in slightly higher rates of traffic growth (40 to 41 percent increases over 1995). The solution sets that added new general-purpose capacity resulted in the highest increases in daily and peak period vehicle trips. Roadway/Bus, which featured a new freeway crossing, additional general-purpose and HOV lanes on SR 520, and maintained the center roadway on I-90, had the highest number of trips (486,700 or nearly 65 percent more trips than in 1995). Maximize Alternatives, which would reduce existing system general-purpose capacity and impose demand-reducing measures, was shown to reduce daily travel by nearly 55 percent.

The model forecasts also showed that some travel pattern changes occurred in some of the solution sets. Changes occurred in the modal shares experienced in each corridor, and in the distribution of trips across all Trans-Lake corridors, depending on the actions or groups of actions that would occur (see Figure 6-1a). The No Action alternative is compared to 1995 conditions; all other solution sets are compared to the No Action results. Considered by solution set, the model results included the following:

Figure 6-1
A Comparison of Daily Trans-Lake Vehicle Trips by Solution Set

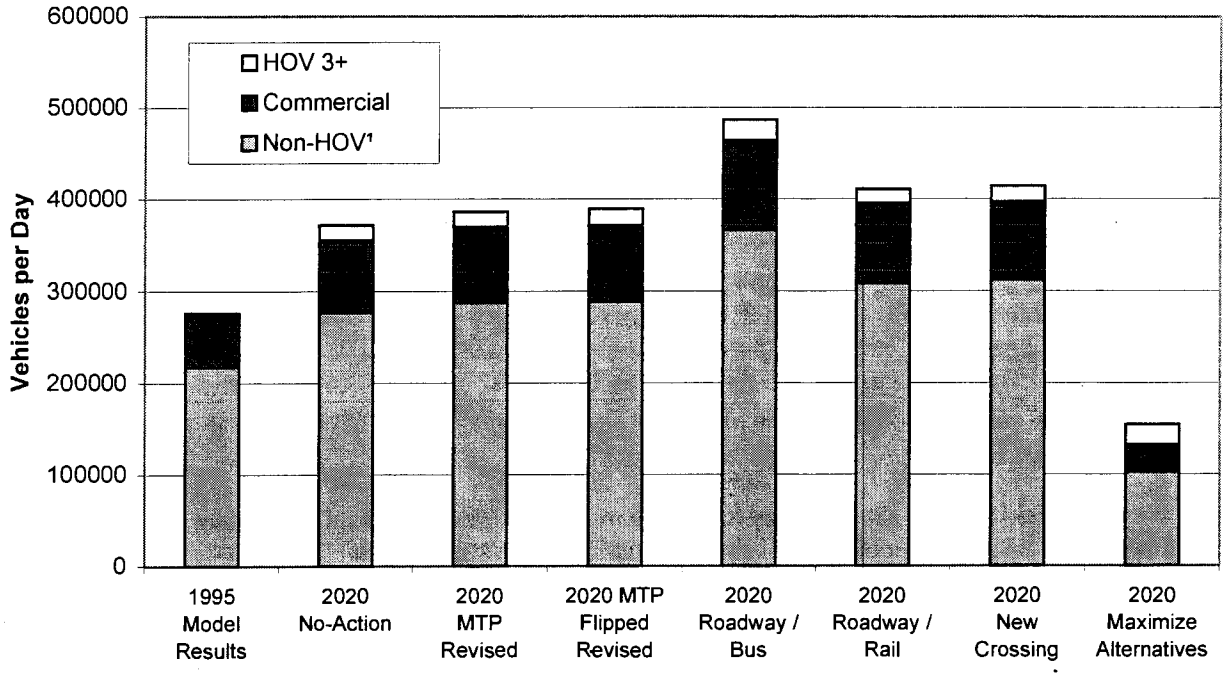
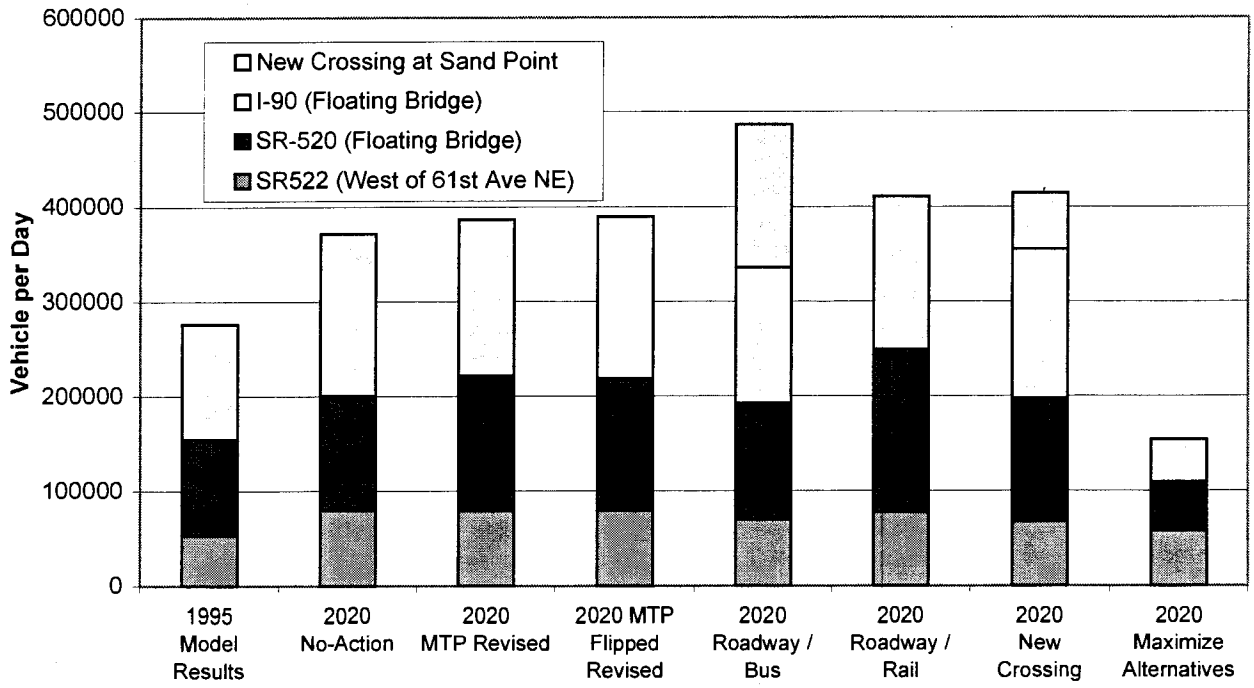


Figure 6-1a
A Comparison of Trip Distribution Patterns by Solution Set



No Action – Although few new facilities would be introduced in No Action, travel volumes would increase by 35 percent by 2020 compared to 1995. As all Trans-Lake facilities were at or near capacity in 1995, the increased volumes in 2020 would result in more severe and extended periods of congestion. The model shows that a larger percentage of trips would be made using HOV and transit modes, where travel time advantages would be available. Overall, HOV share would increase to over 4 percent of total daily vehicle trips, from less than 1 percent of total daily trips in 1995. Most of the gains in HOV share would be on SR 520 and I-90. SR 522 daily general-purpose vehicle trip volumes would increase 30 percent over 1995 levels, and the proportion of general-purpose vehicle trips would still account for over 90 percent of daily traffic because there would be few travel time advantages to HOV vehicles. On SR 520, overall trips would increase by nearly 20 percent (to 121,500), but congestion would reduce the proportion of daily general-purpose vehicle trips to 71 percent of total trips (compared to 76 percent in 1995). Overall trips on I-90 would increase by 40 percent over 1995 (to 171,100), but the proportion of general-purpose trips on I-90 would drop to 71.5 (from 77.7 percent in 1995). Congestion would increase the HOV share of vehicle trips (11,400 trips, or 6.7 percent of the total in 2020, compared to 1,500 trips or less than one percent in 1995).

HOV travel (considered as three or more occupants in the model) would increase substantially over 1995 conditions on all three Trans-Lake facilities, especially on I-90. By 2020, Trans-Lake HOV vehicle trips are forecast to increase 300 percent on SR 522, over 600 percent on SR 520 and more than tenfold on I-90. To put these percentages in perspective, SR 522 HOV vehicles would increase from 200 to 800 vehicles, SR 520 HOV vehicles would increase from 500 to 3,800 vehicles, and I-90 HOV vehicles would increase from 800 to 11,400 vehicles. In terms of people served, this equates to over 45,000 people per day.

MTP '98 – Overall, Trans-Lake total trips would increase by nearly 4 percent compared to No Action, with general-purpose vehicle trips that are 3.9 percent higher, and HOV vehicle trips that are 4.3 percent higher. Volumes on SR 522 volumes would remain similar to No Action, SR 520 volumes would increase by 18 percent, but total trips on I-90 would be 4 percent lower due to the loss of the center lanes. SR 522 vehicle mode splits would be similar to No Action, although SR 522 HOV vehicle trips would decrease to 500 daily vehicle trips (compared to 800 in No Action). SR 520 general-purpose vehicle trips would be nearly 10 percent higher with MTP '98 than with No Action due to the increased capacity in the corridor. I-90 general-purpose vehicle trips would be 2 percent higher with MTP '98 than with No Action, but the removal of HOV facilities in the center roadway would reduce HOV traffic from 11,400 to 2,000, or a drop of over 80 percent.

MTP Flipped – Daily Trans-Lake vehicle trips would increase 5 percent over No Action, with 389,500 daily Trans-Lake vehicle trips (this is also about 3,000 more vehicles a day more than the MTP '98 total). Overall, there would be 4.3 percent more general-purpose vehicle trips than No Action (but again about the same as MTP 98), and there would be 12.5 percent more HOV vehicle trips than with No Action. SR 522 vehicle volumes and modal split would be similar to No Action, SR 520 volumes would increase by 15 percent over No Action, and I-90 volumes would be very similar to No Action. SR 522 HOV vehicle trips would drop by 300 (as in MTP '98) because vehicles would be attracted to SR 520 by the new HOV lane travel time benefits. SR 520 would have 10,700 HOV vehicles daily, compared to 3,800 vehicles under No Action.

Although this is about 3,500 vehicles less than with MTP '98, MTP Flipped has two routes for HOV vehicles to use: either I-90 or SR 520. The fact that there are still high volumes on SR 520 reflects a strong demand for HOV travel in that corridor. I-90 would have 6,800 HOV vehicle trips with two-way HOV operations in the center lane, which is 60 percent of the HOV volumes with No Action, where reversible operations would exist. The model forecasts that the lower capacity for directional HOV volumes, along with the new facilities on SR 520, would contribute to the diversion of HOV traffic from I-90 to SR 520.

Roadway/Bus – Total daily Trans-Lake vehicle trips would increase 31 percent over No Action, with approximately 486,745 daily vehicle trips, the most of any solution set. Overall Trans-Lake general-purpose vehicle trips would increase 32 percent and HOV vehicle trips would increase 42 percent, compared to No Action. The new freeway itself would carry 150,700 trips, or about a third of Trans-Lake's total vehicle traffic, which indicates that there would be substantial demand for a corridor in that location. The new freeway and four additional lanes on SR 520 would reduce overall volumes by 13 percent on SR 522, and by 16 percent on I-90. In spite of the expansion on SR 520, only two percent more vehicle trips would occur on SR 520 if a new Kirkland-Sand Point freeway were also available, compared to No Action. In terms of mode split, overall HOV vehicle trips would increase 42 percent, primarily due to the significant increase in HOV capacity on all facilities. General-purpose trips would increase by 32 percent, and commercial trips would increase by 24 percent, compared to No Action.

To break the results down by corridor: SR 522 HOV vehicle trips would increase from 800 to nearly 5,300 daily trips compared to No Action (a 663 percent increase), or nearly 8 percent of total daily traffic on SR 522. SR 520 HOV vehicle trips would increase over 65 percent compared with No Action 2020, but this increase is less than other solution sets with an HOV lane on SR 520 because some HOV trips are diverted to the new corridor. I-90 HOV volumes would be similar to other alternatives with two-way HOV operation in the center lanes, although general-purpose and commercial volumes would decrease. The New Freeway would carry 4,600 HOV vehicle trips, the least of all the Trans-Lake facilities. New Freeway HOV vehicle trips would account for 3 percent of total daily traffic on the New Freeway and for 20 percent of total daily Trans-Lake HOV vehicle trips.

Roadway/Rail – Total Trans-Lake vehicle travel would increase by 11 percent compared to No Action, with more of the traffic accommodated on SR 520. There would be a 2 percent decrease on SR 522, a 6 percent decrease on I-90, and a 42 percent increase on SR 520. In terms of overall mode split changes, there would be a 7 percent drop in HOV vehicle trips, and 11 percent increases in general-purpose and commercial trips. The change can be attributed to the lack of travel time advantages to HOV users, since HOV lanes would not be provided on SR 520 or I-90.

For the results by corridor: there would be little change in SR 522 volumes or mode split compared to No Action. SR 520 would carry 172,000 total trips, or 42 percent more trips than in No Action. On SR 520, HOV trips would increase 42 percent (to 3,800 trips) on SR 520 compared to No Action, although this is a smaller increase than solution sets with an HOV lane. On I-90, general-purpose traffic would decrease 6 percent (to 118,700) compared with No Action; this is likely due to the attraction of an added general-purpose lane on SR 520, and because of a shift to transit on I-90. I-90 HOV vehicle trips would decrease 50 percent.

New Crossing – Total trips under this solution set would increase by 10 percent over No Action. Both SR 522 and SR 520 would experience a decline in traffic (15 percent on SR 522 and 8 percent on SR 520), while I-90 would increase by 9 percent, in spite of the loss of the center roadway capacity to rail. In terms of mode split, general-purpose vehicle trips are expected to increase by 13 percent (to 312,300) over No Action, while HOV trips would drop by 56 percent, to 7,100 vehicles daily. Much of the additional Trans-Lake vehicle trips would be attracted to the new arterial corridor, although some traffic would shift from SR 522 and SR 520.

All corridors would experience a slight decrease in general-purpose traffic due to the new bridge. While SR 522 and I-90 would experience substantial percentage decreases in HOV vehicle volumes (37 percent and 80 percent, respectively), SR 520 would experience a 260 percent increase in HOV vehicle volumes because it would be the only regional corridor with through HOV lanes. (This scenario is very similar to the MTP '98, with the exception of the added arterial and rail crossing between Kirkland and Sand Point.)

Maximize Alternatives – Total Trans-Lake trips would decline by 58 percent from No Action, and were forecast to be over 120,000 vehicles less than current conditions. The decline in volumes and the shifts in trip distribution were quite varied among the corridors. While SR 522 volumes would decrease by 73 compared to No Action (to a level similar to current volumes), SR 520 and I-90 would decline 57 and 74 percent, respectively. The distribution of general-purpose traffic among the three Trans-Lake facilities would be essentially the same as with No Action, although there is a slight shift of general-purpose traffic from SR 520 to I-90. Total general-purpose volumes would be substantially lower on each facility. While general-purpose and commercial trips decrease overall by over one third, HOV trips overall would increase by nearly 40 percent. This is a lower percentage rate increase in HOV trips than for Roadway/Bus, which was at the other end of the solution set spectrum in terms of adding new highway capacity. However, in terms of percentage of overall traffic, Maximize Alternatives would see HOV trips account for 15 percent of daily traffic volumes, which is substantially more than No Action or Roadway Bus, which would both have HOV trips of between 4 and 5 percent of the total.

To consider the effects of Maximize Alternatives by corridor: SR 522 general-purpose vehicle trips would decrease 20 percent, and SR 522 HOV vehicle trips would decrease 63 percent from No Action. SR 520 general-purpose travel would decrease 50 percent, due to a reduction in capacity and the addition of congestion pricing, while HOV vehicle trips would increase 300 percent. I-90 general-purpose daily vehicle trips would decrease 20 percent, although the freeway would carry the majority of general-purpose traffic.

6.3.2 Person Trips and Mode Choice

The committee members were given further detail on person carrying performance (or person trips) by corridor and solution set, and the totals for person trips were also broken down by modal share. Figure 6-2 compares person-trip performance by solution set. The information was given for both daily trips and for evening peak period trips. Morning peak information was also available to the committee, and is provided in Appendix 4, Travel Forecast Results. The evening peak was selected as the primary measure to show the committee as it tended to represent the highest levels of travel, or worst-case volume

conditions. Daily person trips and mode choice were shown in Table 6-1. Evening peak hour person trips and mode choice are charted in Figure 6-3. However, as these results tended to mirror the results of the daily person trip results, they are not separately discussed here.

At the system level, travel volumes under most of the solution sets remained within a range of plus or minus 10 percent for most of the solution sets. Similarly, person throughput (the term used to describe the number of people that a theoretical line, drawn here at mid-lake) by corridor was also found to stay relatively consistent for each of the corridors, although the mode choice often varied considerably depending on the transit or HOV options that were made available. However, the largest changes in mode choice in each corridor appeared to occur because of the specific changes that were made on that corridor. In general, changes to other corridors, particularly SR 522 or a new corridor, did not tend to substantially change mode choice patterns on SR 520, and had even less of an effect on I-90.

No Action – Daily person trips in the No Action scenario would increase to 537,900, a 45 percent increase from the 370,000 trips in 1995. As volumes and congestion increase on the three Trans-Lake facilities (SR 520, I-90, SR 522), peak periods will also extend, and more people are expected to shift from single occupancy vehicle travel to transit and HOV travel. With No Action, transit and HOV person trips would increase from 6 percent of total trips in 1995 to 17 percent of total trips in 2020. This would double transit ridership, and is a ten-fold increase in HOV person trips. The majority of transit ridership growth is expected to occur on I-90, where HOV express lanes would continue to provide time savings over general-purpose travel.

To consider the forecast results by corridor:

- SR 522 total trips would increase by 50 percent, with the largest percentage gains occurring in HOV person trips. They would increase from 700 in 1995 to 2,600 in 2020.

- SR 520 total person trips would increase by 28 percent, compared 1995. Again, the largest increase would be in HOV person trips, which would increase to 12,000 compared to 1,600 in 1995. Transit use would also double. General-purpose trips would increase by 11 percent, a lower rate of growth that reflects the already congested conditions on SR 520.

- I-90 total trips would increase 57 percent. General-purpose and commercial trips would increase here by 30 and 39 percent, respectively. A larger proportion of the increase would be in HOV person trips, which was forecasted to increase nearly 13 times to 36,000 compared to 2,600 in 1995. Transit use would also nearly double.

Figure 6-2
A Comparison of Trans-Lake Daily Person Trips by Solution Set

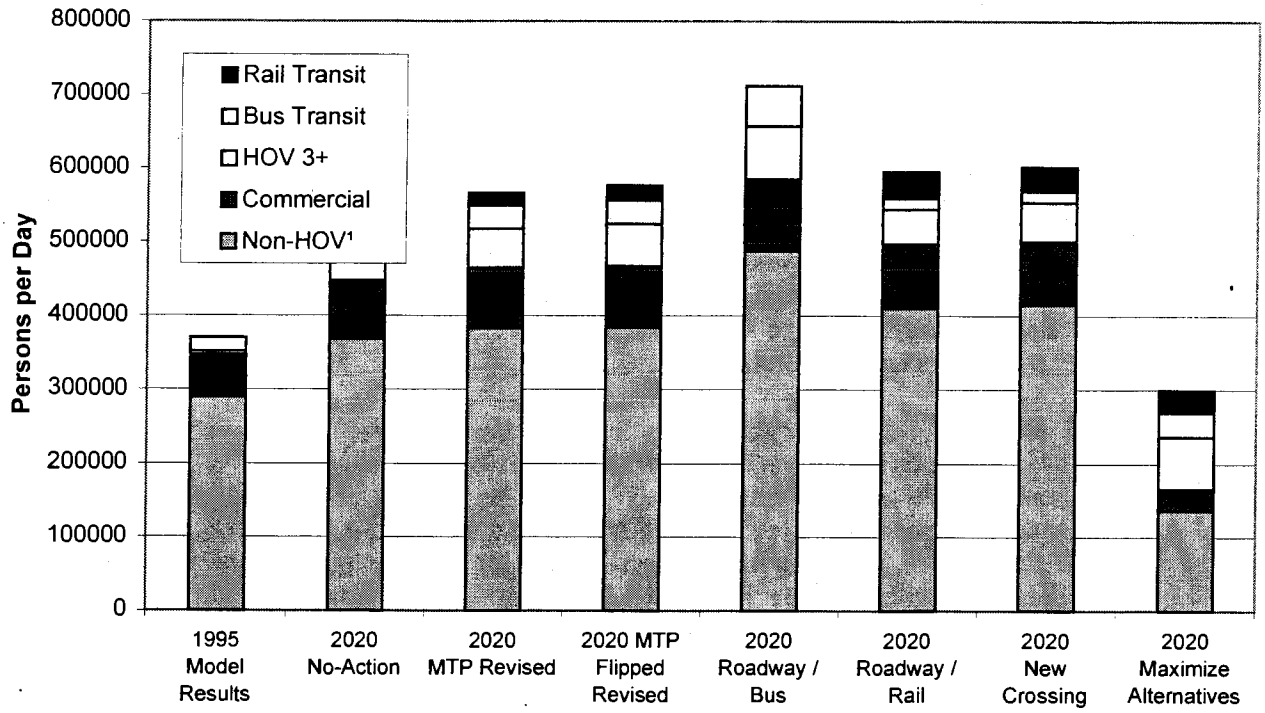
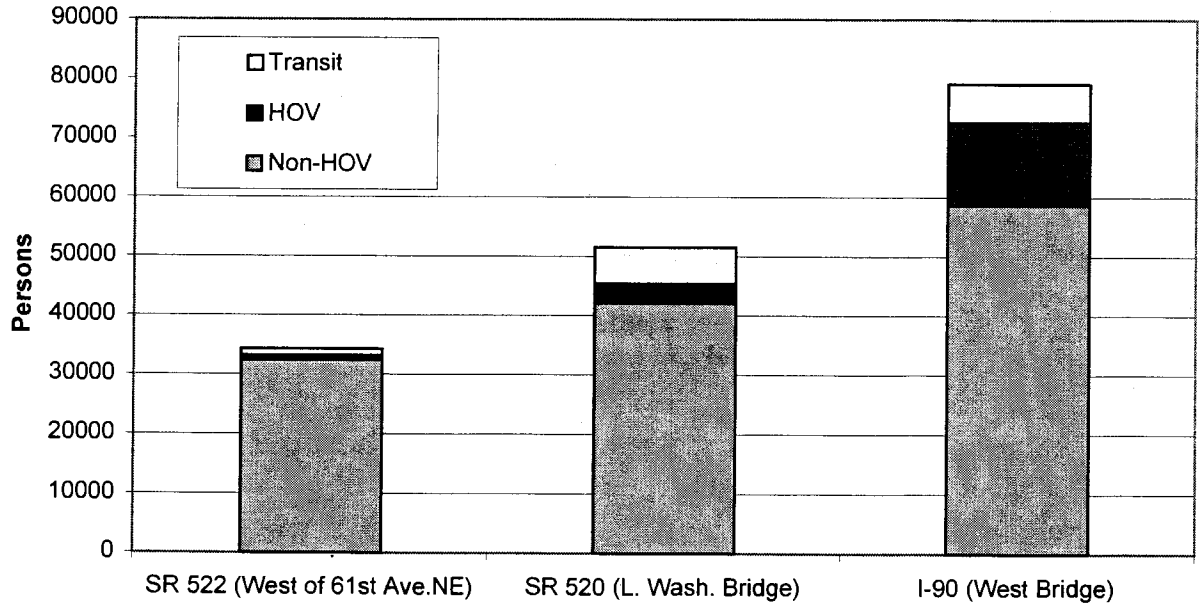


Figure 6-3
No-Action Year 2020 PM Peak Period
Person Throughput and Mode Share



MTP '98 – With MTP '98, overall person trips would increase by 5 percent over No Action. The gains would occur fairly evenly across all modes, including general-purpose, HOV and transit (bus and rail). Total general-purpose, commercial and HOV person trips would increase 4 percent with MTP '98 compared with No Action, and there would be a shift from I-90 to SR 520 because the I-90 center lanes would be used by light rail. MTP '98 would have almost 50,000 daily transit trips, compared to 40,000 in No Action, with half of these trips on SR 520, a third would use I-90, and the remainder would use SR 522. The total daily Trans-Lake mode share percentages remain similar to No Action because improvements in HOV use on SR 520 are offset by a drop in HOV use on I-90. Similarly, transit use is at the same levels as No Action on both SR 520 and I-90; transit users would elect to take rail rather than buses on I-90, but the forecasts showed that transit usage levels would remain similar.

A number of the committee members and other agencies questioned the relatively low forecasts for rail transit. While the regional model's assumptions were directly drawn from earlier regional studies and on 1995 transit service characteristics, they may tend to underestimate the potential future demand for rail or other high capacity systems on I-90 (or on SR 520 or other routes considered in other solution sets.) The forecasts for high capacity transit could be affected by a number of recent developments. These include: changes in local transit networks; projects that would improve bus transit travel times and reliability; faster assumed travel speeds for light rail; rapid growth in some employment centers on the Eastside; and different choices for the light rail routes or terminus (the eastern terminus was assumed to be at Overlake for both MTP '98 and MTP Flipped, and the route is partly at-grade). Figure 6-4 charts MTP '98 results by corridor.

To review the forecast results by corridor:

- SR 522 transit trips would increase by more than 3 times (to 10,100) due to transit lane and transit priority improvements, although HOV trips would decline by 38 percent because SR 520 would be a more attractive alternative route.

- SR 520 HOV person trips would increase nearly three-fold to 44,800 daily HOV person trips, reflecting a shift in HOV vehicle trips from I-90 and SR 522 to SR 520. I-90 HOV person trips would decrease from 36,000 to 6,300 daily HOV person trips. SR 520 transit trips would increase 23 percent due to continuous HOV lanes, while HOV trips would increase by 373 percent, to 44,800.

- I-90 total person trips would drop by 11 percent, if the center roadway is occupied by rail, making I-90 the only corridor in MTP '98 that would decline in total person trips served compared to No Action. I-90 transit trips would shift from bus to rail transit but would remain similar to No Action, and HOV trips would drop by 80 percent.

MTP Flipped – Placing light rail on SR 520, adding HOV lanes, and providing 2-way continuous HOV operations on I-90 would increase total daily Trans-Lake person-trips by 7 percent over No Action 2020. Total Trans-Lake general-purpose person trips would increase 4 percent, although general-purpose person trip percentages for each facility

would remain about the same as No Action. (The exception would be for SR 520, where the model results indicate 24 percent more person trips than No Action as a result of rail and HOV facilities on SR 520.) Trans-Lake HOV person trips would also increase nearly 13 percent with MTP Flipped. Transit ridership would increase 30 percent, although bus transit would decrease by 17 percent as riders select rail, which would account for 36 percent of all Trans-Lake transit trips. Figure 6-5 charts the results by corridor.

The key forecast results by corridor:

- SR 522 HOV person trips would decrease 38 percent, while 522 bus ridership would increase 120 percent due to continuous transit lanes and signal priority treatments. (This effect is nearly identical to the results seen with MTP '98, which has the same treatment for SR 522).

- SR 520 HOV person trips would increase from to 33,800, compared to 12,000 in No Action. SR 520 rail ridership would be 10 percent more than SR 520 bus ridership under No Action, but transit trips on SR 520 are only 10 percent more than MTP '98.

- I-90 HOV person trips would decrease from 36,000 to 21,500 daily HOV person trips, indicating some shift in HOV person trips to SR 520 due to the conversion of the I-90 center lanes to two-way continuous operation. I-90 bus ridership would increase 20 percent.

Roadway/Bus – A system with 8 additional lanes, including four general-purpose lanes and eight total HOV lanes (HOV facilities on four corridors) would increase daily person trips by 32 percent, compared to No Action. Approximately 174,700 daily person trips would result. Trans-Lake general-purpose person trips would increase 31 percent, HOV person trips would increase 42 percent, and transit ridership would increase 40 percent with Roadway/Bus. I-90 total person trips would drop by 17 percent, reflecting increasing demand to the north of the I-90 bridge, while SR 520 and SR 522 would remain similar to No Action. Overall, Trans-Lake transit ridership would increase 40 percent with Roadway/Bus compared with No Action 2020. Figure 6-6 charts the results by corridor.

The key results by corridor:

- SR 522 general-purpose person trips would decrease nearly 20 percent as drivers shift to the New Freeway or choose HOV and transit travel; transit ridership would increase 115 percent on SR 522.

- The New Freeway would attract general-purpose person trips from SR 522, I-90, and SR 520, and it would induce new person trips. Its transit ridership would account for 10 percent of Trans-Lake transit ridership with over 5,000 riders per day, which is comparably low for a Trans-Lake corridor.

Figure 6-4
MTP '98 Year 2020 PM Peak Period
Person Throughput by Facility

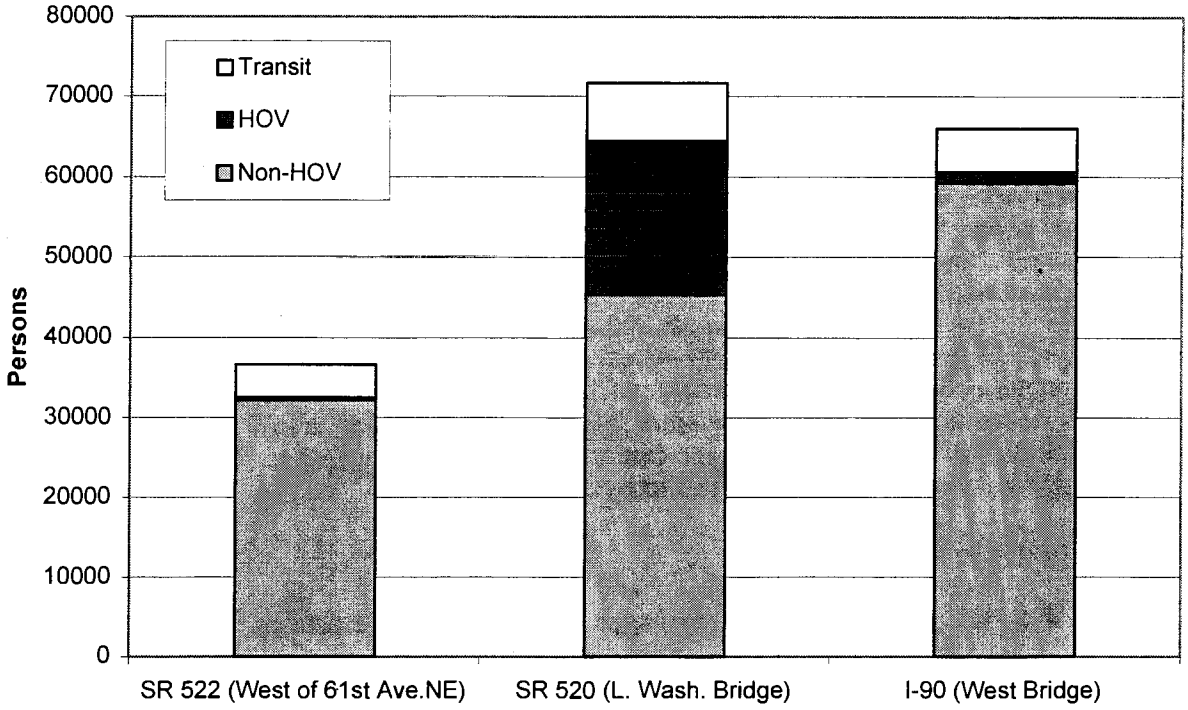
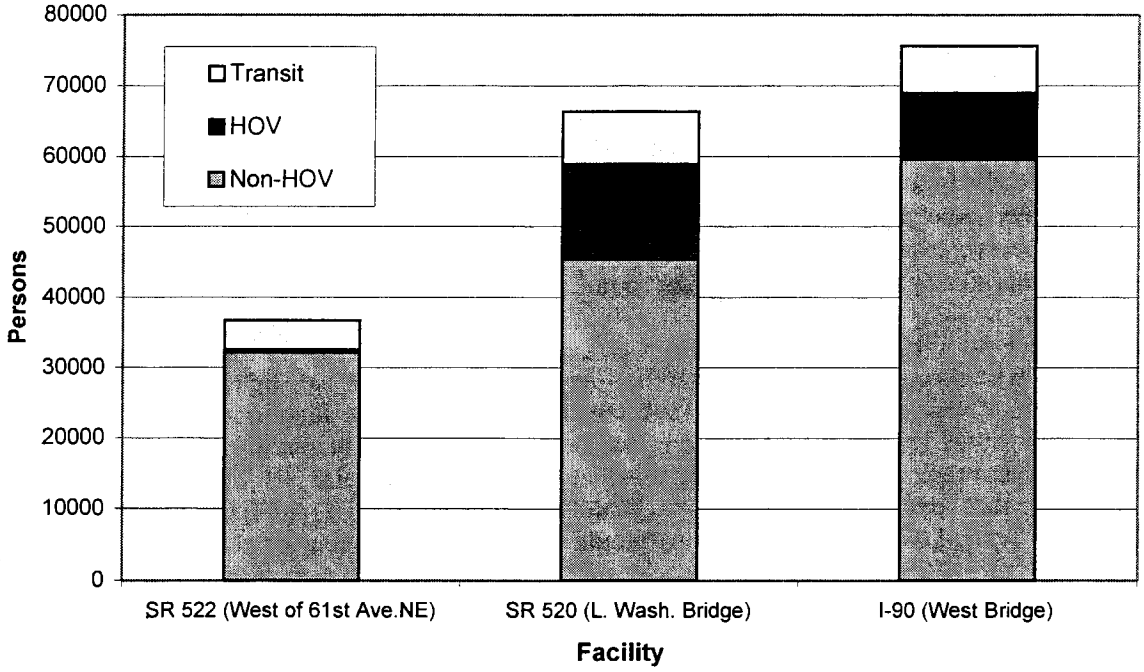


Figure 6-5
MTP Flipped Year 2020 PM Peak Period
Person Throughput and Mode Share by Facility



SR 520 general-purpose person trips would remain about the same with Roadway/Bus as with No Action, but its transit ridership would increase over 20 percent. Its 66 percent gain in HOV travel compared to No Action is lower than other solution sets with HOV lanes on SR 520; while it still reflects strong demand, there are more choices for HOV users in this solution set.

- I-90 general-purpose person trips would decrease nearly 14 percent, while its transit ridership would increase 10 percent. HOV travel would increase 42 percent on I-90 compared to No Action.

Roadway/Rail – This solution set would have an 11 percent increase in total person trips, a relatively modest increase given the scale of investment: two new rail transit lines, new GP lanes on SR 520, but no HOV facilities on either SR 520 and I-90. Total Trans-Lake general-purpose and commercial person trips would increase 11 percent and shift slightly from I-90 and SR 522 to SR 520. HOV person trips would decrease by 8 percent. Overall, transit ridership would increase 28 percent over No Action 2020, with rail ridership accounting for 71 percent of total Trans-Lake transit ridership. At the same time, bus ridership would decrease by more than 60 percent. Overall, transit's share of the Trans-Lake travel market would increase to 9.6 percent, compared to 8.3 percent with No Action. Figure 6-7 charts the results by corridor.

The key results by corridor:

- SR 522 general-purpose person trips would decrease 12 percent, while bus transit ridership would increase nearly threefold to 9,900 riders per day.

- SR 520 general-purpose person trips would increase 40 percent with the added general-purpose lane, with SR 520 carrying 42 percent of total Trans-Lake person trips, compared to 32 percent with No Action. Approximately 18 percent of the corridor's person trips would be via HOV, rail, or bus transit. SR 520 transit ridership would increase 22 percent over No Action, and would carry slightly more transit riders that I-90. HOV person trips would increase on SR 520 because it is the only corridor to provide any advantages to HOV travel, even though it would not have a completed HOV system.

- The I-90 corridor would be used less overall because of the loss of the center roadway to light rail, with results that are similar to other solution sets with the same action. I-90 total trips would decline 9 percent, general-purpose person trips would decrease 3 percent, and transit ridership would increase marginally with a shift from bus to rail.

New Crossing – A 12 percent increase in total person trips (62,000 person trips) would occur with this system, which would feature a new arterial corridor, two light rail lines and new HOV lanes on SR 520. No substantial mode shift was identified for this solution set. Total Trans-Lake general-purpose person trips would increase 12 percent, primarily due to the new arterial crossing between Sand Point Way and NE 124th Street in Kirkland; that route would serve approximately 15 percent of all Trans-Lake person trips. Total Trans-Lake HOV person trips would increase by 6 percent or about 3,000 person trips, with 80 percent of HOV users on SR 520. Total transit person trips would increase by 20 percent reflecting the two rail connections between Seattle and the Eastside. Figure 6-8 charts the results by corridor.

Figure 6-6
Roadway Rail Year 2020 PM Peak Period
Person Throughput and Mode Share by Facility

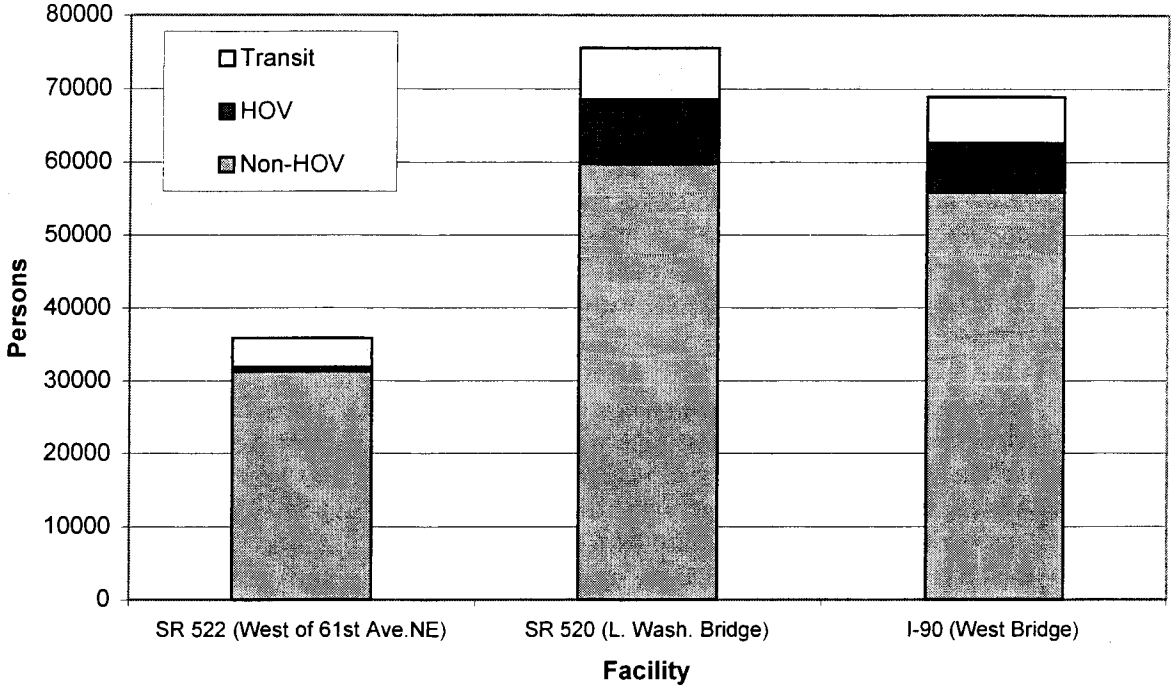
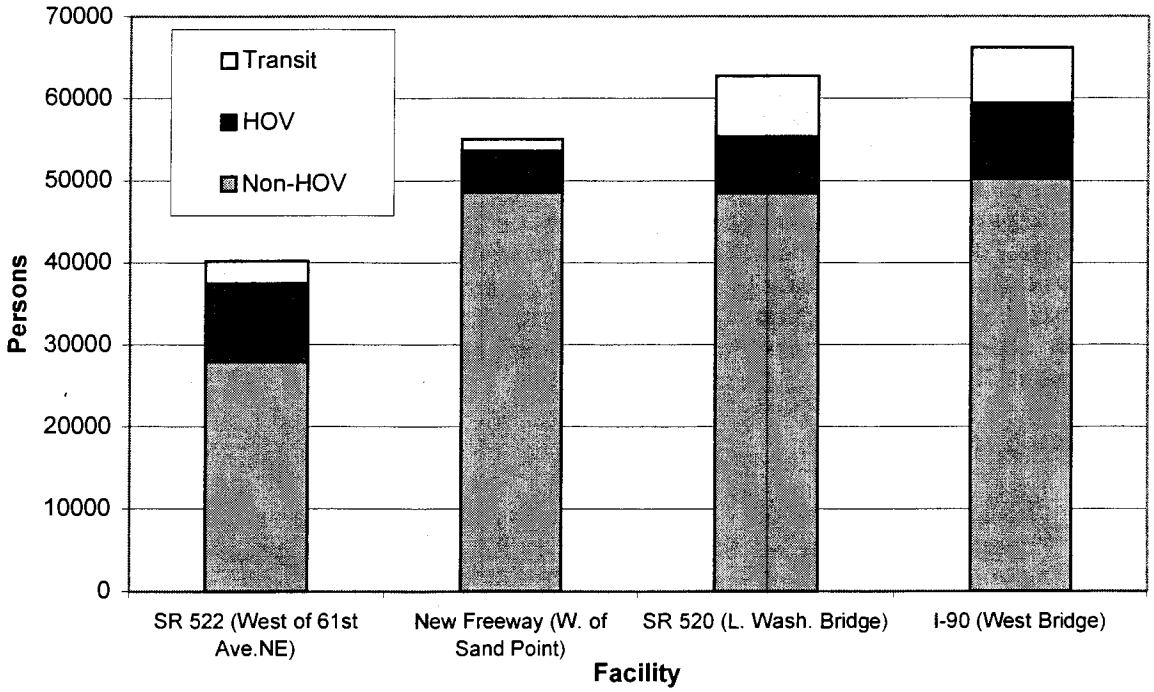


Figure 6-7
Roadway/Bus Year 2020 PM Peak Period
Person Throughput and Mode Share by Facility



To review the results by corridor:

- SR 522 would experience a 10 percent decrease in total trips and a 14 percent decrease in general-purpose trips due to the new bridge. HOV person trips would decrease almost 40 percent, with some HOV person trips diverting to the new arterial bridge and the majority diverting to SR 520. However, bus transit ridership would almost double on SR 522, similar to the increases found in other solution sets.

- The new arterial crossing would carry 87,900 travelers, and would have lower HOV and bus transit mode shares compared to other Trans-Lake corridors, probably due to the limited number of connecting facilities and services. However, 11,300 light rail riders on the new bridge would account for nearly 10 percent of the corridor's total trips, and 35 percent of total Trans-Lake rail transit ridership.

- SR 520 would continue to carry nearly a third of the total Trans-Lake person trips. General-purpose person trips would remain similar to No Action. HOV person trips would increase to 43,200, compared to 12,000 trips under No Action; the increase is largely due to shifts from I-90 and SR 522. SR 520 transit ridership would decrease by 63 percent on SR 520 due to light rail on the other two corridors, and to the modeled effects of local system rerouting.

- The I-90 corridor usage would decrease by over 32,000 person trips per day, and would serve a smaller percentage (37 percent) of total Trans-Lake person trips (compared to 48 percent in No Action). As in other solution sets, the drop is due to light rail service displacing HOV and general-purpose travel in the center lanes. I-90 general-purpose person trips would decrease 3 percent. I-90 HOV person trips would decrease 68 percent (nearly 20,000 person trips). Bus ridership would decrease by 62 percent but rail ridership would more than balance the difference to provide a 10 percent more transit riders than under No Action.

Maximize Alternatives – Daily Trans-Lake person-trips would decrease 44 percent compared to No Action, with 299,700 daily person trips expected. Substantial travel decreases and shifts in trip distribution and mode share would also occur as a result of the general-purpose lane conversions to HOV lanes on SR 520 and congestion pricing on the three Trans-Lake corridors. Total HOV travel would increase by 40 percent, and total transit usage would increase by 58 percent. As the model assumes total system trips as a constant value, the reduction in east/west trips results in an increase in north/south and other arterial trips. This assumption of the model may need to be reevaluated in future studies. Figure 6-9 charts the results by corridor.

The effects by corridor:

- SR 522 total trips would drop 17 percent. Bus transit ridership would increase nearly 3 times over No Action 2020, to 14,500 riders, while general-purpose and commercial travel would drop by 72 and 75 percent, respectively. HOV usage would also drop by 38 percent.

Figure 6-8
New Crossing Year 2020 PM Peak Period
Person Throughput and Mode Share by Facility

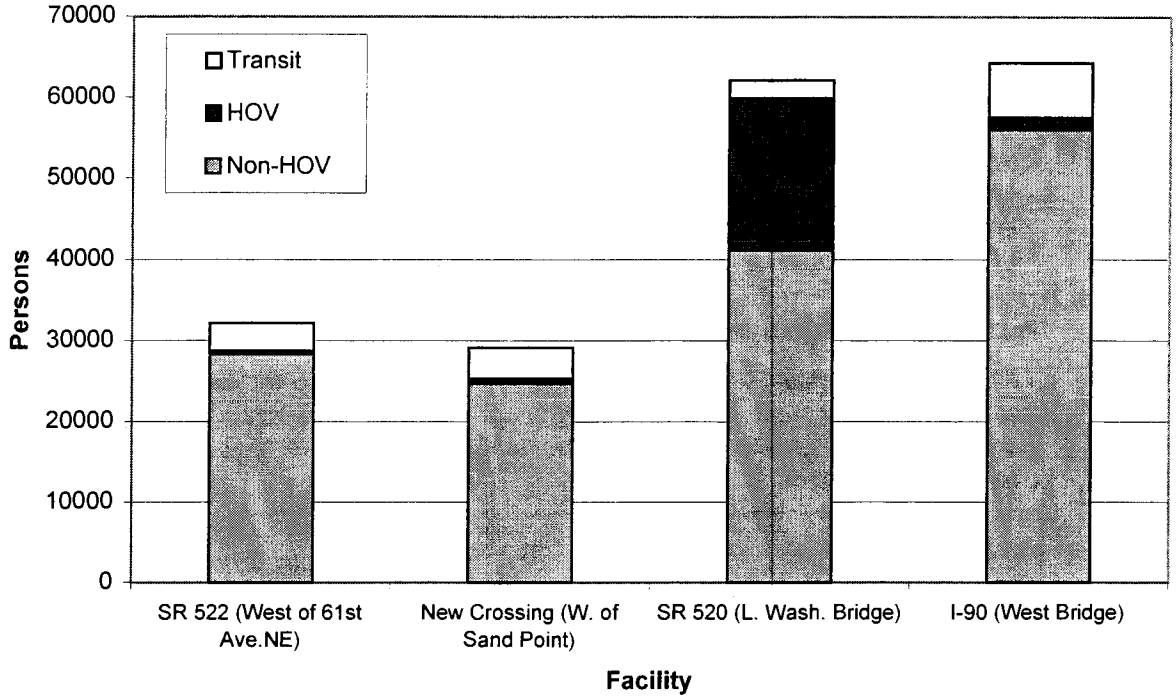
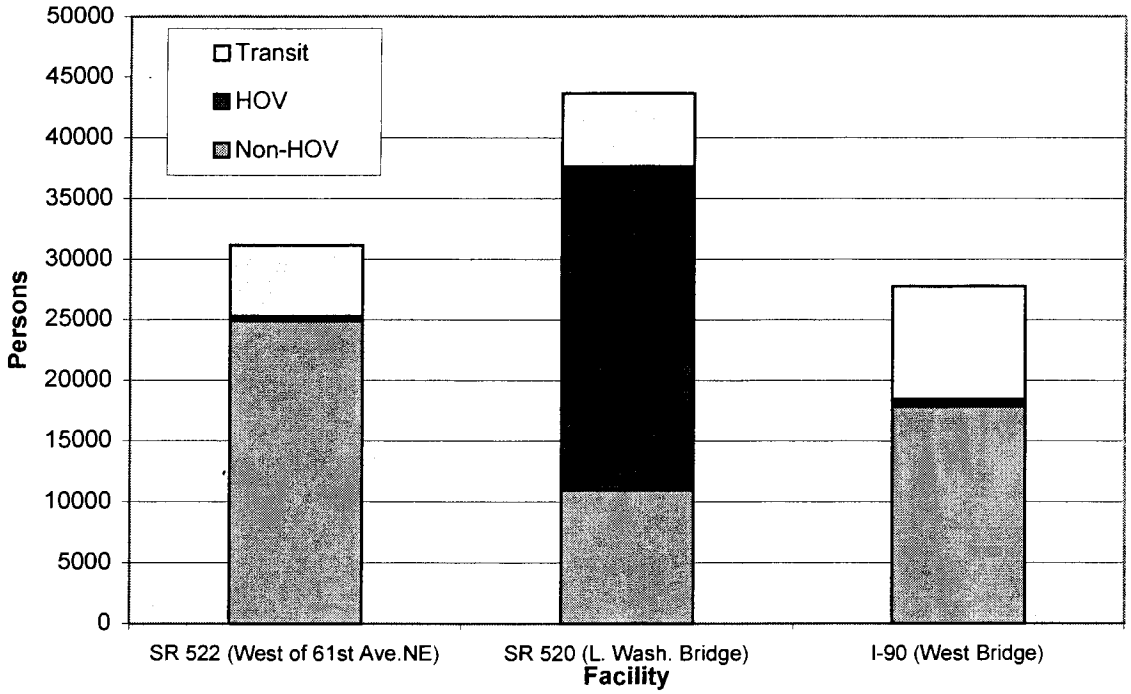


Figure 6-9
Maximize Alternatives Year 2020 PM Peak Period
Person Throughput and Mode Share by Facility



SR 520 total trips would drop 30 percent. However, HOV demand would increase by 465 percent (to 67,800 daily person trips) because the route would offer the only HOV connections for Trans-Lake Travel. The lane conversion would also reduce general-purpose capacity and encourage mode shift, but the high demand for HOV would greatly exceed the capacity of the single HOV lane; actual volumes would be expected to be considerably lower. SR 520 bus it ridership would increase 11 percent over No Action, but would be in the same range as other solution sets.

- I-90 total trips would drop 66 percent. As forecast, bus transit use would completely shift to rail, and I-90's total transit ridership would increase by 52 percent. All Trans-Lake bus service would feed the light rail system, and the rail route used would be faster than in under alternatives.

A Note on Solution Comparison Measures

The summary comparison ratings of solution set performance for each of the transportation measures used the rating scale shown below. Each summary rating is based on qualitative considerations of effectiveness or impacts to the transportation system.

WORST →				BEST
○	◔	◑	◕	●
Least Effective or Most Impacts	Lower Effectiveness, Medium Impacts	Medium Effectiveness and or Low Impacts	Increased Effectiveness or No Impacts	Most Effective or Lowered Impacts

6.3.3 System Compatibility

The system compatibility ratings for the solution sets tended to cluster in the mid-range of the scale, with only a few actions resulting in very high and low marks. Highway ratings were a factor of HOV connectiveness and impacts at receiving facilities where new capacity would be added. For instance, the addition of a large new corridor within the Trans-Lake system was given low marks because other highways in the regional system would be substantially impacted by the additional traffic that a new corridor would attract. Transit ratings were somewhat more difficult to assign because all three existing corridors are already important parts of the regional transit network. On I-90, the addition of rail could result in the loss of HOV lanes to serve bus transit, although it would be compatible with the north/south rail line now being developed. While rail transit would benefit, bus transit would be less convenient. The spreading, web-like nature of the existing Eastside bus route system would not be replaced by a single rail line, and some travelers would need to transfer to rail or face longer delays in their Trans-Lake commutes. The ratings are provided in the table below, and then discussed by alternative in the following paragraphs.

System Compatibility Ratings														
	No Action		MTP '98		MTP-Flipped		Roadway/ Rail		New Crossing		Roadway/ Bus		Maximize Alternatives	
	Hwy	Tra	Hwy	Tra	Hwy	Tra	Hwy	Tra	Hwy	Tra	Hwy	Tra	Hwy	Tra
SR 522	◔	◔	◑	◑	◑	◑	◑	◕	◑	◑	◕	◕	◑	◑
Kirkland-Sand Point Roadways									◑	◑	○	◑◕		
Kirkland-Sand Point Ferries												◑		◕
SR 520	◑	◔	◕	◕	◕	◑○	◑	◔◕	◕	◑	◕	◑	◔	◕
I-90	◑	◔	◔	◔	◕	◔	◔	◑	◔	○◕	◔	◑	◔	◑
Solution Set Summary	◑	◔	◑	◑	◕	◔	◑	◑	◑	◑	◔	◕	◔	◕

Note: Where two bullets are shown, the first reflects bus transit system issues, and the second reflects rail transit system issues.

No Action – The overall solution set received low to moderate scores for both highway and transit system compatibility because it would offer few improvements to existing facilities, including several strategic improvements that are elements of the long range transportation plan for the region. The overall highway system would offer limited capacity for Trans-Lake travel, and missing links would remain in the HOV system on SR 522 and SR 520. The low to moderate scores for both highway and transit were considered the "baseline measure" for comparison to the actions considered in other solution sets.

MTP '98 – In highway system compatibility, the overall solution set would be similar to No Action in terms of cumulative lanes added, so the composite score was unchanged even though individual corridor ratings shifted. The SR 520 score rating improved because a missing link in the regional HOV system would be provided. The I-90 highway score declined to reflect the loss of HOV and bus capacity in the center roadway; this rating also reflects the decline in vehicle and person carrying performance with I-90. In terms of transit system compatibility, the overall score improved by one rank to reflect transit-oriented actions on all three corridors. The improvements by corridor, compared to No Action, included the transit priority and lane improvements on SR 522, the completed HOV lanes on SR 520, and the light rail on I-90. The I-90 transit rating remained the same as No Action, however, because the improvement was perceived to have both positive and negative effects at the regional level. While a light rail line on I-90 would complement other regional light rail investments, it would displace existing bus services, many of which would otherwise provide direct service to riders who would not be directly served by the light rail route.

MTP Flipped – The overall ratings for roadway are improved compared to No Action and MTP '98, while the transit rating was the same as No Action due to changes that would have both positive and negative effects. SR 522 ratings would be the same as MTP '98. SR 520 also had the same rating as MTP '98 because it would complete the HOV system. I-90 has an improved highway rating because the center roadway would remain available to HOV use and an important Trans-Lake link would not be eliminated. In terms of transit ratings, SR 520 itself has a ◑ rating, the same as MTP '98, because transit would be benefited by the HOV lanes. However, a light rail line on SR 520 was given the lowest rating because information from Sound Transit indicated that a rail line connecting to the Central Link north of downtown would reduce long term capacity for the system. Similarly, I-90 had the same rating (◔)as No Action because I-90 has been

the regionally assumed route for light rail; the score remained mixed, however, because two way bus operations could be provided in the center roadway under this alternative.

Roadway/Rail – The overall scores for this alternative were moderate for both highway and transit components. SR 522 included several additional improvements targeted at transit and HOV use, improving its transit rating by one point. SR 520 added general-purpose lanes that would connect directly to the Mercer area, reducing Mercer weave issues. However, the absence of HOV lanes on SR 520 would leave a missing link in the regional system, providing a highway rating that was the same as No Action, and lower than solutions that proposed HOV lanes. SR 520 had mixed ratings for transit; the loss of HOV lanes would make bus transit travel more difficult, but the rail system would provide a cross-lake connection without impacting the long-term capacity of the Central Link line. I-90's highway and transit ratings are the same as MTP '98, which would also replace the center roadway with rail.

Roadway/Bus – This solution set had a lower score for highway compatibility overall because the high volume of traffic attracted by added capacity on a new freeway and an expanded SR 520 could not be effectively served by I-5 and I-405. Its transit score was substantially improved compared to No Action, because HOV lanes would be provided on several roadways; however, an all-highway system would not be consistent with long range plans that call for high capacity transit. On SR 522, the combined HOV and grade-separation improvements would improve traffic flow and transit travel times, resulting in higher ratings than No Action. The New Freeway received a low score for highway compatibility because they would attract more general-purpose travel, and extensive queues would be predicted at connections to and from I-5 and I-405. However, the transit rating for the new freeway was ◕, or a 4 out of 5, largely because HOV lanes would be provided that would connect to other regional HOV facilities. SR 520's highway rating was ●,the highest mark, because both HOV and general-purpose lanes would be added, and several existing bottlenecks or congestion points would be addressed by new connections to express lanes and local arterials in Seattle. SR 520's transit rating was moderate but improved from No Action, reflecting the benefit of added HOV lanes. On I-90, committee information showed a ◔ rating for highway compatibility; however, this appeared to be an editing error in their materials. The I-90 highway rating should have been ◕, the same as with MTP Flipped, because the center roadway would be converted to two-way operation and would not be reserved for rail use. However, the transit rating of ◑, which is one point higher than other alternatives without rail on I-90, reflected the benefits of two-way operation for an all-bus network.

New Crossing – The overall ratings for New Crossing were moderate, similar to MTP '98; aside from the second light rail line and the arterial roadway, the system would be the same as MTP '98. The new crossing was given moderate ratings for highway and it system compatibility; it was not considered to carry sufficient traffic to benefit or impact the regional system (local traffic impacts were considered in a separate environmental measure). The major change in the ranking for New Crossing occurred with I-90, where the bus transit and rail transit scores were split; the loss of the center roadway would impact bus transit, but the new rail line would be compatible with the regional high capacity system.

Maximize Alternatives – Reduced capacity on two existing highways resulted in an overall highway rating that was lower than No Action. New rail transit and the emphasis on HOV provided a higher rating for transit overall. SR 522 ratings are unchanged from other solution sets. SR 520 was given a lower rating for highway compatibility because the loss of general-purpose lanes was predicted to have a substantial impact to I-5 and I-405. In terms of transit, the conversion to HOV was ranked one point higher than No Action, the same as other alternatives that completed a missing HOV link on SR 520. The highway ratings for I-90 were the same as other sets that reserved the center roadway for light rail. Transit ratings for I-90 were similar to other sets with rail on I-90.

6.3.4 Travel Times

Committee members were provided with point to point comparisons of travel times, based on trips made between major activity centers on either side of the lake. Year 1995 conditions for general-purpose and HOV travel between these points were provided for comparison to year 2020 conditions. The HOV and general-purpose travel time calculations were direct model results, and were provided to the committee members without additional ratings. A weighted average travel time was also provided, but again was not characterized in presentations as a major distinguishing factor between solution sets because of the range of other factors that were inherent, including model-predicted changes in trip length and highway travel speeds. The rail transit travel times (for in-vehicle travel only) that were assumed for model forecasts were also provided.

The travel time results are included in Appendix 4. As the travel time information was a composite of system level effects, the results were not corridor-specific. However, taken with other model results, they did provide more information to the committee about the mode choice decisions that were being made. For instance, HOV mode share tended to increase as HOV travel time advantages grew, and declined if HOV facilities were removed.

6.3.5 Safety

Safety ratings were assigned overall to the solution sets, as well as to each of the individual components. The ratings, which are shown in summary Table 5-1b, were calculated using a formula approach that considered a variety of geometric, operational and incident recovery factors. However, the ratings were found to be generally similar between solution sets or corridor actions, and did not tend to differentiate the various solution sets at regional or corridor levels. Any improvements to the highway corridors were generally assumed to be built to current design standards, and previously existing safety issues would likely be improved. The rail corridors were also given similar ratings, with a one-point difference between fully grade-separated corridors, and those with in-street operations. Although the grade-separated routes would have less potential for safety conflicts than routes that operated in streets, more than half of all the routes would still be in separate rights-of-way.

6.3.6 Reliability

The reliability ratings were assigned overall and by corridor, and included separate ratings for general-purpose, 3+ HOV, bus and rail travel. The separate measures for each mode were requested by committee members to allow them to consider the relative

modal benefits that would be provided by different combinations of actions. The full set of ratings are provided in summary Table 5-1b.

At the corridor level, the model-reported volume-to-capacity level for general-purpose traffic provided a general indication of the likely severity of congestion that would occur on the corridor; congestion and the likelihood of bottlenecks were considered major factors in determining reliability. At system connection points and along other transit routes, additional analysis was performed to identify areas where bottlenecks or queuing would likely occur. The ratings in general resulted in consistent ratings according to mode. General-purpose travel was expected to be unreliable in nearly all solution sets, and had low to moderate ratings. HOV and bus reliability ratings were moderate in most cases, and differed only when no improvements were provided or (as in SR 522) were provided for transit only. Rail reliability ratings were consistently high, with the highest ratings given to routes that had their own right-of-way. The results by solution set are reviewed below:

No Action – At the system level, which would generally be operating with high levels of congestion for long periods of time, reliability was poor for all general-purpose facilities, and fair for HOV and bus modes, which would have some benefit from existing facilities. General-purpose travel reliability would be poor in all corridors. SR 522 would have slight benefits to bus transit, based on the portions of the corridor that would have transit lanes. On SR 520, HOV and bus travel reliability would be low, because of the lack of continuous HOV lanes, the high degree of congestion, and the lack of shoulders or refuges. The center lanes on I-90 would continue to offer travel time benefits to HOV and bus travelers, but in one direction only, so it was given a moderate rating.

MTP '98 – Overall, reliability would slightly improve with MTP '98, compared to No Action. General traffic in MTP '98 would also face high levels of congestion, and the scores were either low or moderately low in all corridors. Bus reliability would improve to moderate on SR 522, although congestion could still delay operations. Reliability was improved to moderate for HOV and bus on SR 520, from the addition of HOV lanes. HOV and bus reliability dropped to low on I-90 because of the loss of the center roadway to light rail. Light rail on I-90 had a moderately high reliability rating, with a slight potential for delay due to the portions of the route that would operate on arterial streets.

MTP Flipped – General-purpose reliability for MTP Flipped was the same as MTP '98 for general-purpose traffic on SR 522, SR 520 and I-90, because similar conditions and facility characteristics would be involved. On SR 520, the HOV lanes on SR 520 would offer moderate reliability for HOV and bus, although the corridor would still be congested. Rail on the SR 520 corridor would have moderately high reliability, the same rating assigned to light rail in MTP '98. On I-90, bus and HOV reliability would improve to moderately high because HOV facilities would be available in both directions all day.

Roadway/Bus – Reliability ratings in this solution set were primarily affected by the traffic increases forecasts for the New Freeway, and by the provision of HOV lanes for all corridors. Overall, general-purpose reliability was predicted to be moderately low. The substantial increases in Trans-Lake vehicle trips would be most notable near the New Freeway, where travel volumes would create longer queues approaching and on I-5 and I-405. At the same time, the ratings for general-purpose travel would slightly

improve on I-90 and SR 520 because some traffic would be diverted to the New Freeway. All the corridors featured HOV lanes, which resulted in moderate reliability ratings for bus and HOV travel.

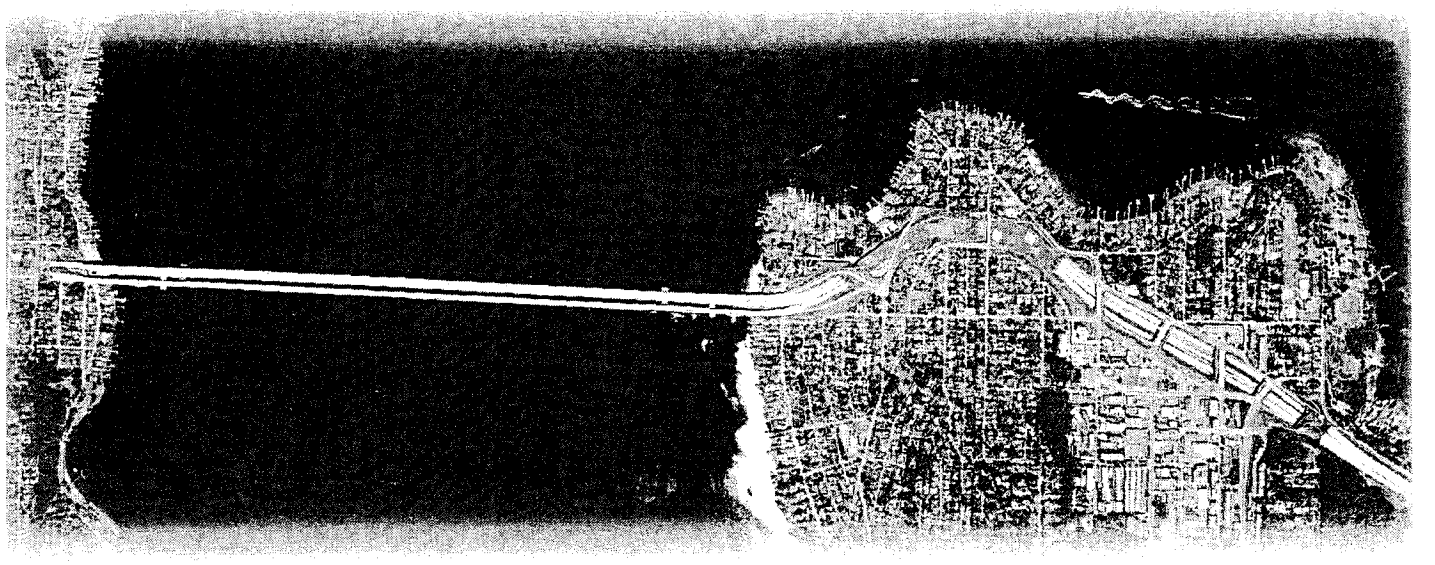
Roadway/Rail – Overall and individual corridor reliability ratings for general-purpose travel were the same or slightly improved compared to No Action. The general-purpose increases would be limited to SR 520, where volume-to-capacity ratios were shown to be extremely high; the moderately low rating for general-purpose travel indicates a high potential for unstable operations, even with the expanded capacity. HOV and bus transit on SR 520 also had a moderately low rating because they would also use general-purpose lanes across the lake. The same results were found for general-purpose, HOV and bus travel on I-90, where the center roadway would be converted to light rail use. Both rail routes were given a moderately high rating.

New Crossing – Results for this solution set were similar to those provided for MTP '98, which had a similar system configuration except for the new arterial. To focus on the ratings for the new arterial, moderately low reliability was predicted for general-purpose, HOV and bus modes because the arterial would not connect to regional facilities, and additional travel on local streets would be required to reach major destinations. Rail on the new arterial route received a moderately high rating. SR 520 ratings and I-90 ratings were the same as other solutions with the same actions.

Maximize Alternatives – The demand management and mode shift measures that were provided in Maximize Alternatives resulted in a marked decrease in person trips, and as a result would reduce congestion and improve reliability on all of the corridors. On SR 522, all modes would operate with moderate reliability. On SR 520, HOV and Bus users would have high reliability, and general-purpose travelers would have moderately high reliability. On I-90, bus, HOV and general-purpose vehicles would share the same lanes because the center lanes would be occupied by rail; they all had the same moderately high rating, largely because travel volumes would be low. The two rail routes considered, both of which would be fully grade-separated (operating in their own rights-of-way with no potential for conflict) had high reliability.

Trans-Lake Washington Study

7. Environmental Methods & Findings, Mitigation Approach



7. Environmental Methods and Findings, and Mitigation Approach

For each solution set, the impacts were estimated in each segment of the four corridors. The segment-based evaluation results are illustrated in Appendix 6. Then impacts in each corridor were assessed as a whole, and the solution set was given a rating for each of 10 environmental impacts. The rating were then translated into a shaded circle system, with ○ representing "1" or the highest impacts, and ● representing "5" or the lowest level of impacts. (In some cases, ● also represents an improvement over the baseline conditions.) This section presents the outcome of the corridor-based summary, and a description of the major evaluation considerations for each corridor.

The analysis of the environmental effects were based on conceptual design details that had been developed by the project staff. The committee was advised that the details were for the purpose of evaluation only, and that they were likely to change with further study. The conceptual designs incorporated impact avoidance and mitigation approaches wherever possible, based on earlier reviews of sensitive resources in the project corridors. For instance, all of the new corridors for highways, arterials, and rail were chosen based on initial reviews of potential corridors and impacts. Tunnel routes were chosen for both of the new roadway concepts (a new freeway and new arterial) after earlier reviews concluded that displacement impacts and other effects of a surface route would be so substantial that they could not be reasonably considered. However, as committee members were advised, more detailed design information would be needed to approach the level of analysis required for EIS-level reviews.

Cut-through traffic and congestion from Trans-Lake travel is a major concern for local neighborhoods.

7.1 Built Environment

7.1.1 Arterial Traffic

The rating for arterial traffic takes into account several issues. In certain locations, such as 84th Avenue NE in Medina and Montlake Boulevard in the Montlake neighborhood, there is already a significant queue for traffic accessing SR 520. If traffic congestion on SR 520 worsens, there would be a greater incentive for drivers to access SR 520 at these locations, as opposed to at a location closer to their origin. Secondly, if the congestion on a mainline freeway gets to be significant enough, traffic may exit the freeway and use parallel arterial roadways as alternate routes. Thirdly, and this is most applicable in the case of the Maximize Alternatives solution set, if the price for using the freeway is high enough, it is likely that traffic that formerly was on the freeway would use the arterial network as an alternative, resulting in greater levels of arterial congestion throughout the network.

Arterial Traffic Impacts Summary							
	No Action	MTP '98	MTP-Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◑	◔	◔	◔	◑	◑	◔
Kirkland-Sand Point Roadways					○	◔	
Kirkland-Sand Point Ferries						◔	◑
SR 520	◑	◔	◔	○	◑	◑	◑
Rail		◑	◑	◑	◔		◑
I-90	◑	◑	◑	◑	◔	◕	◑
Solution Set Summary	◑	◑	◑	◑	◑	◕	◑

Arterial Traffic Impacts by Corridor

As an arterial facility itself, the effects of more traffic on SR 522 would be realized in delay and queuing at side streets and signalized intersections. In the Roadway/Bus solution set, an HOV lane is brought onto a mixed-development street (NE 145th Street).

There were two separate crossings proposed in the Kirkland-Sand Point corridor. In the New Crossing solution set, there are two major points at which arterial traffic would be at issue. At the Sand Point terminus of the bridge, all of the traffic on the bridge—nearly 60,000 vehicles per day—would have to either come from or go to Sand Point Way. At the eastern end of the corridor, the same volume of traffic that would be added to Sand Point Way would be added to NE 124th Street in Kirkland. In this instance, all of the traffic would use at least some portion of NE 124th Street. In Seattle, traffic would be dispersed between northbound and southbound Sand Point Way. The Roadway/Bus solution set follows a similar pattern. The primary arterial traffic impacts would be at Sand Point Way in Seattle and in Kirkland. In this case, Sand Point Way is not the terminus (I-5 is the westernmost interchange), and the design of the interchange would limit access to those trips to and from the south. In Kirkland, the new corridor interchange with I-405 was assumed to be near the existing NE 85th Street interchange, but without access from NE 85th Street. The arterial traffic impacts in this case stem from trips in Kirkland redistributing from the NE 85th Street interchange to the adjacent interchanges (via city streets) to access the new corridor.

In the SR 520 corridor, increases in the mainline traffic volumes would have a parallel impact on the critical arterial cut-through and ramp queue interchanges (e.g., Montlake and 84th Avenue NE). Three of the solutions had very similar results. The MTP '98, MTP Flipped, and New Crossing solution set modifications to the SR 520 corridor would not bring a higher level of arterial traffic than under the no-build configuration. The Roadway/Rail solution set has several features that would help arterial traffic. There is new access provided to Eastlake. This would take some traffic off Mercer Street, moving it several blocks to the north on Eastlake. The new interchange at SR 520 and Pacific Avenue would relieve some of the traffic on the Montlake Bridge. Working against this alternative are the increased volumes that accompany the added general-purpose lane. Because of the tolls imposed for Trans-Lake Washington travel under the Maximize Alternatives solution set, traffic volumes on the Evergreen Point Floating Bridge were significantly lower than for any other solution set. More trips stayed on the side of Lake Washington on which they started, meaning that the traffic volumes would increase locally while the Trans-Lake volumes decreased.

Ratings of arterial traffic around the I-90 primarily reflect increased volumes. In addition, more queuing is expected at the general-purpose ramps under alternatives that convert the center roadway to rail. The HOV trips would use the general-purpose ramps and become part of and extend the queues at these ramps.

7.1.2 Noise

The ratings for noise effect are based on an estimation of the impact to sensitive receptors around the transportation facilities in each solution set. To some degree, these will parallel the arterial traffic impacts, as an increase in traffic will generally indicate an increase in noise.

Noise Impacts Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◑	◑	◑	◔	◑	◑	◑
Kirkland-Sand Point Roadways					◔	◔	
Kirkland-Sand Point Ferries						◑	◑
SR 520	◑	◔	◔	○	◔	○	◑
Rail		◑	◑	◑	◑		◑
I-90	◑	◑	◕	◑		◕	◑
Solution Set Summary	◑	◑	◑	◑	◑	◑	◑

Noise Impacts by Corridor

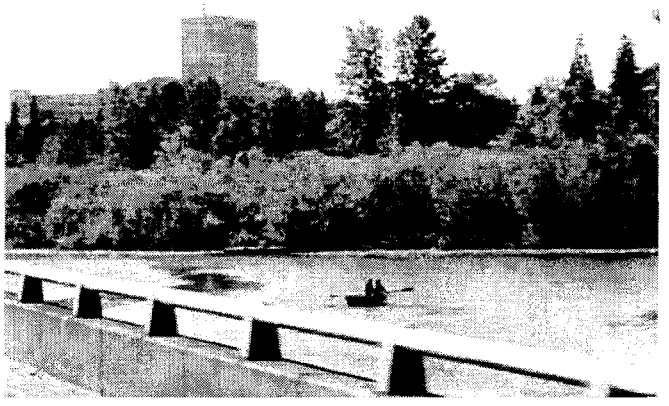
Most of the concepts do not differ greatly in terms of the traffic they put on SR 522, and therefore in terms of the noise in the corridor. Roadway/Rail was rated slightly worse than the other alternatives because of the addition of an HOV lane in each direction that would increase the footprint of SR 522 and put the roadway closer to sensitive receptors in the corridor.

In addition to residences along SR 522 and SR 523, sensitive noise receptors in the corridor include:

- Jackson Park Golf Course
- Paramount Park
- Burke Gilman/Sammamish River Trail System
- Tracy Owen Station Park
- Swamp Creek Park
- Tolt Pipeline Trail
- Blyth Park

Both of the new bridge concepts in the Kirkland-Sand Point Corridor scored poorly for noise on two counts. First, the New Crossing solution set would significantly increase traffic on an arterial street in Kirkland. Second, and perhaps more importantly, the third bridge would bring highway noise into a part of the Lake that currently does not have any.

The noise evaluation for SR 520, already close to residences in several locations in the corridor, ranged from moderate to high impacts. The worst rating for noise was given to the Roadway/Rail and Roadway/Bus solution sets, which have a larger roadway footprint that puts it closer to sensitive receptors and an increase in traffic that increases the level of noise reaching those receptors. The best rating for noise (moderate) was given to No Action and Maximize Alternatives, which keep the existing configuration of SR 520. Adding one lane in each direction, which occurs in four solution sets, was given a score between moderate and worst.



Many environmental factors clearly come into play in some areas. Here, the SR 520 roadway's use is related to parks, recreation, views, water quality, endangered species, sensitive areas and noise.

SR 520 is close to residences in Roanoke, Montlake, and through the Points communities. In addition, the following sensitive receptors are near the corridor:

- Roanoke Park
- Interlaken Park
- Montlake Park
- Washington Park Arboretum
- Three Points School
- Fairweather Park
- Hunts Point Park
- Yarrow Bay Wetlands Park
- Sammamish River Trail
- Westside Park
- Marymoor Park
- Wetherill Nature Preserve

Much of the I-90 corridor has noise mitigation features in place through the City of Seattle and Mercer Island. As a result, the I-90 corridor generally has lower noise impacts than other corridors. Most of the noise impacts were associated with the addition of light rail to the corridor, with impacts generally most acute in the vicinity of Mercer Slough Park.

7.1.3 Displacements

Displacements are a measure of the number of structures that would have to be removed for each solution set. For purposes of this study, a displacement is a building; this level of analysis does not distinguish between a commercial building, an apartment building, and a single-family home. Displacements were tallied by segment within each corridor. The totals for each corridor appear below.

A structure was counted as a displacement in either of two cases. Most often, a structure lay within the proposed right-of-way. In rarer instances, the access to the structure (or parking area, in the event the building was clearly of a commercial nature) was restricted or cut off entirely.

Summary – Estimated Displacements							
	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	0	30-35	30-35	135-145	30-35	215-235	30-35
Kirkland-Sand Point Roadways					35-50	90-110	
Kirkland-Sand Point Ferries						1-10	1-10
SR 520	0	20-40	50-70	60-95	50-70	20-40	0
Rail	0	1-10	10-20	20-40	50-70	0	1-10
I-90	0	0	0	0	0	0	0
Solution Set Summary	0	50-75	80-105	195-240	115-155	325-385	30-35

For each segment, the number of displacements was rated on the following scale:

0	No Impact	◕
1-10	Low	◑
10-50	Medium	◔
50+	High	○

Totaling the impacts on each corridor, based on the severity of impacts in each segment, resulting in the following rankings.

Summary – Impact							
	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◕	◑	◑	○	◑	○	◑
Kirkland-Sand Point Roadways					◔	○	
Kirkland-Sand Point Ferries						◑	◑
SR 520	◕	◑	◔	◔	◔	◔	◕
Rail		◕	◑	◔	◔		◑
I-90	◕	◕	◕	◕		◕	◕
Solution Set Summary	◕	◑	◑	◔	◔	◔	◑

7.1.4 GMA Plan Analysis

The GMA of 1990 requires that municipalities establish comprehensive plans designed to focus urban growth within designated UGAs. The conceptual designs and operational details for each of the four major corridors were evaluated in terms of compatibility with the land use and transportation elements of the comprehensive plans of applicable municipalities. Proposed improvements in the corridors were analyzed in terms of their level of compatibility with the growth plans developed by the applicable entities.

Ratings ranged from ○ for total incompatibility to ◕ for completely compatible. A rating of ● represents a solution set whose elements enhance GMA objectives to a level beyond what is established in the local comprehensive plans.

GMA Plan Analysis Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◑	◕	◕	◑	◕	◔	◕
Kirkland-Sand Point Roadways					◑	○	
Kirkland-Sand Point Ferries						◕	◕
SR 520	◑	●	◑	◑	●	◑	◑
Rail		●	●	◕	◑		◕
I-90	◑	◕	◕	◕		◕	◕
Solution Set Summary	◑	●	◕	◑	◕	◑	◕

In general, few of the comprehensive plans made direct references to improving the corridors under study. Instead, they focused on increasing opportunities for alternative forms of transportation and protecting existing neighborhoods. Larger municipalities, such as Seattle and Bellevue, were concerned with establishing mass transit to their downtown cores and urban villages. They wanted a balanced system with several options that respected existing land uses. Regardless of the size of the city, a common theme was ensuring the availability of alternatives to the SOV without disrupting neighborhoods.

The stated emphasis on shifting away from SOV transportation means that overall, the No Action alternatives in each of the corridor sections would result in a low degree of compatibility with the comprehensive plans. The intent of the goals and policies within the comprehensive plans are to elicit and direct action toward achieving those goals; taking no action would be considered a practice incompatible with those goals. It can be further assumed that without action, transportation conditions in all of the corridors will continue to worsen, affecting the quality of life in neighborhoods region-wide. This would be in direct conflict with land use policies striving to preserve the character of their communities.

Road, bus and/or light rail improvements that are compatible with a local comprehensive plan are rated as Improvement. Degrees of incompatibility with a local comprehensive plan are rated as low, medium, or high, with high as the most incompatible.

GMA Plan Analysis by Corridor

The SR 522/523 corridor generally contained design details that would be improvements under the GMA plans of Seattle, Shoreline, Lake Forest Park, Kenmore, and Bothell; however, some segments have elements that have a low or moderate level of compatibility with these plans. Regional bus/transit improvements and incorporation of HOV lanes on SR 522 would be compatible for all jurisdictions. In the Lake Forest Park segment, offsetting goals in the GMA plan result in some incompatibility between some solution sets and the plan. Although Lake Forest Park would like to minimize congestion and travel time on arterials for transit and HOVs, they discourage roadway capacity expansion and roadway widening. Therefore, MTP '98, MTP Flipped, New Crossing,

and Maximize Alternatives were evaluated as "Low" in this segment. Additionally, displacements caused by road widening and intersection improvements in the Roadway/Bus and Roadway/Rail alternatives would not be completely consistent with established plans.

Conceptual design details proposed in the SR 520 corridor would result in medium-to-high levels of consistency, along with some areas of improvement. Areas of high compatibility would tend to occur in the western segments of SR 520 within Seattle city limits where new light rail lines could be inconsistent with residential neighborhoods, and in solution sets where general-purpose lanes have been proposed for SR 520. These incompatibilities would be partially offset by compatible concepts such as bus and HOV improvements. Eastside jurisdictions such as Hunts Point, Yarrow Point, Bellevue, Kirkland, and Redmond would find the SR 520 design concepts an improvement according to their comprehensive plans. However, Medina and Clyde Hill would face several displacements, resulting in only moderate consistency. Both the Bellevue and Redmond downtown areas would be served by new light rail service as well, in accordance with their plans.

The Kirkland-Sand Point corridor has two solution sets occurring in the same general vicinity. The Roadway/Bus corridor would result in medium to high levels of incompatibility. Segments of this corridor within the City of Seattle would not be consistent with the Seattle comprehensive plan, mainly because of the presence of a new freeway. The location of the proposed freeway within a residential neighborhood worsens its impact around the portals and interchange area; tunneling would help to avoid further displacements. A bus and passenger only ferry would be compatible. Consistency with the Kirkland plan would be in the medium range; policies do not specifically prohibit a new freeway, but they indirectly imply that alternative transportation is preferred. Converting NE 124th Street into a limited access highway would also negatively affect existing land uses along this street.

The New Crossing corridor from Kirkland to Sand Point would result in low to medium conflicts. The greatest level of incompatibility for this alternative would occur in the same segments as in the Roadway/Bus corridor; however, they are less severe because an arterial is proposed instead of a freeway. Creating new street space in Seattle would be discouraged, but the transit options would help to mitigate that down to a "low" level of conflict. A new arterial in Kirkland would also be discouraged, but again, providing light rail would help to reduce the conflict. A new arterial in the segment from 93rd Avenue NE to I-405 may be out of character with existing land uses and result in "medium" conflicts.

Improvements in the I-90 corridor would be characterized by a low degree of conflict or by improvements. Similar to the effects along the SR 520 corridor, western segments would have a higher degree of consistency with growth plans, while further east the design concepts would generally result in improvements. Low levels of conflict would occur in solution sets that propose light rail in place of the existing HOV lanes on I-90. Seattle's comprehensive plan stresses a balanced system; therefore, replacing one form of alternative transportation with another could not be considered an improvement. Some incompatibility would also occur on Mercer Island if no light rail is built there, as proposed in the MTP Flipped and Roadway/Bus solution sets. Mercer Island's comprehensive plan emphasizes having light rail serve the downtown core, linking it to other urban centers. Segments near Beaux Arts and through Bellevue would be viewed

as improvements in all solution sets, as the diverse design concepts would serve all of the appropriate urban areas with little disruption to residential areas. However, a light rail line to Issaquah would be somewhat inconsistent; that type of mass transit would likely be out of scale with the amount of growth Issaquah envisions through its comprehensive plan.

7.1.5 Physical Barriers

This is a qualitative measure of the degree to which new transportation projects would split or restrict access within an existing neighborhood more than has already occurred (such as in Montlake). Although mitigation efforts are not factored into this evaluation, the integration of certain types of noise mitigation and neighborhood improvement structures (e.g., freeway lids) would result in an improvement in the degree to which neighborhoods are reconnected (e.g., by providing a green connector over a freeway where there is now freeway pavement).

Physical Barrier Impacts Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◕	◕	◕	◕	◕	◔	◕
Kirkland-Sand Point Roadways					◔	◔	
Kirkland-Sand Point Ferries						◕	◕
SR 520	◕	◕	◕	◕	◕	◕	◕
Rail		◑	◕	◑	◑		◑
I-90	◕	◕	◕	◕		◕	◕
Solution Set Summary	◕	◕	◕	◑	◑	◑	◕

Physical Barrier Impacts by Corridor

The types of improvement proposed for SR 522 generally did not change the degree to which the roadway would disrupt neighborhoods. As an arterial roadway with signalized and unsignalized intersections, there is already a high degree of connectivity between the two sides of the roadway. However, one of the lowest corridor rankings was given to the Roadway/Bus solution set in this corridor. This solution set included widening through the entire length of the corridor, grade separated interchanges, and widening of NE 145th Street, which is now is fronted by a mixture of land uses, including single-family and multi-family dwelling units and several commercial developments.

The Kirkland-Sand Point corridor options also received low marks. The freeway option would make significant changes to the neighborhoods near both freeway interchanges (I-5 and I-405) and where the roadway would cross both shores of Lake Washington. The New Crossing arterial roadway would emerge from a tunnel and follow the path of the existing NE 124th Street corridor. Between the added lanes and the light rail line, the resulting roadway would be significantly larger than the existing street, which is in some locations a two-lane residential roadway.

Because communities along SR 520 and I-90 have already been severed by a freeway and none of the solution sets included changes that would have further reduce access

across the freeway, the neighborhood connectivity in these corridors would not be more negatively affected than in baseline conditions.

7.2 Natural Environment

7.2.1 Critical Areas

Based on local and regional determinations of critical or environmentally sensitive areas within the study area, this measure estimated the degree of impact by construction and operation of the alternatives on the surrounding critical areas. Critical areas included wetlands, shorelines, unstable slopes, and areas prone to erosion. To receive a ○ rating, much of a corridor is in critical areas and has direct impacts on those areas. A ◑ rating would correspond to indirect impacts to critical areas near the corridor. A ● would represent an improvement over the baseline conditions.

Critical Area Impacts Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◕	◑	◑	◔	◑	◔	◑
Kirkland-Sand Point Roadways					◔	◔	
Kirkland-Sand Point Ferries						◑	◑
SR 520	◕	○	○	○	○	○	◕
Rail		◑	◔	◔	◔		◑
I-90	◕	◕	◕	◕		◕	◕
Solution Set Summary	◕	◔	◔	○	◔	◔	◑

Critical Area Impacts by Corridor

SR 522 traverses several areas that are prone to erosion. The largest of these are located between Kenmore and Bothell and in Lake Forest Park. There are also several locations where SR 522 is currently close to the Lake Washington shoreline and to wetlands associated with the Sammamish River. Each of these areas would be affected by construction in the MTP '98, MTP Flipped, New Crossing, and Maximize Alternatives. The solution sets with the larger footprints, Roadway/Rail and Roadway/Bus, both had a higher level of impacts to these critical areas.

The new bridges in the Kirkland-Sand Point alternatives would cross the erosion-prone areas on the eastern shore of Lake Washington. Otherwise, these crossings generally avoid critical areas.

The SR 520 corridor crosses several locations prone to erosion, particularly on the east side of the Lake. It also crosses several areas of wetlands (Washington Park Arboretum, Yarrow Bay), both shorelines of Lake Washington, and a slide-prone area at the eastern edge of the study area. Any of the solution sets that involve construction of a wider crossing would have impacts in these areas. The two solution sets that do not increase the size of SR 520, No Action and Maximize Alternatives, have a much lower degree of impact to these critical areas. Any impacts would be associated with replacing the existing floating section of the bridge.

Most of the improvements in the I-90 corridor were confined to the existing roadway right-of-way. The exceptions occurred in those solution sets with light rail. Developing the light rail lines in some solution sets (Roadway/Rail, New Crossing, and Maximize Alternatives) would require construction over the Mercer Slough and across an erosion prone area.

7.2.2 Parks and Refuges

The ratings for parks and refuges impacts measure the degree to which parklands or wildlife refuges are affected by actions in a solution set. Federal Section 4(f) regulations have specific requirements for transportation projects that may impact these resources. The rating for impacts to parks and refuges was similar to that of Critical Areas. To receive a ○ rating, much of a corridor would be in parklands or refuges and would have direct impacts on those areas. A ◑ rating would correspond to indirect impacts to parks and refuges near the corridor.

Parks and Refuges Impacts Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◕	◕	◕	◔	◕	◔	◕
Kirkland-Sand Point Roadways					◑	◔	
Kirkland-Sand Point Ferries						◔	◔
SR 520	◕	○	○	○	○	○	◕
Rail		◑	◔	◔	◑		◑
I-90	◕	◕	◕	◕		◕	◕
Solution Set Summary	◕	◑	◔	◔	◑	◔	◑

Parks and Refuges Impacts by Corridor

The two options that included interchanges and widening in SR 522 corridor also had direct impacts on the parks adjacent to the roadway. The Burke-Gilman Trail, Tracy Owen Station Park, Swamp Creek Park, and Blythe Park are several of the parks that would be affected by widening SR 522.

The difference between the two alternatives in the Kirkland-Sand Point corridor is that the Roadway/Bus option crosses over the Burke-Gilman Trail. By tunneling under Seattle and Kirkland, the Roadway/Bus alternative also avoids most impacts to parks and refuges. The New Crossing alternative would require widening in the vicinity of the trail but does not necessary directly impact the trail.

There are numerous parks in the SR 520 corridor, which is the reason the ratings are low for the construction options there. Montlake Park is just south of SR 520 in the Montlake neighborhood. The Arboretum is bisected by the existing roadway. The Yarrow Bay Wetlands Park is located just north of SR 520 at Yarrow Bay, the 16-acre Wetherill Nature Preserve is located between Hunts Point and Yarrow Bay, and Marymoor Park is immediately adjacent to the freeway near its eastern terminus. With the exception of the No Action and Maximize Alternatives solution sets, the solution sets without a construction component in the SR 520 corridor), all of the solution sets would have direct impacts on parks in the corridor.

The improvements on the I-90 corridor would have no impact on the parks and refuges in the corridor.

7.2.3 ESA Issues

This measure is an assessment of a proposed project's potential for impacts on endangered species. The same rating system employed for Critical Areas and Parks and Refuges was employed for ESA Issues. To receive a 1 rating, much of a corridor is in critical areas and has direct impacts on those areas. A ◑ rating would correspond to indirect impacts to critical areas near the corridor. A ● would represent an improvement over the baseline conditions.

ESA Issues Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◕	◑	◑	◑	◑	◔	◑
Kirkland-Sand Point Roadways					◔	◔	
Kirkland-Sand Point Ferries						◔	◑
SR 520	◕	◔	○	○	◔	○	◕
Rail		◑	◔	◔	◑		◔
I-90	◕	◕	◕	◕		◕	◕
Solution Set Summary	◕	◑	○	◔	◑	◔	◑

ESA Issues Impacts by Corridor

In the SR 522 corridor, all construction options cross one or more ESA-sensitive salmon-bearing waterways, including McAleer Creek, North Creek, and the Sammamish River.

The Kirkland-Sand Point bridge alternatives have similar problems, in that the new bridge would put a new physical barrier in the water that would block the passage of fish moving near the surface in the middle of the lake. Any high-rise sections of the bridges would produce shading and other shoreline impacts.

The lowest ratings were given to the SR 520 corridor. The Montlake Cut and Union Bay is an ESA-sensitive migration route an rearing area for all salmon in the Cedar River and Sammamish River systems. Any new or enlarged facility in this area will have an impact either during construction or as a completed facility, or both. On the east side of Lake Washington, SR 520 traverses bald eagle territory. The ratings for the solution sets in this corridor varied depending on the degree of widening that is to occur. The No Action and Maximize Alternatives would retain the existing footprint of SR 520 and therefore received higher ratings. The MTP '98 and New Crossing Alternatives have six-lane crossing, which would have a lesser impact than the eight-lane crossing in Roadway/Bus or the six-lane-plus-light-rail MTP Flipped and Roadway/Rail configurations.

The I-90 corridor improvements would not have an impact on ESA issues overall, although areas near the I-90 corridor at Mercer Slough could be impacted as light rail transitioned from the I-90 right-of-way to a north/south route to Bellevue and Redmond.

7.2.4 Air Quality

Similar to the other environmental ratings, the ratings for air quality are qualitative rather than quantitative. Air quality degradation (specifically, CO emissions) is directly proportional to the degree of traffic congestion. The travel demand forecasting results provided estimates of the traffic volumes in each corridor, which in turn provided an estimate of the duration of congested conditions in the corridor.

The review did not include the air quality impacts of ferry service, as reliable data was not available. It was not possible to provide comparisons to the Washington State Ferries services, which had historically been exempt from environmental reviews. However, recent environmental challenges to ferry service in the Puget Sound, as well as new concerns about ferry-related air pollution in the San Francisco Bay area, suggest that further study of air quality impacts for ferry options would be needed.

Air Quality Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◑	◑	◑	◑	◑	◔	◑
Kirkland-Sand Point Roadways					◔	◔	
Kirkland-Sand Point Ferries						◕	◕
SR 520	◑	◑	◑	◑	◑	◔	◑
Rail		◑	◕	◕	◑		◕
I-90	◑	◕	◑	◑		◑	◑
Solution Set Summary	◑	◑	◑	◑	◑	◑	◑

7.2.5 Water Quality

Water Quality Summary

	No Action	MTP '98	MTP Flipped	Roadway/ Rail	New Crossing	Roadway/ Bus	Maximize Alternatives
SR 522	◑	◑	◑	◑	◑	○	◑
Kirkland-Sand Point Roadways					◔	○	
Kirkland-Sand Point Ferries						○	◔
SR 520	◔	◑	◑	◑	◑	◑	◔
Rail		◑	◑	◑	◑		◑
I-90	◑	◕	◕	◑		◕	◕
Solution Set Summary	◑	◑	◑	◑	◑	◑	◑

Water Quality Impacts by Corridor

Water quality regulations have been strengthened in recent years. New standards are in place that require the construction of such treatment systems as oil-water separators and sedimentation ponds to prevent roadway runoff from draining directly into waterways. No such requirements existed at the time of the last major construction in the SR 520 and SR 522 corridors. As a result, the quality of water draining into Lake Washington would be improved by any construction project, since new construction would be required to adhere to the more stringent modern regulations.

There are other factors that contribute to the degradation of water quality, including roadway dirt or litter that might blow into the water from a bridge. As the level of traffic increases, the likelihood of this type of foreign matter entering the water increases. Thus, the Roadway/Bus solution set, which has a third bridge and added lanes on SR 522 and SR 520, received lower ratings than other solution sets.

The I-90 corridor generally received higher scores than the other corridors. The I-90 floating bridges were built much more recently than the SR 520 bridge, and as a result have a higher level of water treatment in place. In addition, several of the solution sets lower the traffic volumes on I-90, which would lower the potential for debris and traffic-related contaminants to enter the water.

The two ferry options received low scores on water quality on the grounds that increased activity over water increases the potential for leakage of contaminants, especially in the case of the bus-only ferry.

7.3 Mitigation Approach

The impacts of transportation facilities to neighborhoods and the environment were clearly a primary concern of the committee. From the first meeting, committee members identified their environmental concerns, and a number of their suggestions throughout the project focused on mitigation and enhancement possibilities. (See Figure 4-6 for a listing of mitigation and enhancement concepts that were suggested.) At several stages in the study, staff provided technical products and presentations to further inform the committee about resources, impacts and mitigation approaches.

While the committee's recommendations did not detail a full set of mitigation or enhancement actions for each of its corridor recommendations, they did suggest a variety of actions, and described a process that should be followed to develop mitigation actions and to measure their success. Their recommendations for community enhancement and mitigation stated:

> *"Mitigation and enhancement must be integral to and inseparable from the proposed transportation improvements. Project design and mitigation elements should potentially include lids, structures, grade separation, tunnels. Mitigation of impacts caused by existing transportation facilities must be considered. An extensive and active involvement process to engage affected communities and regional interests should be integral to the EIS, design and construction process."*

In subsequent parts of the recommendation, the committee reiterated the kinds of impacts and concerns they felt were particularly significant. In discussing SR 520, they specifically recommended bicycle and pedestrian facilities for all alternatives. They also called for consideration of a "minimum footprint" alternative that would provide bicycle and pedestrian facilities, transit and HOV access treatments within a minimal right-of-way.

In another section, the committee also wrote that "transportation alternatives developed should be designed to avoid or minimize identified impacts." For enhancements, the committee recommended that "transportation alternatives should enhance local communities", and this was followed by a listing of goals, conditions and facilities that could be supported, provided or improved.

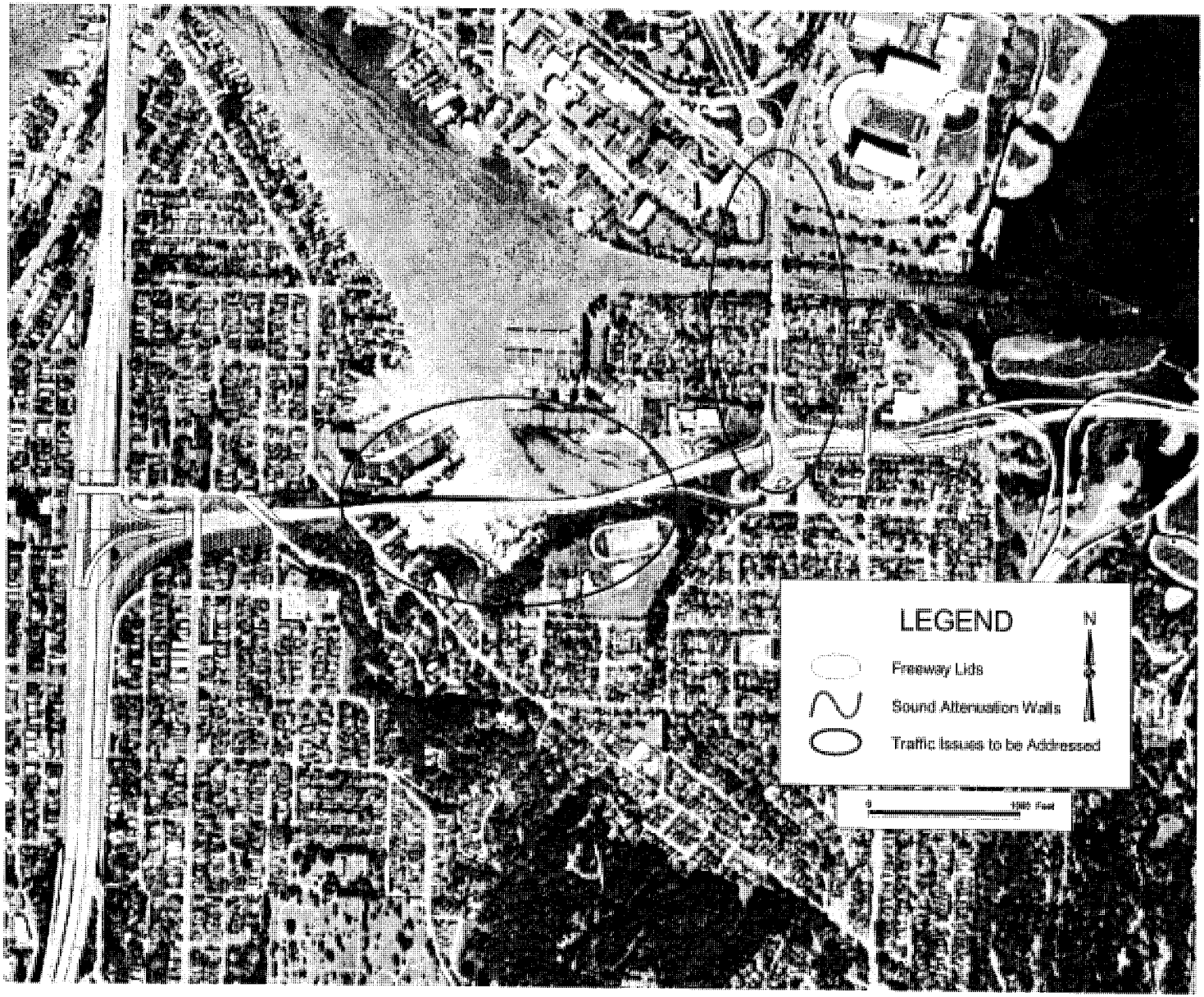
7.3.1 Technical Products and Committee Suggestions

In many cases, a number of the conceptual designs that were developed for inclusion in the solution sets incorporated substantial mitigation or impact avoidance measures. These included a range of approaches to improve mobility on and access to SR 520, especially in the shoreline areas where the corridor is surrounded by aquatic resources, wetlands, parklands and community resources, as well as private property. Impact avoidance was also a major part of determining the routes (and ultimately the recommended tunnels) for the New Freeway and the Kirkland-Sand Point arterial. Most of the light rail routes evaluated were based on earlier alternatives analysis studies that also considered environmental impact factors.

Several other technical products for the committee provided information about resources and potential impacts along the Trans-Lake corridors. Following the report card "findings" on the solution sets, additional graphics detailing resources and impacts were provided to the committee. "Strip maps" of the corridors, drawn from the same GIS databases that were used in the environmental impact evaluations, identified "hot spot" areas along the corridors, and allowed the committee to suggest mitigation approaches. In a workshop setting, committee members were encouraged to review the corridor-level graphics, make comments, sketch out mitigation measures, or offer other suggestions. Staff subsequently estimated the cost ranges for the suggested mitigation, and provided that information to the committee. The cost estimates for mitigation approaches are provided in Chapter 6.

The committees input from the workshop was documented in the June 2, 1999, meeting summary. In addition, staff produced a white paper that incorporated the committee's suggestions, with additional revisions and refinements based on engineering and topographic considerations. Estimated cost ranges were also provided in that paper. Figures 7-1 through 7-3 show the mappings of mitigations on SR 520 as provided to the committee. The mitigation costs are discussed in Chapter 8. The committee's comments and questions tended to focus on several major areas of concern for neighborhoods and the environment. Natural resources concerns focused on salmon migration routes, and water and air pollution. Neighborhood concerns included noise, cut-through traffic, connections within neighborhoods, and views (including aesthetics). Sound walls, depressed roadways and lids were among the approaches suggested, and a committee members suggested several areas they felt would be particularly sensitive to noise impacts. These included users of the Arboretum and residents along both sides of the lake. (Prior to the meeting, a lid from the east end of Lake Washington to Bellevue Way

was proposed by three of the city councils on the east side of the lake. Text describing the councils' action was provided to the committee members.) General cost estimates for lids and tunnels were provided, with costs ranging from several hundred million to several billion depending on the extent of the treatment and the surrounding topography.

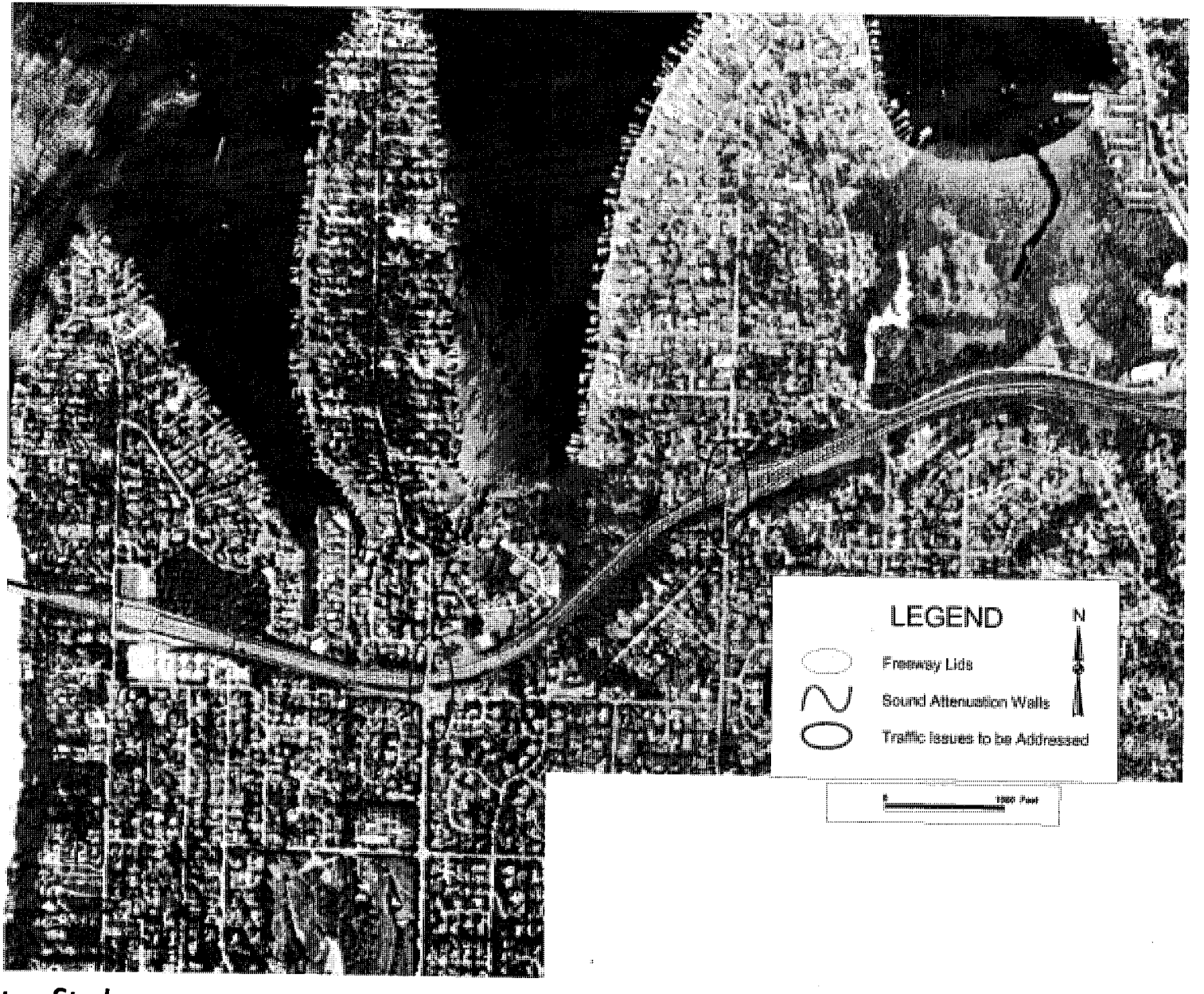


Trans-Lake Washington Study

Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 234-1631-016 (A17) (S)

N

Figure 7-1
Suggested Mitigation
West Side of SR520

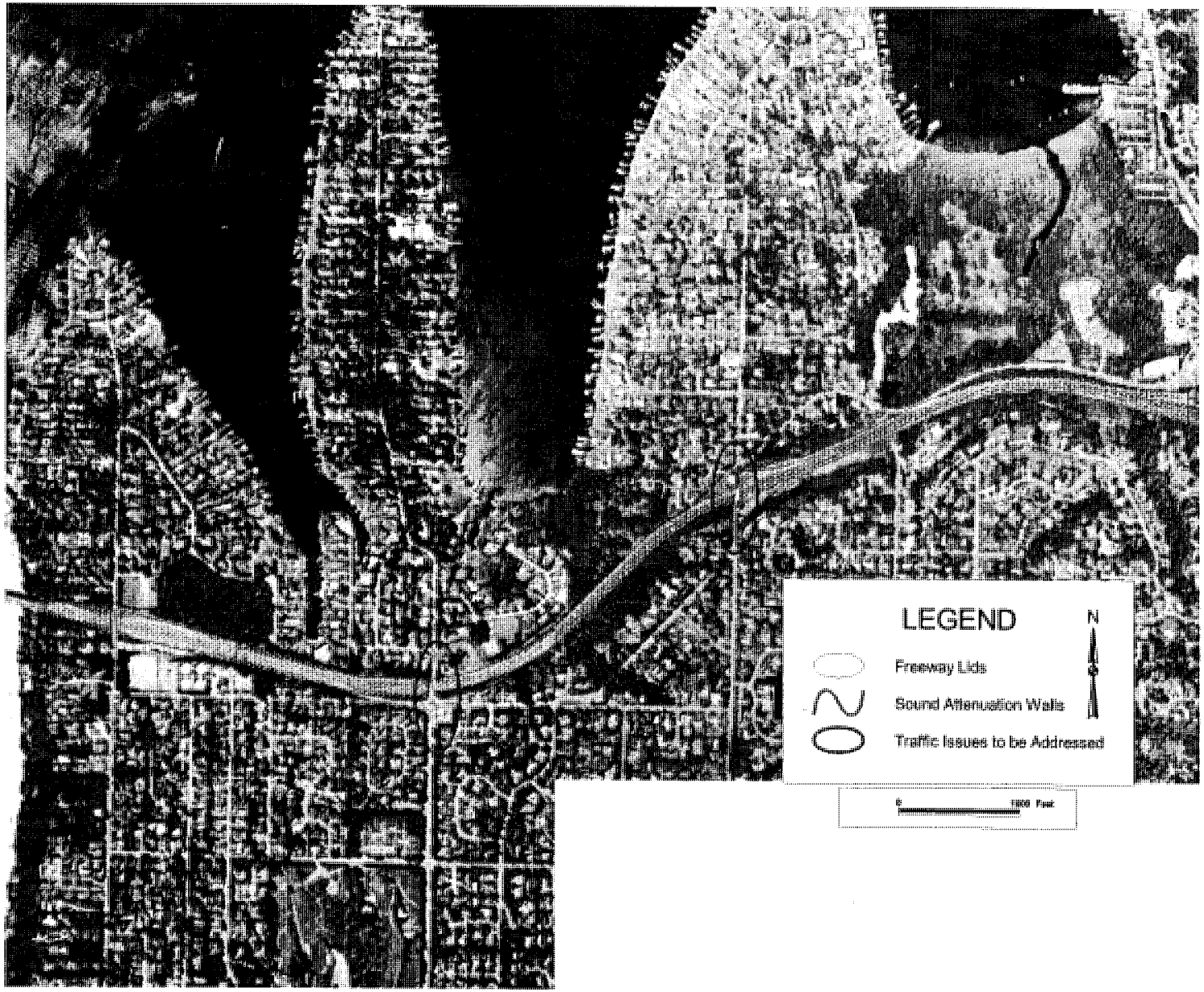


Trans-Lake Washington Study

Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 234-1631-016 (A17) (S)

N

Figure 7-2
Partial Lid Approach
Suggested Mitigation
East Side of SR520



Trans-Lake Washington Study

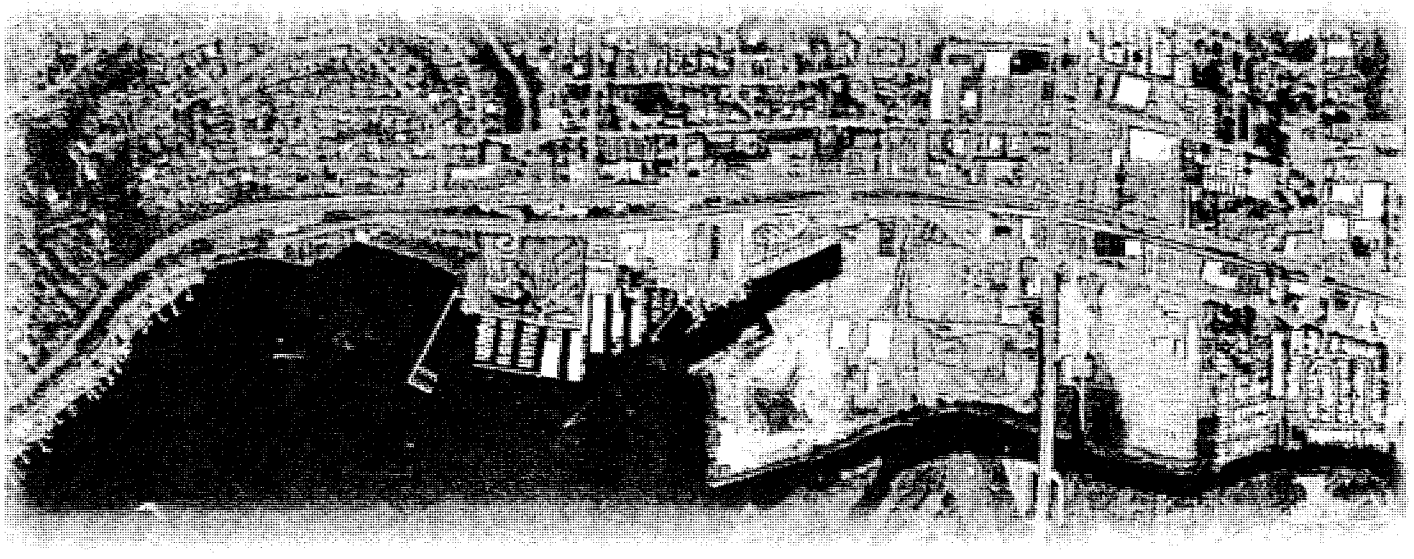
Parametrix, Inc., CH2M Hill, Parsons Brinckerhoff 234-1631-016 (A17) (S)

N

Figure 7-3
Full Lid Approach
Suggested Mitigation
East Side of SR520

Trans-Lake Washington Study

8. Cost Methods and Findings



8. Cost Methods and Findings

The estimates of costs for each of the solution sets were based on conceptual design definitions for the solution sets (Preliminary Definition of Solution Sets, March 15, 1999). In both the written materials and in subsequent presentations, project staff had described the project definitions. The resulting cost information was subsequently provided as an early planning-level indicator of future engineering results. The committee was advised that actual costs could vary with more detailed engineering. For this reason, a liberal contingency was applied to the solution sets to provide a high to low range of costs for the committee members to consider.

The cost estimates are based on detailed breakdowns of anticipated capital costs for the alternatives, using methods similar to those used for estimation in WSDOT's northwest regional office. The breakdown includes a large number of cost estimating factors, including the length of the proposed improvement, the number of lanes, the right-of-way required, and other structural, systems, and construction related elements. The contingency amount included a 20 percent increase for each solution set, as well as a 15 percent increase to each of the corridor improvements. The estimates also assumed preliminary engineering of 15 percent of construction costs, construction administration of 15 percent, and a sales tax of 8.6 percent. Depending on the needs by segment for the roadway, other costs included traffic control, removals (demolition or removal of built features in the corridor), and mobilization (assembling construction teams).

Committee members expressed a considerable amount of interest in the methods that could be applied in a cost analysis of the alternatives. In particular, a number of committee members requested more information on transportation-pricing studies in the region, which provided calculations of other private costs and environmental costs. These costs for transportation could involve damage to the environment, or measure direct private costs for operating a motor vehicle. Other costs, known as "opportunity costs" in economic terms, would involve the loss to productivity, time, health or other quality of life issues that would result from a congested transportation system. The Puget Sound Regional Council's Transportation Pricing task Force has been leading the review of transportation costs and policies in the region. Their findings had not yet been made public at the time of the Trans-Lake Washington Study, and there was no established method to apply indirect costs to individual corridors. For this reason, only capital costs were provided for comparison.

The costs summary by solution set are provided in summary in Table 8-1. Costs for individual solution sets are provided in Tables 8-2 through 8-8.

Table 8-1. Summary Comparison of Costs by Solution Set and Corridor

	Preliminary Solution Set Cost Summary						
	Solution Sets						
	No Action	MTP '98	MTP Flipped	Roadway/Rail	New Crossing	Roadway/Bus	Maximize Alternative
SR 522 Corridor							
Roadway Improvements	$478,100	$97,000,000	$97,000,000	$174,744,400	$55,658,500	$149,539,000	$97,000,000
Rail Improvements	–	–	–	–	–	–	–
Corridor Subtotal	**$478,100**	**$97,000,000**	**$97,000,000**	**$174,744,400**	**$55,658,500**	**$149,539,000**	**$97,000,000**
Kirkland-Sand Point Corridor							
Roadway Improvements	–	–	–	–	$1,009,227,000	$4,792,761,000	–
Rail Improvements	–	–	–	–	$933,695,697	–	–
Corridor Subtotal	–	–	–	–	**$1,942,922,697**	**$4,792,761,000**	–
Kirkland-Sand Point Bus/ Passenger Ferry							
Ferry Improvements	–	–	–	–	–	$51,746,000	$28,503,000
SR 520 Corridor							
Roadway Improvements	$344,687,200	$1,350,571,000	$1,308,246,000	$2,363,071,500	$1,350,571,275	$2,157,743,300	$344,687,200
Rail Improvements	–	–	$1,080,093,068	$1,787,846,040	–	–	–
Corridor Subtotal	**$344,687,200**	**$1,350,571,000**	**$2,388,339,068**	**$4,150,917,540**	**$1,350,571,275**	**$2,157,743,300**	**$344,687,200**
148th Avenue NE Arterial Corridor							
Roadway Improvements	–	–	–	–	–	$28,705,900	–
I-90 Corridor							
Roadway Improvements	–	–	$15,773,000	–	–	$15,773,000	–
Rail Improvements	–	$662,304,000	–	$916,382,306	$979,970,723	–	$1,977,483,755
Corridor Subtotal	–	**$662,304,000**	**$15,773,000**	**$916,382,306**	**$979,970,723**	**$15,773,000**	**$1,977,483,755**
Subtotal	**$345,165,000**	**$2,109,875,000**	**$2,501,112,000**	**$5,242,044,000**	**$4,329,123,000**	**$7,196,268,000**	**$2,447,674,000**
Solution Set Scope Contingency @ 20%	**$69,033,000**	**$421,975,000**	**$500,222,000**	**$1,048,409,000**	**$865,825,000**	**$1,439,254,000**	**$489,535,000**
Solution Set Total	**$414,198,000**	**$2,531,850,000**	**$3,001,334,000**	**$6,290,453,000**	**$5,194,948,000**	**$8,635,522,000**	**$2,937,209,000**

Table 8-2. No Action Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Install Limited Transit Signal Priority Improvements	$ 478,100	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 478,100	**$ 478,100**
SR 520 Corridor		
Roadway Improvements		
Replace Evergreen Point Floating Bridge (floating portion only)	$344,687,200	
Rail Improvements		
None	$ –	
Subtotal: SR 520 Corridor	$344,687,200	**$344,687,200**
I-90 Corridor		
Roadway Improvements		
None	$ –	
Rail Improvements		
None	$ –	
Subtotal: I-90 Corridor	$ –	**$ –**
Subtotal: No Action Solution Set	**Say**	**$345,165,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$ 69,033,000**
Total: No Action Solution Set		**$414,198,000**

Table 8-3. MTP Flipped Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Construct Transit Lanes and add Transit Signal Priority Improvements	$ 97,000,000	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 97,000,000	**$ 97,000,000**
SR 520 Corridor		
Roadway Improvements		
Construct (1) HOV Lane from I-5 to I-405 each way	$1,222,459,000	
Construct Mercer Street to NB I-5 Direct Connection (new tunnel and on-ramp)	$ 66,956,000	
Construction SB I-5 to EB SR 520 Connection (reconstruct tunnel under NB I-5 and Express Lanes)	$ 18,831,000	
Rail Improvements		
Rail Transit: Seattle-Bellevue-Overlake	$1,080,093,068	
Subtotal: SR 520 Corridor	$2,388,339,068	**$2,388,339,068**
I-90 Corridor		
Roadway Improvements		
Convert Center Roadway to 2-way HOV	$ 15,773,000	
Rail Improvements		
None	$ –	
Subtotal: I-90 Corridor	$ 15,773,000	**$ 15,773,000**
Subtotal: MTP Flipped Solution Set	**Say**	**$2,501,112,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$ 500,222,000**
Total: MTP Flipped Solution Set		**$3,001,334,000**

Table 8-4. MTP '98 Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Construct Transit Lanes and add Transit Signal Priority Improvements	$ 97,000,000	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 97,000,000	**$ 97,000,000**
SR 520 Corridor		
Roadway Improvements		
Construct (1) HOV Lane from I-5 to I-405 each way	$1,264,784,000	
Construct Mercer Street to NB I-5 Direct Connection (new tunnel and on-ramp)	$ 66,956,000	
Construction SB I-5 to EB SR 520 Connection (reconstruct tunnel under NB I-5 and Express Lanes)	$ 18,831,000	
Rail Improvements		
None	$ –	
Subtotal: SR 520 Corridor	$1,350,571,000	**$1,350,571,000**
I-90 Corridor		
Roadway Improvements		
None	$ –	
Rail Improvements		
Rail Transit: Seattle-Bellevue-Overlake	$ 662,304,000	
Subtotal: I-90 Corridor	$ 662,304,000	**$ 662,304,000**
Subtotal: MTP '98 Solution Set	**Say**	**$2,109,875,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$ 421,975,000**
Total: MTP '98 Solution Set		**$2,531,850,000**

Table 8-5. Roadway/Rail Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Construct Transit Lanes and add Transit Signal Priority Improvements	$ 97,000,000	
Construct Grade Separation at SR 104	$ 44,515,700	
Construct Grade Separation at 68th Avenue NE	$ 33,228,700	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 174,744,400	**$ 174,744,400**
SR 520 Corridor		
Roadway Improvements		
Construct (1) GP Lane from I-5 to I-405 each way	$1,141,124,500	
Construct Fairview/Eastlake to SR 520 Tunnels	$ 288,747,750	
Construct Pacific Street to SR 520 On/Off Ramp	$ 933,199,250	
Rail Improvements		
Rail Transit: Ballard-University District-Redmond	$1,787,846,040	
Subtotal: SR 520 Corridor	$4,150,917,540	**$4,150,917,540**
I-90 Corridor		
Roadway Improvements		
None	$ –	
Rail Improvements		
Rail Transit: Seattle-Bellevue-Kirkland/Totem Lake	$ 916,382,306	
Subtotal: I-90 Corridor	$ 916,382,306	**$ 916,382,306**
Subtotal: Roadway/Rail Solution Set	**Say**	**$5,242,044,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$1,048,408,800**
Total: Roadway/Rail Solution Set		**$6,290,453,000**

Table 8-6. Roadway/Bus Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Construct (1) HOV Lane each way on SR 522 from I-405 to SR 523	$ 32,900,600	
Construct (1) HOV Lane each way on SR 523 from SR 522 to I-5	$ 38,894,000	
Construct Grade Separation at SR 104	$ 44,515,700	
Construct Grade Separation at 68th Avenue NE	$ 33,228,700	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 149,539,000	**$ 149,539,000**
New Freeway (I-5 to I-405)		
Roadway Improvements		
Construct 6-lane Underground Freeway (2-GP and 1-HOV lane each way) with Floating Bridge and Connections to Sand Point Way NE	$4,792,761,000	
Rail Improvements		
None	$ –	
Subtotal: New Freeway (I-5 to I-405)	$4,792,761,000	**$4,792,761,000**
Kirkland-Sand Point Bus/Passenger Ferry		
Ferry Improvements		
Construct Loading Facilities and Implement Bus/Passenger Ferry Service between Kirkland and Sand Point	$ 51,746,000	
Subtotal: Kirkland-Sand Point Bus/Passenger Ferry	$ 51,746,000	**$ 51,746,000**
SR 520 Corridor		
Roadway Improvements		
Construct (1) HOV and (1) GP Lane from I-5 to I-405 each way with Direct Connections to I-5 Express Lanes	$1,806,224,300	
Construct Fairview/Eastlake to SR 520 Tunnels	$ 288,747,750	
Construct Reversible Direct Connection to I-5 Express Lanes from SR 520 EB and WB HOV Lanes	$ 43,939,875	
Construct SB I-5 to EB SR 520 Connection (reconstruct tunnel under NB I-5 and Express Lanes)	$ 18,831,375	
Rail Improvements		
None	$ –	
Subtotal: SR 520 Corridor	$2,157,743,300	**$2,157,743,300**
148th Avenue NE Arterial Corridor		
Roadway Improvements		
Construct (1) Additional Lane in each Direction between SR 520 and I-90	$ 28,705,900	
Subtotal: SR 148th Avenue NE Arterial Corridor	$ 28,705,900	**$ 28,705,900**
I-90 Corridor		
Roadway Improvements		
Convert Center Roadway to 2-way HOV	$ 15,773,000	
Rail Improvements		
None	$ –	
Subtotal: I-90 Corridor	$ 15,773,000	**$ 15,773,000**
Subtotal: Roadway/Bus Solution Set	**Say**	**$7,196,268,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$1,439,254,000**
Total: Roadway/Bus Solution Set		**$8,635,522,000**

Table 8-7. New Crossing Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Construct Transit Lanes and add Transit Signal Priority Improvements on SR 522: I-405 to SR 523	$ 55,358,500	
Add Transit Signal Priority Improvements on SR 523: SR 522 to I-5	$ 300,000	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 55,658,500	**$ 55,658,500**
Kirkland-Sand Point Corridor (New)		
Roadway Improvements		
Construct 4-lane Arterial between Sand Point Way NE at NE 85th Street in Seattle, and NE 124th Street in Kirkland	$1,009,227,000	
Rail Improvements		
Rail Transit: Seattle-University District-Kirkland-Redmond	$ 933,695,697	
Subtotal: Kirkland-Sand Point Corridor (New)	$1,942,922,697	**$1,942,922,697**
SR 520 Corridor		
Roadway Improvements		
Construct (1) HOV Lane from I-5 to I-405 Each Way	$1,264,783,900	
Construct Mercer Street to NB I-5 Direct Connection (new tunnel and on-ramp)	$ 66,956,000	
Construct SB I-5 to EB SR 520 Connection (reconstruct tunnel under NB I-5 and Express Lanes)	$ 18,831,375	
Rail Improvements		
None	$ –	
Subtotal: SR 520 Corridor	$1,350,571,275	**$1,350,571,275**
I-90 Corridor		
Roadway Improvements		
None	$ –	
Rail Improvements		
Rail Transit: Seattle-Bellevue-Redmond	$ 979,970,723	
Subtotal: I-90 Corridor	$ 979,970,723	**$ 979,970,723**
Subtotal: New Crossing Solution Set	**Say**	**$4,329,123,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$ 865,825,000**
Total: New Crossing Solution Set		**$5,194,948,000**

Table 8-8. Maximize Alternatives Solution Set – General Planning-Level Cost Estimate		
SR 522 Corridor		
Roadway Improvements		
Construct Transit Lanes and add Transit Signal Priority Improvements	$ 7,000,000	
Rail Improvements		
None	$ –	
Subtotal: SR 522 Corridor	$ 97,000,000	**$ 97,000,000**
Kirkland-Sand Point Bus/Passenger Ferry		
Ferry Improvements		
Construct Loading and Offshore Facilities and Implement Passenger only Ferry Service between Kirkland and Montlake	$ 28,503,000	
Subtotal: Kirkland-Sand Point Bus/Passenger Ferry	$ 28,503,000	**$ 28,503,000**
SR 520 Corridor		
Roadway Improvements		
Replace Evergreen Point Floating Bridge (floating portion only)	$ 344,687,200	
Rail Improvements		
None	$ –	
Subtotal: SR 520 Corridor	$ 344,687,200	**$ 344,687,200**
I-90 Corridor		
Roadway Improvements		
None	$ –	
Rail Improvements		
Rail Transit: Seattle-Bellevue-Redmond	$1,267,577,346	
Rail Transit: Issaquah-Bellevue-Kirkland	$ 709,906,409	
Subtotal: I-90 Corridor	$1,977,483,755	**$1,977,483,755**
Subtotal: Maximize Alternatives Solution Set	**Say**	**$2,447,674,000**
Estimated Mitigation and Enhancement		**$ –**
Solution Set Scope Contingency @ 20%		**$ 489,535,000**
Total: Maximize Alternatives Solution Set		**$2,937,209,000**

8.1 Mitigation Costs

Although estimated costs for the solution sets did not include mitigation, the committee did provide a range of potential mitigation measures that could be considered at future stages. Chapter 7 discussed these mitigation suggestions, and provided maps of possible sites on the SR 520 corridor.

The committee's mitigation discussions used the landscaped lids on I-90 as a reference point.

Staff also conducted a review of the committee's suggestions and made some revisions and refinements based on the characteristics of existing roadways, topography, the environment and other considerations. In some areas, certain types of mitigation measures were considered inappropriate because they could substantially degrade viewsheds, or they would reduce access to community facilities. Staff also identified areas where mitigation measures such as lids could provide more opportunities to expand or enhance recreational facilities, or improve visual features or community viewsheds. The general criteria for mitigation of impacts used for the siting and cost estimating of lids on SR 520 included:

- Land uses north and south of the corridor between the east bank of Lake Washington and Bellevue Way NE
- Existing topographic features north and south of the corridor
- Extent of construction necessary for siting and blending of highway lids with surrounding facilities and topography
- Other engineering requirements such as vertical clearance, ventilation, lighting, if re safety, and other similar criteria used for the I-90 project

The results of the mitigation cost estimates for the SR 520 corridor are provided in Table 8-9.

Table 8-9. SR 520 Corridor Mitigation Cost Estimates for Lid Treatments[1]

West Side Lids	**Costs**
Roanoke Interchange	$363,554,297
Montlake Interchange	$127,382,063
Total West Side	$490,936,360
Estimated Lid Cost per SF	$590
East Side Lids	
Evergreen Point Road Lid	$122,448,769
84th Avenue NE Interchange Lid	$240,847,819
92nd Avenue NE Lid	$435,307,950
Total East Side	$798,604,534
Estimated Lid Cost per SF	$670
East Side Full Lid Treatment Lake Washington to Bellevue Way	$2,068,743,600

(1) Lid treatments were planning-level concepts only, and are based on preliminary siting and cost estimating estimates. Although contingency amounts were included, changes to siting, features, or other unforeseen environmental or engineering constraints could substantially affect costs.

Trans-Lake Washington Study

9. Public Involvement and Outreach

9. Public Involvement and Outreach

Public involvement was a key component of the Trans-Lake Washington Study throughout the study process. The 47-member Study Committee was selected to include the various environmental and modal viewpoints of the community, as well as state and locally-elected officials representing the study area. There was also a concerted effort to reach out to the general public. The public involvement and outreach program was multi-faceted and designed to both inform the public of the study as it progressed to provide information about likely future transportation conditions, and to elicit their ideas and opinions. This chapter describes the various ways the public participated in the study.

- *Crossings* newsletter
- Toll-free hotline
- Web site
- Presentations to special interest groups, government and civic agencies, and major employers
- Public workshops
- Media
- Public surveys

9.1 *Crossings* – The Trans-Lake Washington Study Newsletter

Beginning in August of 1998, *Crossings*, the Trans-Lake Washington Study Newsletter, was mailed on a monthly basis to approximately 3,150 addresses, including special interest groups, government agencies, civic organizations, Native American tribes, businesses, and individual citizens. The newsletter contained information on the study committee's progress for the month, as well as anticipated next steps. It also included dates and times of upcoming committee meetings, invitations to public workshops, and advertised access to the hotline and web site. Each newsletter also included a comment form with several questions relevant to the study at that stage, and invited answers to the questions or general comments. In all, about 150 readers responded using the comment form, which they submitted by mail and fax. These comments were summarized and provided to the committee each month.

Crossings proved to be a very effective way to keep virtually all identified constituencies informed in a timely manner about the study. It was the most user-friendly literature available to the general public. For most of the monthly mailings, *Crossings* was a simple, two-sided 8.5- x 14-inch three-fold sheet. The last two newsletters were longer editions in order to convey the key information about the draft solution sets (June 1999) and the full text of the Study Committee recommendations (August 1999).

9.2 Toll-Free Hotline

A toll-free hotline was set up at the beginning of the study and advertised in the *Crossings* newsletter and on the website. A caller could access the hotline 24 hours a day. The hotline provided a recorded message that included up-to-date information about the status of the study, as well as dates and times of upcoming meetings, and invited the caller to leave their comments. These comments were retrieved and transcribed on a daily basis, calls returned if specific requests were left, and a summary provided to the committee at each of their monthly meetings. Approximately 200 callers left recorded messages over the period of the study.

The hotline was an effective tool for communicating with study constituencies at their convenience. It was also a useful mechanism for feedback as to what other types of communication strategies were working. On several occasions, the hotline received a flurry of calls after a news story was printed or a neighborhood flyer was distributed. Comments on the hotline came from all parts of the study area and represented a vast array of opinions. At each committee meeting, the materials included a summary of the calls received on the hotline.

9.3 Web Site

The Trans-Lake Washington Study web site, located at http:\\www.wsdot.wa.gov\translake, was also established at the beginning of the study. It was designed to allow the public to view and print out all documents supplied to the Study Committee, as well as to read the latest issue of the *Crossings* newsletter, which reported on the monthly progress of the Study Committee. The site also encouraged feedback through a comment page, which invited e-mail comments on the study in general. It also responded to questions. Approximately 300 people submitted comments through the website or e-mail. The messages were also summarized for the Study Committee on a monthly basis, and the OUM Project Manager responded by e-mail to each commenter.

The web site was designed to provide easy access to the latest news on the study and all the study documents. The home page was updated monthly with the latest issue of *Crossings*. Also included were buttons to access the Study's Framework Document, the list of Study Committee members, a study area map, downloadable access to all Study Committee meeting agendas, meeting summaries, and handouts, and links to the media coverage in the *Seattle Times*, *Seattle P-I* and *Eastside Journal*.

The web site proved to be a convenient way to reach a large number of people in all geographic areas and to distribute large amounts of information in a timely manner. Some people took paragraphs of text from the web site and posted it on their organization's web site, or provided links to the Trans-Lake Washington Study web site, thus further broadening the audience.

9.4 Presentations to Special Interest Groups, Government and Civic Agencies, and Major Employers

Another ongoing public involvement strategy was outreach to special interest groups, government and civic agencies, and major employers. Table 9-1 lists the groups that

were involved. Initiation of this effort began with the mailing of a postcard to 250 organizations which included major employers such as Microsoft, REI and Primex Aerospace, public interest groups such as The Cascade Bicycle Club, and government and business groups such as the Greater Redmond Transportation Management Association and the Bellevue Chamber of Commerce. Follow-up calls to offer presentations or informational materials on the study were then made to every organization that received a postcard.

The response, though not overwhelming, was positive. Even though they may have declined a presentation, many groups requested more information via newsletters, e-mail or the web site. Some requested display materials for use at their meetings. Twenty-four organizations requested presentations. See the Table 9-1 below for a list of presentations given during the duration of the study.

Table 9-1. Trans-Lake Presentations to Groups in Study Area

January '99	February '99	March '99	April '99	May '99	June '99
Clyde Hill City Council	Bellevue Chamber of Commerce	City of Bellevue	Portage Bay/ Roanoke Park Community Council	Laurelhurst Community Club	Bellevue Chamber of Commerce
Greater Redmond TMA	Sierra Club	League of Women Voters Land Use Committee	Eastside Transportation Committee	Seattle Chamber of Commerce	Montlake Community Council
	City of Kirkland	Seattle Community Council Federation	King County City Managers	University District Chamber of Commerce	PSRC Transportation Policy Group
	Seattle City Council Transportation Committee			Primex Aerospace	Eastside Transportation Partnership
				Cascade Bicycle Club	League of Women Voters Forum
				North Seattle Industrial Association	Seattle City Council Transportation Committee

9.5 Public Workshops

Public workshops were held at two key points in the study process. The first set of workshops took place in the Fall of 1998 when the Study Committee was creating a Draft Problem Statement and beginning to develop a list of mobility concepts for evaluation. The second set took place in late May-early June 1999, when the committee asked for comment on their seven draft solution sets.

9.5.1 Public Workshops Set No. 1

The first round of public workshops was held in late September and early October of 1998. Three evening workshops were held in Bothell, Seattle, and Bellevue. This early outreach allowed the public to give feedback to the Study Committee on their draft

problem statement and draft evaluation criteria, and to add their ideas about how to solve the problems. The workshops were advertised in local newspapers, on the web site and through the *Crossings* newsletter.

The workshops were attended by a total of approximately 70 members of the public and by Study Committee members who came to listen to their comments and share information. Participants at the workshops recognized the complexity of the issues. They endorsed potential concepts for improving mobility ranging from construction of new lanes on SR 520 or a bridge farther north, to a "no new concrete" alternative, to a water taxi service, to covered bicycle lanes, to drivers' education programs to improve traffic flow. Many people suggested using other metropolitan areas as models for solving the problem. Some participants expressed strong support for increased transit and HOV programs, others expressed a strong orientation to adding general-purpose capacity. A summary of workshop comments is included in Appendix 7.

9.5.2 Public Workshops Set No. 2

Over 200 people turned out in Seattle, Bellevue, Lake Forest Park, and Kirkland over four evenings in late May and early June 1999 to learn more about the Trans-Lake solution sets and to express their opinions on the best – and worst – choices for improving mobility. This second round of workshops were advertised in newspapers and on the website, and an invitational postcard was sent to the entire newsletter mailing list. The workshops began with a short presentation to introduce the seven draft solution sets. The presentation was followed by an interactive exercise called *Red Light/Green Light*. In the exercise, participants first chose which solution set they preferred most, and joined others of like mind. Then they chose with a green dot their favorite aspect of the solution set. With a yellow dot they chose an aspect of another solution set they wanted to see included in their chosen solution set. Finally, with a red dot they chose an aspect of any solution set they did not want to see implemented under any circumstance. Discussion was held in small groups, and then reported back to the group as a whole. A summary of the comments is provided in Appendix 7.

Although participants at the Seattle workshop held in the Montlake neighborhood opted not to take part in the exercise, it was well received at the three other workshops. Participants were able to clearly hear the opinions of fellow citizens as to why they chose their solutions, and why they did not like certain ideas. The exercise has since been requested by several organizations, and has been used in a variety of forums.

A number of participants expressed support for adding HOV or general-purpose capacity to SR 520, as well as increasing regional emphasis on transportation demand management. Solutions involving a new Sand Point-to-Kirkland bridge were controversial and received little support. What was undoubtedly most effective about the workshops is that participants heard the pros and cons of the various alternatives, as articulated by their neighbors, which developed awareness of the complexity of the issues that the Study Committee members were grappling with.

9.5.3 Media

The media was invited to cover any and all Trans-Lake Washington Study events. A press release announced each Study Committee meeting and previewed the issues that

were to be discussed. TV news and the three major papers in the area (*Seattle Times*, *Seattle P-I*, and *Eastside Journal*) all assigned reporters to the study and regularly reported on the Study Committee meetings. The study received Sunday front page coverage (and a full page color graphic) in the *Seattle Times*, May 9, 1999. These stories disseminated study information to a broad audience.

9.6 1999 Trans-Lake Washington Origin and Destination Survey

On two consecutive weekdays in early May 1999 during AM peak period and PM peak period, license plates of vehicles crossing the SR 520 bridge, the I-90 bridge, and traversing SR 522 were videotaped. A total of 59,415 license plates were videotaped; after screening out duplicates and out-of-state vehicles, 46,764 license plate numbers were matched against the Department of Licensing database. A stratified random sample of 16,000 address-matched cases were selected and surveys were mailed to those households. A total of 2,370 surveys were returned.

The primary purpose of the survey was to determine the origins and destinations of those surveyed, and to use that information to test the validity of the model that the study used to determine traffic flows throughout the study area. However, the survey was also an opportunity to poll those surveyed about issues that could help the committee understand how the public would react to various alternatives being considered. The survey consisted of 20 questions – 12 directly related to the origin and destination survey – and eight probing how the respondent viewed their trip's route safety, reliability and congestion, what they usually do to deal with traffic congestion on their usual route, how many times a week they take an alternate route to avoid traffic congestion, which route they use as an alternate, whether their employer offers a benefit to encourage a reduction in commuter trips, and whether or not the respondent participates and why.

The results of the Origin and Destination Survey are provided in Appendix 8.

9.7 Trans-Lake Washington Community Survey

Over the course of 10 days in late May 1999, a random telephone community survey was conducted to assess two primary issues uppermost in the Study Committee member's minds – the community's perspectives on Trans-Lake area traffic-related problems, and the degree of favorableness toward the various transportation improvements under consideration. Appendix 7 includes a report on survey methods and results. Specifically, the survey addressed the following:

- Perceived significance of the problem
- Travel frequency and most typical mode of transportation
- Purposes of trips
- Favorableness toward transportation improvement options
- Likelihood to use transportation improvement
- Values influencing decision-making of most favored transportation improvements

Phone interviews were done with 1,068 people who reside within the Trans-Lake Washington Study Area. To obtain the most representative sample, telephone numbers were randomly selected in proportion to households within 39 zip codes of the study area.

Respondents were asked how frequently they use I-90, SR 520, and SR 522. Approximately 10 percent stated that they use I-90 on a daily basis; 9 percent use SR 520 daily; and 4 percent use SR 522 daily. On average, most users travel along these routes 1 to 3 times per month or less. When asked to choose which of the three corridors they use most frequently, 50 percent of respondents indicated I-90, 39 percent indicated SR 520 and 7 percent indicated SR 522. (Nearly 4 percent are non-users.) The two most common reasons for using the route they travel most frequently are recreation/social activities and errands/shopping. 29 percent use their corridor to commute to work. Nine out of 10 corridor users travel in a passenger vehicle. One-fourth of these people report that they travel in HOV (carpool) lanes. Local streets were the most common access route.

A key goal of the survey was to assess the community's perception of the six elements of the problem as defined by the committee. Respondents were asked to rate the significance of traffic congestion, roadway safety, travel reliability, integration of land use and transportation planning, environmental impacts, and noise and other impacts to neighborhoods and businesses. Traffic congestion was seen as the most serious problem.

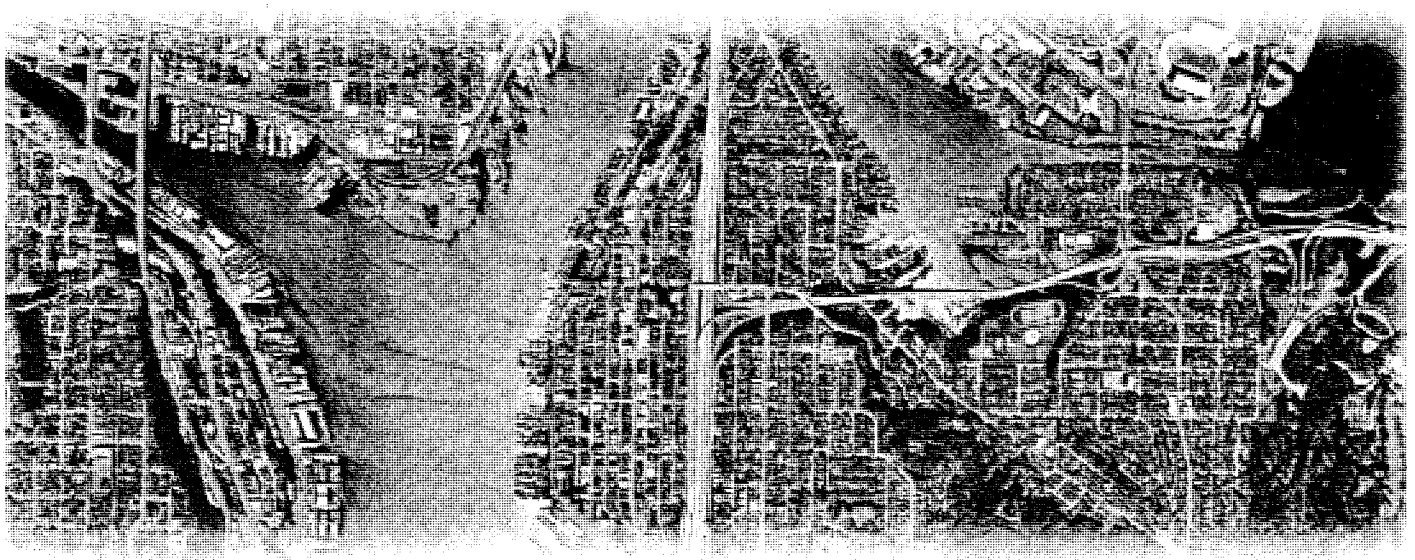
Asked to rate the various alternatives being considered by the committee, no change and tolls received the lowest rating, with the highest support for rail, with expanded bus and more general-purpose lanes following closely behind. When respondents were asked to select one improvement as their most favored, 38 percent chose rail, and 21 percent chose more general-purpose lanes. The least favored improvements were tolls (20 percent) and additional HOV lanes (14 percent).

The survey also asked respondents to rate the aspects people consider important when making choices about transportation improvements. The top three factors (rated higher than cost and least impact to the environment and neighborhoods) were:

- Allows for the movement of the most people
- Improves travel time
- Provides a choice other than a passenger vehicle

Trans-Lake Washington Study

Appendices



Appendices

Trans-Lake Washington Study

Appendix A
Committee Meeting Summaries

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MUSEUM OF HISTORY AND INDUSTRY, SEATTLE
MAY 27, 1998 1:00 P.M. TO 4:00 P.M.

SYNOPSIS OF MEETING

The Trans-Lake Washington Study Committee held its first meeting on May 27, 1998, at the Museum of History and Industry in Seattle. The Study Committee first heard from Sid Morrison, Secretary of the Washington State Department of Transportation (WSDOT), on the current problems being faced by the region and the Committee's charge to agree on a set of reasonable and feasible solutions that will address the growing congestion, population, and development, and transportation impacts on communities.

Renée Montgelas, WSDOT's director of the Office of Urban Mobility, also briefed the Study Committee on the discussions and agreements leading up to the start of the Trans-Lake Washington Study Committee. Elected officials, public agencies, and corridor interest groups have committed to working together. Continued support throughout the process and for the agreed-upon set of solutions will be critical to moving the process forward after the Study Committee completes its work.

Draft committee ground rules, highlights from member interviews, a proposed approach for the Committee's activities, and plans for subsequent meetings were all discussed. The group formed roundtables to discuss the constituencies each member represented and the top three problems and interests of that constituency. The most frequently mentioned problems included cut-through traffic, noise pollution, air pollution, congestion, regional growth, and impacts on neighborhoods. The most frequently mentioned interests included mobility (freight and people), accessibility, land use and growth management, congestion reduction, and better use of transportation alternatives.

HISTORICAL CONTEXT AND CHARGE TO COMMITTEE

Sid Morrison, Secretary of the Washington State Department of Transportation (WSDOT) provided the historical context of Trans-Lake mobility to the Study Committee. The area north of I-90 on Lake Washington has not had a plan for handling current and future capacity. With the leadership of the Study Committee, he expects breakthroughs to begin to answer those questions. WSDOT has no preconceived notions about the outcome of the process and pledges to support the Study Committee by providing the group with all of the agency's resources and information. As the Study Committee reviews facts, figures, and current conditions, the represented interests will talk with each other and work together towards mutually agreeable reasonable and feasible solutions. The commitment of time by all members is greatly appreciated and that commitment and a successful process will affect the entire state.

Current problems are a result of many issues, including a growing population, growth on the east side of the lake, and increased congestion. A change in culture has increased the number of average miles traveled by people, while the infrastructure has not kept up with that growth. There has been a dramatic increase in the number of lanes in the 1930s and 1940s, and there has been no increase since. SR 520 is currently experiencing seven hours of congestion every day. The problem is no longer only people living on the east side and driving to Seattle to work; there is almost an equal volume of traffic coming from Seattle neighborhoods to work on the east side of the lake. There also need to be reliability and continuity in the transportation system, including shoulder space for cars that break down on SR 520. Another part of the problem is that while half of the people crossing the SR 520 bridge do so in carpools and buses, when they reach the west approach to the Evergreen Point Floating Bridge, they have to merge with the single-occupancy vehicles and congestion.

Neighborhood impacts remain a major concern; a great deal of distrust remains from when the SR 520 bridge was built. If more cars travel across SR 520, then the noise from the freeway increases. If SR 522 gets backed up with traffic, those neighborhoods are also impacted. The region has become increasingly sensitive to any type of road expansion where the environment might be impacted. The challenge for the Study Committee is to reach agreement on a product which includes a set of reasonable and feasible solutions in an environment where the represented interests talk to each other and respect other opinions.

Renee Montgelas, WSDOT, was introduced as director of the Office of Urban Mobility (OUM) and provided a brief overview of the history of the Trans-Lake Washington Study and the expectations as work is begun. There has been growing recognition that cross-lake and north end travel is getting worse and will not go away by doing nothing. Over the past year and a half, Renee and John Okamoto of WSDOT's Northwest Regional Office have been meeting with the interests on cross-lake travel to reach agreement on what would be an acceptable approach for addressing cross-lake issues. Many of the groups opposed to studying SR 520 decided during that process that it was in their interest to be part of the solution.

Local officials on both sides of the lake are also encouraging the process to move forward. Key legislators helped WSDOT get funding for the study, federal funds were received, and the state transportation commission endorsed the study, as did the Regional Transit Authority/Sound Transit and Puget Sound Regional Council. While it has taken awhile to get to the point of the first Study Committee meeting, the hard work is really just beginning. WSDOT is not presuming to have any solutions. The promises that have been made on how the study will be conducted and how reasonable and feasible solutions will be reached include looking at all solutions, all potential routes, and integrating into the solutions measures that help reduce or lessen the impact of regional transportation on communities. There is no single solution and every solution will have its limits. There will need to be a variety of tools used to address the current transportation problems.

Some of the issues to be addressed by the Study Committee are larger than the problem being studied. For example, there is fundamental disagreement on whether new transportation facilities make congestion better or worse. Also, neighborhoods must be responded to fairly to address the impacts of traffic; I-90 set a high standard for mitigation. It is difficult to see what the result of the Trans-Lake Washington Study will be, but everyone is motivated to come forward with some resolution that shows motion. Technical consultants have been hired to help address questions that come up throughout the process, such as what will be the impact of more cars traveling across the lake on the regional transportation system.

It will be necessary to get solid agreement from the interests represented at the table for the set of alternatives in order to obtain implementation funding. Consensus among a wide range of interests is a good argument for moving a proposal through the Legislature. The task of the group is to find a set of reasonable and feasible solutions that will be widely acceptable to the represented interests. The group also has the opportunity to take potential solutions off the table based on the criteria adopted. WSDOT will have two roles in this process: as owner and operator of some of the major transportation facilities, the agency has a vested interest in the work and holds a seat at the table for that reason. OUM will also be providing support for the committee as well as overall coordination for the study. Rob Fellows will be serving as project manager from OUM. Pat Serie of EnviroIssues will be facilitating the Study Committee and Jeff Peacock of Parametrix is project manager for technical work and public involvement, with Doug Hurley of CH2M Hill as deputy project manager.

DRAFT GROUND RULES

Pat Serie introduced draft ground rules for how the Study Committee may choose to operate for the next several months. They include full participation by members, time set aside for public comment, striving for consensus, meeting summaries produced and distributed, keeping an open mind, respecting each

other's opinions, and addressing issues brought up by study committee members. Based on interviews with most of the committee members (to be continued), it has been felt that a decision on election of a chair should be postponed until the Study Committee receives information on the existing conditions and develops a problem statement.

IDENTIFYING MEMBERS' CONSTITUENCIES AND PROBLEM AREAS

The Study Committee broke into small groups to identify on a map the area of the constituency represented by each of the members and to identify, as a starting point for discussion, three major issues affecting that constituency. The roundtable discussions, which were reported back to the whole committee, are summarized in Attachment 1.

KEY MESSAGES FROM INTERVIEWS

Pat Serie provided a synopsis of the member interviews conducted by her and Rob Fellows. There are many common interests represented on the committee. Everyone said that 45 members were too many, but agreed that there were a lot of problems to be addressed and a lot of interests impacted by those problems. There is a bias towards solving the problem. Major differences between members included those who believe alternatives to driving need to be maximized before new general-purpose highway capacity is added, and others who believe we are past the point where new highway capacity is needed today. Environmental stewardship is very important to many members, and there is a focus on mitigation. Policy issues decided on by the Study Committee will need to be technically sound. Trust is an issue for all the members, but everyone is willing to talk to each other. The group will not be broken into smaller groups (e.g. subcommittees) until there is an agreed upon need. There is support for alternating between meeting locations as well as involving the public in the study.

PROPOSED ROADMAP FOR STUDY COMMITTEE

Rob Fellows, WSDOT, described to the Study Committee a proposed draft of a "road map" that the group may follow as it defines the problem, develops criteria to measure potential solutions, and comes to agreement on a set of reasonable and feasible alternatives. The proposed road map is just one way that the group can get to a set of reasonable and feasible alternatives and is open to suggestions and changes from the Study Committee. It will probably evolve and change over time as the process moves forward. The scope of work for the technical consultants is flexible so that the Study Committee can determine what type of information it needs. The first stage of the project is proposed to focus on developing a problem statement, translating the interests around the table into a set of criteria, and determining what type of evaluation model will be used. The next stage will identify a broad set of alternatives including all mobility solutions, demand management concepts, and mitigation. The final stage will combine the most promising solutions into a set of feasible and reasonable solutions for which a thorough analysis can be conducted.

Dan Becker, Points Communities, questioned whether an origin and destination study is included in the proposed road map. Rob responded that the details of each step in the process are not currently included in the road map. Specific technical tasks, such as an origin and destination study, should be compared to the criteria that the Study Committee will develop to see how it will help with the selection of alternatives. Dan supports an origin and destination study. Virginia Gunby, 1000 Friends of Washington, suggested that the Study Committee should review the LUTRAC study completed in Oregon which looked at how alternative modes and pricing alternatives can lead to trip reduction. Paul Cowles, North Lake Business, recommended that the public get involved early in the process and that the Study Committee should include the City of Kenmore as a member. He also advocated hearing from representatives of different neighborhoods in the study area rather than taking a bus tour of the study area.

Maggi Fimia, King County, suggested that agreement on interests and principles should come before the problem statement development. Eugene Wasserman, Seattle Business, requested basic background information on transportation concepts, such as carrying capacity and pollution rates, so that everyone has a common understanding. Bob Gillespie, Eastside Business, questioned where the phrase "reasonable and feasible solutions" originated. Rob responded that the phrase was used in legislation establishing the study and a failed budget proviso. Donovan Tracy, Eastside Business, suggested that there needs to be enough time to conduct primary data collection. Ward Truess, Eastside Transportation Committee, questioned whether existing computer models could be used to analyze current conditions. Janet Ray, AAA, suggested that relevant information from the SR 405 corridor committee should be considered by this study committee.

A revised draft of the road map, showing more detailed information for each step in the process, will be distributed prior to the next meeting. Any comments before then should be directed to Rob Fellows. The Study Committee will be asked to tentatively approve the road map at its next meeting with the understanding that it might change as the process moves forward.

PLANS FOR NEXT MEETING

The agenda for the next meeting will include looking at existing conditions, adoption of ground rules and road map, and defining of the problem statement and criteria. It will be held on July 1 from 1:00 to 4:00 p.m. location to be announced. The Study Committee agreed to meet on the first Wednesday of every month. The Study Committee members also agreed to attend an optional bus tour of the study area which will be held on two alternatives days, June 26 from 9:00 a.m. to 12:00 p.m. or June 29 from 1:00 p.m. to 4:00 p.m. Registration forms should be returned to the facilitation team by June 12.

PUBLIC COMMENT

No public comment was received.

MEETING HANDOUTS

- Agenda
- Draft Ground Rules
- Interview Highlights
- Study Area Tour Invitation
- Proposed Meeting Schedule
- Draft Road Map

MEETING ATTENDEES

Members

• Nancy Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of 520
• William Backlund	Washington Legislature
• Doug Baker	Washington Trucking Association
• Dan Becker	Points Communities

• Richard Conlin	City of Seattle
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Mike Creighton	City of Bellevue
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Mary Gates	Sound Transit
• Bob Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Jim Horn	Washington Legislature
• Rosemarie Ives	City of Redmond
• Doug Jacobson	City of Lake Forest Park
• Anne Knight	ALT-TRANS
• Jean Leed	Seattle Neighborhoods
• Richard McIver	City of Seattle
• Rob McKenna	King County
• Barry Murphy	Eastside Business
• Phil Noble	Eastside Neighborhoods
• John Okamoto	Washington Department of Transportation
• Peter Orser	City of Mercer Island
• Doug Pullen	Highway Users Association
• Rick Pusateri	Eastside Business
• Janet Ray	AAA
• Phil Rourke	Point Communities Neighborhoods
• Scott Rutherford	University of Washington
• Cynthia Sullivan	King County
• Donovan Tracy	Eastside Business
• Debbie Treen	City of Bothell
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business

Alternates

• Susan Baker	Seattle Neighborhoods
• Richard Conrad	City of Mercer Island
• Tye Ferrel	City of Seattle
• Ken Jacobsen	Washington Legislature
• Kingsley Joneson	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Ed Murray	Washington Legislature
• Connie Niva	Washington Transportation Commission

- Nic Rossouw — Seattle Neighborhoods
- Dave Russell — Puget Sound Regional Council
- Noel Schoneman — City of Seattle
- Doug Schulze — Points Communities
- Ed Switaj — City of Seattle
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of 520

Public, Staff, Media

- Jim Arndt — City of Kirkland
- Jackie Branz — Office of Senator Thibaudeau
- King Cusheman — Puget Sound Regional Council
- Gil Eade
- David Hull — King County Department of Transportation
- Rick McKinney — City of Shoreline
- Chuck Mize — King County Executive Office
- Thomas Murgen — City of Medina
- Vicki Read — Seattle Business
- Karen Reed — City of Bellevue
- Chris Rose — Washington Transportation Commission
- Ed Rose — EMRA, Inc.
- Ken Schram — KOMO TV
- Mike Ullmann — Eastside Journal
- Peyton Whitley — Seattle Times

ATTACHMENT 1

TRANS-LAKE WASHINGTON STUDY COMMITTEE PROBLEMS AND INTERESTS

PROBLEMS

- air pollution (3)
- backup of traffic into neighborhoods (2)
- congestion (2)
- congestion in University District/ Montlake
- cut-through traffic (5)
- environmental impacts (2)
- environmental impacts of expansion
- geography
- I-5 backups
- impact on businesses
- lack of bicycle access
- loss of productivity
- mobility/congestion
- neighborhood impacts (2)
- neighborhood traffic
- noise from SR 520
- noise pollution (7)
- population/regional growth (2)
- regional and Eastside congestion
- specific neighborhood impacts
- traffic congestion on arterial
- water pollution
- water run-off pollution

INTERESTS

- access between employment centers
- access to transit
- accessibility (2)
- air quality
- alternative transportation modes
- business impacts
- capacity
- changing modes
- commuting during the day
- compatibility with plans
- connections with regional transportation
- cost (2)
- customer access
- drainage (2)
- efficiency
- elimination of congestion
- emergency services
- employee mobility
- employee recruitment
- energy
- environment
- finding a solution that strikes a balance
- freight and business mobility (6)
- getting to jobs on either side of the lake
- getting transit to operate better
- goods and people mobility
- growth management (3)
- keeping the city livable
- land use (2)
- long-term solutions
- markets
- minimizing neighborhood impacts
- mitigation
- mitigation for past and future impacts
- mobility (6)
- mobility alternatives impact on congestion and transit
- product delivery
- public involvement
- reduce pollution
- reduce congestion around residences (2)
- sustainability (2)
- system continuity and effectiveness
- transportation systems
- well-being of employees
- wetlands/nature preserves (2)

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
LAKE WASHINGTON SCHOOL DISTRICT RESOURCE CENTER, REDMOND
JULY 1, 1998 1:00 P.M. TO 4:30 P.M.

SYNOPSIS OF MEETING

The Trans-Lake Washington Study Committee held its second meeting at the Lake Washington School District Resource Center in Redmond on July 1. The meeting had several objectives, including receiving information on the existing conditions of traffic and growth in the Puget Sound region, identifying areas where the Committee would like more information, completing brainstorming of Trans-Lake problems and interests of individual members, reviewing a revised draft of a proposed study process, reviewing proposed ground rules, and providing input to a proposed public involvement plan.

The central Puget Sound region is experiencing rapid population and employment growth. This growth, combined with increased travel per capita, has led to increased traffic on the roadways. Vehicle miles traveled have shown a six-fold increase over population growth and 150 percent growth over employment. One cause of this has been the growing distance between housing and employment centers and the increase of dual-income families. The Study Committee spent time identifying additional information it will need as the study moves forward.

The proposed public involvement plan was introduced to the Study Committee. Its target audiences include the general public, daily commuters, community groups in the study area, communities in the study area, special interest groups, and major employers. These groups are proposed to be reached through monthly mailed updates, an Internet web site, public workshops, a telephone hotline, and public comment periods at the Study Committee meeting. The Study Committee will continue to review the public involvement plan and provide input to the technical consultants.

The next Study Committee meeting will be held on August 5 from 1:00 to 5:00 p.m. at the King County Regional Library, 1111 110th Avenue NE, Bellevue.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, introduced new members Representatives Ken Jacobsen and Ed Murray, and Jim MacIsaac as an alternate for Ward Truess, Eastside Transportation Committee. Doug Hurley, CH2M Hill, provided a brief summary of the tours of the study area which were attended by approximately 40 Study Committee members and alternates. Each tour took members on the major highways and arterials throughout the study area to provide a common understanding and first-hand experience of the congestion and development occurring. A tour packet was prepared as well which included a map of the tour route and profiles of the neighborhoods included in the study area. It was provided at the meeting to members and alternates not attending one of the tours.

TRANS-LAKE "TRANSPORTATION 101"

Jeff Peacock, Parametrix, project manager for the technical and public involvement consulting team, presented an overview of existing conditions in the study area, including population and employment growth and areas of congestion. The information presented was compiled from a variety of sources, including the Washington State Department of Transportation (WSDOT), Puget Sound Regional Council (PSRC), and local government agencies.

Based on data from 1995, regional population and employment has grown tremendously in the past 30 years, but has been concentrated in the suburban areas; growth in the central cities (e.g., Seattle, Tacoma) has not been substantial. As a result, people are now driving further to work and it is more common to have two persons per household in the work force, for an average of 4.5 daily trips per capita. Vehicle miles traveled have shown a six-fold increase over population growth and a 150 percent growth over employment. The proportional number of transit riders has decreased (total transit ridership has increased). Almost all of the roadway network in the system experiences congestion for 3-5 hours every afternoon with several hotspots of more than 5 hours of congestion.

Many people use transit to cross the lake. Ridership dramatically drops, however, in the eastern part of the corridor. The volume of traffic has increased on SR 520 and I-90, while remaining relatively the same on SR 522, with an overall traffic increase of nearly 150 percent over 20 years to about 300,000 vehicles per day. Peak traffic now sees reverse commutes, with as many commuters in the morning eastbound from Seattle as in the afternoon. Half of the people moving westbound on SR 520 across the lake in the morning are carried by 11 percent of the vehicles.

The technical team is in the process of compiling additional information on current highway operations, existing geometric deficiencies, safety based on accident locations, arterial relationships to the Trans-Lake corridors, and sensitive areas. Comprehensive plans will be reviewed for information on future growth, acknowledging the many assumptions that are used in those projections. During the August Study Committee meeting, this information will be reviewed during a presentation of corridor characteristics.

ROUNDTABLE Q&A ON TRANS-LAKE TRANSPORTATION 101 AND IDENTIFICATION OF GENERAL TOPICS FOR FUTURE LEARNING

The Study Committee formed roundtables to discuss the information presented on existing conditions and brainstorm additional information that would be helpful in providing the group background information. The topics raised will be used by the study team to structure informational presentations at future Committee meetings.

SO WHAT IS THE PROBLEM, ANYWAY? AND WHAT ARE OUR INTERESTS IN SOLVING IT?

Pat Serie reminded the Study Committee of the roundtable discussions held at the last meeting to identify problems and interests of the members. A summary of the problems and interests identified was distributed to the group following the last meeting, and additional time has been set aside to review that summary and determine if there are additional items to be added. After roundtable discussions, the Study Committee members reported back on additional problems and interests. The problems identified will be used by the technical team in drafting a problem statement for review at the next meeting.

THE EVOLVING ROADMAP

At the previous meeting, the Study Committee was provided a proposed road map of the study process. Based on input from that meeting and additional work by the technical team, Rob Fellows, WSDOT's project manager, presented a revised proposed road map. Several assumptions are made in the roadmap, including that the problem statement and interests of the Study Committee will drive the definition of the technical work program and development of evaluation criteria. Mitigation, neighborhood enhancements, bicycle and pedestrian features, and transportation demand management, will be integrated into proposed solutions. Lastly, no major decision will be made without first being introduced to the Study Committee at a previous meeting.

Over the next 4 months, the problem statement will be developed along with the evaluation method (i.e. how the process will move from general principles to specific solutions) and specific criteria. The next phase will include developing and evaluating a range of concepts to improve the situation. Brainstorming by the Study Committee and ongoing public involvement efforts will help develop the first list of alternatives. In November, the first screening of alternatives will take place to eliminate proposals that do not warrant further consideration. Between December and February, technical findings will be reported back to the group and then solutions that appear promising will begin to be combined together, such as mobility concepts and potential enhancements. There will then be another process of identifying outstanding questions that have not been addressed and finally reaching agreement on three to four solutions.

Some Study Committee members questioned whether the work laid out could be accomplished in the next twelve months. Rob Fellows noted that there is a request from the Transportation Commission to complete the study by July 1999 so as not to take additional time studying the problem or take up valuable time of Committee members. A suggestion was made that more frequent meetings could be held near the end of the process in order to have sufficient time to exchange ideas and discuss potential solutions. Also, several people felt that the technical staff should present more information for Study Committee review rather than having all of the material, such as problem statement and evaluation criteria, developed by the Committee. After further discussion, it was agreed that there will probably be a mixture of staff-produced documents and information developed by the Committee.

GROUND RULES

At the May 27 meeting, a proposed set of ground rules was discussed by the Study Committee. Since that time, a number of suggestions have been made for changes to the ground rules. Those changes included:

1. Role of the technical consultants with the Study Committee, including ensuring that there are funds available during the end stage of the project, maintaining flexibility and input by the Study Committee in the work being performed by the technical consultants, and reviewing a monthly progress report of the technical activities performed during the previous month.

2. Participation of alternates in the Study Committee (agreement reached to continue current policy).

3. Time for public input at the beginning and/or end of each Study Committee meeting.

4. Clear definition of consensus with consideration of a need for greater-than-majority decision process as a backup. Specifics of that decision process will be agreed upon later in the process.

5. Required minimum level of attendance to maintain participation in the Study Committee.

6. Meeting summaries prepared; Study Committee members may point out inaccuracies and they will be revised; there will be no formal transcript of the meeting nor will there be a formal review and acceptance of the summaries.

The proposed changes as discussed will be incorporated into the ground rules and distributed to Study Committee members in advance of the next meeting at which time they will be asked to adopt them.

ELEMENTS OF AN EVALUATION METHOD AND CRITERIA; HOMEWORK ASSIGNMENT TO TRANSLATE INTERESTS INTO CRITERIA

Pat Serie explained that the next step for the Study Committee will be to begin developing evaluation criteria by which potential solutions can be measured. The interests suggested by the Study Committee will help develop those criteria. There can be several types of criteria, such as fatal flaw, preference, and avoidance. Each of the criteria has to be measurable in some way; it cannot be a vague principle. A homework sheet was distributed to the Committee members on which they could practice turning their interests into measurable criteria. At the next meeting, agenda time will be set aside for a more extensive exercise.

PUBLIC INVOLVEMENT

Lorie Parker, CH2M Hill, briefed the Study Committee on the proposed public involvement approach which was provided to the group in advance of the meeting. The goal of the public involvement plan is to provide a broad level of public input to the Study Committee. The public will be informed regularly about crucial points in the process so they can choose to become involved and will support the Committee's ultimate recommendations. Core constituencies that will be contacted include the general public, daily commuters, community groups in the study area, communities in the study area, special interest groups, and major employers. The strategies to reach these groups include public comment periods at Study Committee meetings, monthly mailed updates, an Internet web site, and a telephone hotline.

A one-page monthly update would describe what occurred at the previous Study Committee meeting, upcoming issues, and information on the next meeting. The public involvement team would also provide support to the Study Committee members in reporting back to their constituencies or meeting with other interest groups. This support might include preparation of presentations and assistance summarizing input. A web page is being developed and all documents distributed to the Study Committee will be placed on that page. It will require little or no maintenance other than document posting once it is designed and programmed. Public workshops will be held in September and February, as well as public outreach. Opinion polling and focus groups may be used at key points. The workshops will be held prior to the finalization of evaluation criteria and agreement on a set of reasonable alternatives. Also, the Study Committee will be provided with regular updates of what public involvement activities have occurred and what input has been received.

The following suggestions and input were provided by Study Committee members:

- Limit time of public comment to two to three minutes per person.
- The problem statement should be completed before it is provided to the public.
- Congressional representatives should be kept aware of the project so they can provide assistance in getting federal funding for the solutions.
- Study Committee members meeting with constituencies should provide feedback to the entire Committee on the input they received.
- Study Committee members should receive media clippings.

- Public involvement should continue after the Study Committee agrees on a set of solutions.

- Information is needed on the estimated cost and products of the proposed public involvement activities.

Additional input should be sent to Lorie Parker by July 20. (phone 425-453-5000; fax 425-462-5957; e-mail lparker1@ch2m.com)

PLANS FOR NEXT MEETING

The agenda for the next meeting will include reviewing a draft problem statement, turning interests into evaluation criteria, more specific background on the Trans-Lake corridors, specific discussion of public workshops to be held in September, and adoption of ground rules. It was agreed that the Study Committee would extend its meeting time from 1:00 p.m. to 5:00 p.m. A meeting schedule, including locations, was distributed to the Study Committee and is as follows:

August 5, 1998	September 2, 1998
1:00 to 5:00 p.m.	1:00 to 5:00 p.m.
King County Regional Library	Lake Washington School District Resource Center
1111 110th Avenue NE	16250 NE 74th Street
Bellevue	Redmond

If Study Committee members are unable to attend a meeting, they should contact Pat Serie or Amy Grotefendt, EnviroIssues, at 206-269-5041.

PUBLIC COMMENT

No public comment was received.

MEETING HANDOUTS

- Agenda
- Regional Background and Context Presentation
- Proposed Ground Rules
- Proposed Draft Roadmap
- Criteria Development Homework

MEETING ATTENDEES

Members

• Nancy Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• William Backlund	Washington Legislature
• Dan Becker	Points Communities
• Richard Conlin	City of Seattle
• Paul Cowles	North Lake Business

- Aubrey Davis — Washington Transportation Commission
- Margaret Doman — Eastside Neighborhoods
- Bob Edwards — Puget Sound Regional Council
- Maggi Fimia — King County
- Nona Ganz — City of Kirkland
- Peggy Gerdes — North Lake Neighborhoods
- Bob Gillespie — Eastside Business
- Virginia Gunby — 1000 Friends of Washington
- Tom Heller — Seattle Neighborhoods
- Rosemarie Ives — City of Redmond
- Doug Jacobson — City of Lake Forest Park
- Anne Knight — ALT-TRANS
- Jean Leed — Seattle Neighborhoods
- Richard McIver — City of Seattle
- Rob McKenna — King County
- Phil Noble — Eastside Neighborhoods
- John Okamoto — Washington Department of Transportation
- Peter Orser — City of Mercer Island
- Doug Pullen — Highway Users Association
- Rick Pusateri — Eastside Business
- Janet Ray — AAA
- Scott Rutherford — University of Washington
- Cynthia Sullivan — King County
- Donovan Tracy — Eastside Business
- Debbie Treen — City of Bothell
- Ward Truess — Eastside Transportation Committee
- Mark Weed — Seattle Business

Alternates

- Susan Baker — Seattle Neighborhoods
- Alan Borning — ALT-TRANS
- Madeline Cleman — Eastside Neighborhoods
- Tye Ferrell — City of Seattle
- Roy Francis — King County
- Connie Marshall — City of Bellevue
- Ed Murray — Washington Legislature
- Dave Russell — Puget Sound Regional Council
- Noel Schoneman — City of Seattle
- Doug Schulze — Points Communities
- Larry Springer — City of Kirkland
- Cynthia Sullivan — King County
- Ed Switaj — City of Seattle
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of 520

Seats Not Represented

• Barry Murphy	Eastside Business
• Eugene Wasserman	Seattle Business
• Damon Caldwell	Seattle Neighborhoods
• Mary Gates	Sound Transit
• Jim Horn	Washington Legislature
• Ken Jacobsen	Washington Legislature
• Doug Baker	Washington Trucking Association

Public, Staff, Media

• Jim Arndt	City of Kirkland
• Pete Beaulieu	Puget Sound Regional Council
• King Cushman	Puget Sound Regional Council
• Roy Enberg	
• Jim Hill	Microsoft
• Terry Marpert	City of Redmond
• Leonard Newstrum	City of Yarrow Point
• Karen Reed	City of Bellevue
• Sabina Silver	Bellevue Chamber of Commerce
• Betty Spieth	Kirkland Chamber of Commerce
• Chris Townsend	King County Council

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
KING COUNTY REGIONAL LIBRARY, BELLEVUE
AUGUST 5, 1998 1:00 P.M. TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

The Trans-Lake Washington Study Committee held its third meeting on August 5 at the King County Regional Library in Bellevue. Pat Serie, EnviroIssues, introduced two new members of the Study Committee who will be replacing existing seats: Jim Hill representing Eastside businesses and Raleigh Watts representing Seattle neighborhoods. She described the agenda and expected outcomes for the meeting. Pat reported that several committee members have suggested that the group spend time in informal discussion of specific topics, including transportation demand management, bridge condition, and an O/D survey. Opportunities for the Study Committee to discuss these and other issues will be provided at members request, separate from the meetings of the Study Committee. She noted some topics, such as the condition of the SR 520 bridge, might be more appropriately discussed during concept identification at the September or October meetings.

Due to difficulty in booking suitable facilities, the Study Committee has been meeting on the east side of the Lake. The next meeting will be held on September 2 at the Lake Washington School District Resource Center in Redmond. Starting in October, however, meetings will be scheduled on the west side. Based on a polling of members, the Study Committee will continue to meet on the first Wednesday of every month and locations will be moved around to provide a regional balance.

COMMITTEE STRUCTURE

Dan Becker, Points Communities, reported that he and several other committee members believe it is time for the Study Committee to select a chair. This would accomplish several things including giving the Study Committee more control over its agenda and the type of information being presented. Nona Ganz, City of Kirkland, also expressed concern that the Study Committee is not being presented with enough or the right type of information. Ed Murray, Washington Legislature, suggested that some frustration is being felt because the process is not moving fast enough into discussing actual solutions, and suggested a u-shaped table format to enable face-to-face discussion.

Pat noted that the Study Committee is moving through a step-by-step process of identifying problems, interests, and criteria, and that is resulting in a deliberative process before identifying potential solutions. During interviews with individual members, many felt that postponing the election of a chair was appropriate. It was the sense, however, that it will be difficult to select one person who represents the broad range of interests at the table. A potential alternative would be to select a steering committee to assist in the development of agendas and presentations. Donovan Tracy, Eastside Business, suggested that the steering committee could have a rotating membership and agreed with the difficulty involved in selecting a single person to serve as chair.

Mike Creighton, City of Bellevue, questioned how the steering committee would be selected. Jim Horn, Washington Legislature, asked whether the steering committee would operate on consensus. Margaret Doman, Eastside Neighborhoods, suggested that co-chairs might be an option for committee leadership. After agreement by the Study Committee, Pat agreed to outline different options for committee leadership, including a chair, co-chairs, a steering committee, and the status quo, and distribute it for review and action at the September meeting.

Maynard Arsove, No Expansion of 520, requested that full meeting minutes be provided. Pat noted that this was discussed at the last meeting and members felt that full verbatim minutes were not necessary, but left it open for revisiting. Also, it was agreed, and incorporated into the proposed ground rules, that members could correct inaccurate statements in the meeting summaries. Paul Cowles, North Lake Business, suggested that meeting minutes are not necessary until the Study Committee begins making decisions on potential solutions, such as what concepts should continue to be considered. Virginia Gunby, 1000 Friends of Washington, noted that any decisions made should be clearly documented in the meeting summary. Dan Becker suggested that the meeting summaries could include more detailed description of the meeting discussions, but not be a complete transcript. The facilitation team agreed to do so.

PUBLIC COMMENT

Alan Borning noted that an alternative version of the problem statement had been distributed to the Study Committee for discussion during the roundtables. It was prepared by members of ALT-TRANS and 1000 Friends of Washington.

WHAT IS THE PROBLEM WE ARE SOLVING?

Jeff Peacock, Parametrix, project manager for the technical and public involvement consulting team, provided a brief overview of a proposed draft problem statement (distributed in advance for review). The draft incorporated problems identified by members during roundtable discussions at the previous two meetings. The goal of a problem statement is to clearly define the problems to be solved and maintain the focus of the Study Committee over the next year. This problem statement could also serve as the basis for any needed environmental documentation based on the committee's recommendations. To accomplish both those objectives, the draft problem statement outlined a series of unprioritized and objective statements about existing conditions.

The Study Committee formed roundtables to discuss the draft problem statement and suggest problems that were not included or identify statements that did not reflect problems. Proposed conceptual changes were presented to the entire group, and detailed suggestions documented. The technical and public involvement consulting team will incorporate the proposed changes and provide a revised draft to the Study Committee in the next mailing. The revised draft will be reviewed at the September meeting and accepted as a review draft prior to the public workshops. The comments heard during the roundtable discussions will be summarized in an annotated problem statement and provided to the Study Committee prior to the September meeting.

WHAT'S GOING ON IN THE CORRIDOR TODAY?

As part of a continuing series of presentations of background information, Jeff Peacock briefed the committee on the current situation within the study area, focusing on freeway and arterial corridors, including HOV lanes, transit facilities and services, and bicycle and pedestrian facilities. Jeff noted that the consulting team is in the process of summarizing available information on study area conditions which will be provided to the Study Committee next month.

Demand continues to increase in the Trans-Lake corridor, with a doubling in traffic volumes over the last 12 years. The I-90 bridge continues to see a disparity between the west and eastbound commutes while 520 shows heavy volumes traveling both directions. There are several ways to measure traffic performance, including level of service, volume-to-capacity, and lane occupancy. The level of service is measured on a grading system of A to F, with A being free flowing and F very congested. Volume-to-capacity is measured on highway corridors at a single location with arterials measured at intersections.

Lane occupancy is a new term in transportation planning and refers to the number of cars in a lane; for example, 100 percent lane occupancy would constitute bumper-to-bumper traffic.

When traffic volumes approach the capacity of a facility, unstable traffic flow results and the slightest disruption can result in a traffic jam. On both SR 520 and I-90, the roadway currently reaches unstable traffic flow during commute hours. Responding to a question from Dan Becker, Jeff noted that the traffic volume figures were collected by the Washington Department of Transportation. Dan questioned the accuracy of the figures, specifically on SR 520 near 92nd Avenue NE. He believes eastbound traffic is free flowing in the morning and evening and does not appear to be reaching the unstable traffic flow as noted in the graphs. Further information on existing volumes will be provided and clarified for the committee.

Jeff presented alternative ways to measure traffic volumes, including general and HOV lane efficiency, transit usage and frequency, and person throughput. For example, on I-90, general purpose lanes carry approximately 2000 cars holding the same number of persons in morning westbound traffic. HOV lanes carry approximately 600 cars and hold 1200 persons. On SR 520, general purpose lanes carry approximately 1800 cars and slightly more people at the same time and direction. HOV lanes carry 400 cars and buses and over 4000 people. There are no new planned HOV lanes in the Trans-Lake area; HOV lanes on SR 520 from SR 405 to SR 202 are under construction and HOV lanes on SR 405 are being moved to the inside of the freeway.

When looking at transit usage, it is important to note that the type of usage differs from corridor to corridor. For example, SR 522 transit is used more for local circulation rather than traveling to other areas of the region. Park and rides are located along most of the major corridors; however, transit centers are not always adjacent to the park and rides. Dan Becker requested information on whether park and rides closer to bridges are being used with more frequency than those farther away.

The region's transportation demand management system sought a 15 percent reduction in single-occupancy vehicles by 1995; the goal increased to 25 percent in 1997. Information will be provided about performance against those goals. Strategies that are being used by employers include the flex pass system, telecommuting, car and van pools, parking policies, and biking and walking. Jeff will report back to the Study Committee on whether the reduction in single-occupancy vehicles incorporates population growth. A map of ongoing studies within the study area was shown to the committee. Information on these ongoing studies will be provided to the committee at its September meeting.

Andrew Schmid, King County, questioned whether there is any information available on the strategies used to keep people from traveling on I-5 during the summer construction which closed lanes of traffic. John Okamoto, Washington State Department of Transportation, reported that there are traffic volume numbers available, but why those numbers decreased during construction is not known. Jeff noted that both Vancouver and Portland have had similar experiences and there might be information on how traffic volumes were decreased. Virginia Gunby requested information on whether increased transit ridership in Seattle is a result of demand management approaches.

EVALUATION METHOD AND CRITERIA

Rob Fellows, Washington State Department of Transportation, briefed the committee on a potential approach for evaluating alternative solutions. This was intended to begin the discussion of how to evaluate the various concepts and solutions, which will lead the group to a set of recommendations. Rob outlined steps in the process, types of criteria and measures that may be used, and how criteria would be applied at each step. The September meeting agenda will include discussion of potential criteria.

In the overall process road map discussed with the Study Committee at its July 1 meeting, three phases of the project were outlined. They included (1) defining the problem and evaluation method, (2) developing and evaluating concepts, and (3) combining concepts into solutions and agreeing on a set of recommended solutions. Within these three project phases, criteria will be used in three different ways, including initial screening, concept evaluation, and solution evaluation. The Study Committee has spent time defining individual members' interests and those will be part of the criteria development process. For example, an interest in cut-through traffic could lead to a criterion that regional traffic on local streets be reduced. This criterion would be measured by how much traffic is reduced and where. Types of criteria may include effectiveness, impacts, and cost and cost-effectiveness.

During the evaluation of potential concepts, staff suggests that similar concepts be grouped together according to purpose. For example, noise walls and transit lanes should not be compared against each other, as they attempt to accomplish different things. During the initial screening phase, a small set of criteria would be chosen for each group of concepts and a minimum effectiveness threshold would be established. Supplemented with professional judgment, questions such as "does it address the problem?" and "can it be done?" may be used to evaluate concepts and determine what ideas are fatally flawed. During concept evaluation, the focus would be on whether each concept is effective at what it is trying to accomplish. For example, does a HOV lane effectively reduce traffic congestion? Finally, Rob suggested that combining concepts into potential solutions be based on "strategies to help organize the different concepts for full evaluation."

Roy Francis, King County, asked whether concept evaluation would be tested for robustness? Rob responded that criteria can be tested for whether a specific criterion makes a difference in how a concept would be ranked. Over the next several months, the Study Committee will be asked to develop and agree on a menu of criteria, develop a measure for each criterion, and identify which criteria to apply at each stage. Weighting and sensitivity analyses are options available to the committee. Maggi Fimia, King County, requested that total costs, and benefits of a solution be included in the information presented on a specific concept, for both short and long timeframes. Also, the information provided on a specific concept should not be subjective. Paul Cowles suggested that cost information be used as a criterion after the initial screening has been completed. Doug Pullen, Highway Users Association, noted that weighting should not restrict the group's flexibility, so that a concept that rates a 9 is not automatically eliminated because another concept rates 9.5.

Virginia Gunby questioned whether the evaluation method leaves room for both qualitative and quantitative criteria. Rob responded that both types of criteria are important and should be considered. Margaret Doman expressed concern that the committee is spending a lot of time on ground rules and other process issues and has not delved into the substance of the issue, such as strategizing concepts, as was presented in the road map. Rob noted that strategizing concepts will begin at the September meeting and there is a planned workshop in February to discuss specific strategies. Donovan Tracy expressed support for an approach that is concept driven and devotes resources to testing concepts as opposed to extensive data collection and analysis for identifying concepts. Virginia questioned whether any concept can be proposed or whether non-DOT alternatives are off the table. Rob responded that any idea about how to improve traffic across Lake Washington can be suggested and considered by the committee.

Any questions or comments on the proposed evaluation method should be directed to Rob Fellows. Pat asked the Study Committee if it agreed that its process could move forward using this evaluation method as a general approach, maintaining the possibility for revisiting and revising it. ***The Study Committee agreed that this evaluation method could be used as a general approach, pending development of specific criteria.***

ADOPTION OF GROUND RULES

Pat Serie introduced revised ground rules proposed for adoption. One issue of concern to a lot of members was what will define consensus. Pat reminded the group that the Study Committee's mission is to develop a set of recommendations, not reach a decision on one solution. Consensus is defined as the group reaching substantial agreement that it can move forward. When consensus is not possible on a decision or recommendation, a process of voting or ranking the alternatives will define the level of support. Thus, the group may end up with consensus for some solutions and a designated level of support for additional solutions. Those differing levels of support will be documented as the recommendation moves forward.

With that understanding, Study Committee members also suggested several other minor changes to the revised ground rules. ***Based on those changes, the Study Committee reached consensus and accepted the ground rules***. A final version of the ground rules is attached.

PUBLIC PARTICIPATION PLAN

Lorie Parker, CH2M Hill, noted that a few responses were received by Study Committee members on the proposed public participation plan presented for comments at its July 1 meeting. She introduced Margaret Norton-Arnold, Norton-Arnold & Janeway, to discuss the implementation of the plan. Margaret reported that the technical and public involvement consulting team will be developing a questionnaire for Study Committee members to assess needs for assisting members in their own public outreach. The team is also working on a monthly update to be mailed following each committee meeting as well as a summary of public input received to date. Summaries of public input received to date were distributed to the Study Committee and Margaret asked for feedback on whether the format and level of detail were appropriate.

Public workshops were proposed in the public participation plan and the planning for those is now under way. It is anticipated that three workshops will be held in late September on the east, west, and north sides of the lake. These workshops will introduce the process and share the draft problem statement with the public. Eugene Wasserman expressed concern with having workshops early in the process to focus on the problem statement, which is not the substantive issue. Also, workshops are attended by a limited portion of the public and do not capture broader public opinion. Margaret responded that the public does need to understand and know about the process in the beginning stages rather than be surprised when the Study Committee recommends a set of solutions.

Donovan Tracy questioned whether public opinion polling or focus groups are being considered to complement the public outreach. Margaret responded that polling and focus groups have been suggested for later in the process. Lorie added that it has been a challenge to balance the need for public input with the desire to not spend large sums of money on getting that public input so early in the process. Paul Cowles stated that outreach to the public should not present a set of solutions for them to react to. Maggi Fimia expressed support for a public outreach process that mirrors the Study Committee process and not spending money on polling unless the big picture is being considered. Mark Weed, Seattle Business, expressed support for polling earlier in the process and in conjunction with the public workshops. Donovan noted that any public outreach should be designed strategically and include only activities that fit with the decisions being made by the Study Committee. Virginia Gunby requested that the media clippings provided cover a broader range of topics, including transportation issues throughout the study area.

Paul Cowles suggested that the problem statement not be finalized prior to the public workshops, but should be a draft for the public to review. Maggi agreed and noted that public workshops could serve as a reality check for the Study Committee on what the problems actually are. Noel Schoneman, City of Seattle, suggested that the Seattle neighborhoods are becoming frustrated with planning and it would be more useful to have a draft problem statement for the public to react to. Also, the public workshops could

begin to discuss with the public what their experiences are with Trans-Lake traffic and what could serve as criteria for evaluating alternative solutions. Raleigh Watts, Seattle Neighborhoods, suggested that the public meetings be called open houses, as opposed to workshops. Jean Amick, Seattle Neighborhoods, requested that the public workshops be scheduled as soon as possible in order to place notices into community newsletters.

The Study Committee agreed to move forward with public open houses in late September or early October. More information (dates, locations, notification) will be provided prior to the September committee meeting.

PLANS FOR NEXT MEETING

The Study Committee will continue to meet in the afternoon on the first Wednesday of every month. This includes the following dates:

• September 2	Lake Washington School District Resource Center, 16250 NE 74th Street, Redmond
• October 7	Location to be determined.
• November 4	Museum of History and Industry, 2700 24th Avenue East, Seattle
• December 2	Museum of History and Industry, 2700 24th Avenue East, Seattle

The Study Committee agreed that the following topics will be included on the September 2 agenda:

- Review and acceptance of draft problem statement
- Background information on travel markets and ongoing studies
- Review of technical work program
- Action on leadership options
- Discussion of potential criteria
- Beginning to brainstorm potential concepts

It was also agreed that an effort will be made to identify carpooling opportunities between Study Committee members.

PUBLIC COMMENT

No public comment was received.

MEETING HANDOUTS

- Agenda
- Draft Framing the Problem, July 28, 1998
- Trans-Lake Travel Today
- Evaluation Method Overview
- Draft Ground Rules Proposed for Adoption
- Public Comment Topical Summary May 18 through July 24, 1998
- Public Comment Summary May 18 through July 24, 1998

- Draft Framing the Problem Suggested Revisions, August 5, 1998 from Virginia Gunby, Anne Knight, and Alan Borning
- Suggested Interests and Criteria from Nona Ganz
- Suggested Interests and Criteria from Alt-Trans
- Suggested Evaluation Criteria from Virginia Gunby, Anne Knight, and Alan Borning
- Framing the Problem in Terms of SR 520 – A Critique from Maynard Arsove
- Study Committee Member and Alternates Roster

MEETING ATTENDEES

Members

Jean Amick	Seattle Neighborhoods
Maynard Arsove	No Expansion of 520
William Backlund	Washington Legislature
Dan Becker	Points Communities
Paul Cowles	North Lake Business
Mike Creighton	City of Bellevue
Margaret Doman	Eastside Neighborhoods
Bob Edwards	Puget Sound Regional Council
Maggi Fimia	King County
Nona Ganz	City of Kirkland
Daryl Grigsby	City of Seattle
Virginia Gunby	1000 Friends of Washington
Tom Heller	Seattle Neighborhoods
Jim Horn	Washington Legislature
Ken Jacobsen	Washington Legislature
Doug Jacobson	City of Lake Forest Park
Anne Knight	ALT-TRANS
Jean Leed	Seattle Neighborhoods
Richard McIver	City of Seattle
Rob McKenna	King County
Ed Murray	Washington Legislature
Phil Noble	Eastside Neighborhoods
John Okamoto	Washington Department of Transportation
Peter Orser	City of Mercer Island
Doug Pullen	Highway Users Association
Rick Pusateri	Eastside Business
Phil Rourke	Points Communities Neighborhoods
Scott Rutherford	University of Washington
Donovan Tracy	Eastside Business
Ward Truess	Eastside Transportation Committee
Eugene Wasserman	Seattle Business
Raleigh Watts	Seattle Neighborhoods
Mark Weed	Seattle Business

Alternates

• Susan Baker	Seattle Neighborhoods
• Alan Borning	ALT-TRANS
• Maurice Cooper	Seattle Neighborhoods
• Tye Ferrell	City of Seattle
• Roy Francis	King County
• Kingsley Joneson	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Connie Niva	Washington Transportation Commission
• Dave Russell	Puget Sound Regional Council
• Noel Schoneman	City of Seattle
• Doug Schulze	Points Communities
• Larry Springer	City of Kirkland
• Andrew Schmid	King County
• Ed Switaj	City of Seattle
• Mitch Wasserman	Point Communities Neighborhoods

Seats Not Represented

• Nancy Adams	T.R.U.S.T.
• Doug Baker	Washington Trucking Association
• David Cortelyou	Seattle Business
• Mary Gates	Sound Transit
• Peggy Gerdes	North Lake Neighborhoods
• Bob Gillespie	Eastside Business
• Jim Hill	Eastside Business
• Janet Ray	AAA
• Debbie Treen	City of Bothell

Public, Media

• Elizabeth Davis	League of Women Voters - Lake Washington East
• Will Einstein	King County
• Vicki Fabré	Legislative Transportation Committee
• Andrea Geisler	Bridle Trails Community Club
• Barbara Gilliland	Sound Transit
• Linda Herzog	City of Redmond
• Todd Johnson	City of Kirkland
• Nora Johnson	City of Bellevue
• Jim Kluckow	Eastside Journal
• Terry Marpert	City of Redmond
• Nancy McCormick	City of Redmond/Eastside Transportation Partnership
• Melanie Moores	Washington Department of Transportation, NW Region
• Sabina Silver	Bellevue Chamber of Commerce
• Betty Spieth	Kirkland Chamber of Commerce
• Sandy Quinn	
• Doug Varvrick	Greater Seattle Chamber of Commerce

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
LAKE WASHINGTON SCHOOL DISTRICT RESOURCE CENTER, REDMOND
SEPTEMBER 2, 1998 1:00 P.M. TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

The Trans-Lake Washington Study Committee held its fourth meeting at the Lake Washington School District Resource Center in Redmond. Pat Serie, EnviroIssues, reviewed the agenda topics which included taking action on leadership options, reaching agreement on a draft problem statement, receiving information on travel origins and destinations within the Puget Sound region, learning about the technical and public involvement workscope, and brainstorming potential concepts.

Lorie Parker, CH2M Hill, provided a brief update on ongoing public involvement activities. The current newsletter is at the mailing house and will be mailed shortly. The newsletter covering this meeting will be prepared and distributed as soon as possible. Implementation of the project hotline has been delayed slightly because of the U.S. West strike, but it should be functioning shortly. The web site is also close to completion and should be a useful tool for both Study Committee members and the public tracking the project. All Study Committee members and alternates should be completing the pink questionnaire included in the meeting packet and returning it to Norton-Arnold & Janeway. The questionnaire asks how the technical and public involvement consulting team can assist members in making presentations and distributing information about the study.

Three public workshops have been scheduled. Each will include an informal session from 4:30 to 6:30 p.m., followed by a formal presentation and discussion from 6:30 to 8:30 p.m. The workshops will be held on September 22 at Kenmore Junior High School, September 29 at the Doubletree Inn in Bellevue, and October 2 at the Museum of History and Industry. Jean Leed, Seattle Neighborhoods, asked whether Study Committee members could participate during the formal portion of the workshops. Lorie replied that members and alternates should let her or Margaret Norton-Arnold known who will be attending the workshops. It is up to the individual members as to their level of participation.

A Study Committee workshop has been scheduled for September 30 from 9:00 a.m. to 5:00 p.m. at the Museum of History and Industry. A handout was included in the meeting packet outlining the topics to be covered. The workshop is intended to be an opportunity for members to hear information and discuss topics that relate to the study. Some Study Committee members requested that the workshop be held on a Saturday or in the evening to accommodate members who have obligations during the business day. Pat Serie suggested that, since planning was well underway, the first workshop be held during the day and the second workshop could be held at an alternative time for members who could not attend. It was also requested and agreed that the September 30 workshop would be videotaped. Any suggestions for speakers or information materials should be given as soon as possible to Rob Fellows or Bernard van de Kamp at WSDOT. An agenda will be circulated with the mid-month mailing.

The October 7 Study Committee meeting will be held at the Rainier Room in the Seattle Center.

PUBLIC COMMENT

Leonard Newstrum, a resident of Yarrow Point, distributed a comment letter to the Study Committee. He stressed that criteria used to evaluate potentials need to consider human factors, such as willingness to use HOV and transit. He also suggested that an additional criterion of feasibility be added to the proposed criteria of effectiveness, impacts, and cost.

DECISION ON LEADERSHIP OPTIONS

Pat Serie reminded the Study Committee that, at its last meeting, several members suggested that the group have some sort of leadership structure. In the meeting packet, four options were outlined for members to review and come prepared to discuss. Based on feedback since the packet mailing, there is strong support for the status quo, with some changes and improvements in the way the staff interacts with the Study Committee, as well as some support for a steering committee.

Paul Cowles, North Lake Business, expressed his support for the steering committee concept. Dan Becker, Points Communites, also supported the steering committee in that it will allow committee members to help both the facilitators and technical consultants in information gathering and other Study Committee functions. Virginia Gunby, 1000 Friends of Washington, suggested that a steering committee might be used by the staff to develop an overall strategy for the process and would be most useful at the end of the process when agreement is being reached on alternative solutions. Senator Jim Horn, Washington Legislature, suggested that a steering committee would create two levels of bureaucracy and might exclude some members from the decision-making process. He supports the status quo.

Daryl Grigsby, City of Seattle, expressed his support for the status quo; a steering committee would create a second level of review and bureaucracy. Connie Marshall, City of Bellevue, supported both Daryl and Senator Horn's comments. The Study Committee has yet to establish trust between its members and it is unlikely that members are willing to give up their seats and voices to sit on a steering committee and offer a regional perspective. Rob McKenna, King County, noted that a steering committee would be helpful and could offer advice on how the process is going. It could be selected based on the represented interests. Mark Weed, Seattle Business, also expressed concern with a second level of responsible parties. Groups of members that meet outside the regular Study Committee meetings are an effective way to bring forth ideas. He would support the status quo with the opportunity to revisit the steering committee concept at a later date.

Dan Becker noted that the leadership suggestion would assist the facilitation and technical teams in preparing materials for the Study Committee. The concept of a steering committee would be to have a rotating membership and an emphasis on focus and organizational assistance. Chris Leman, Seattle Neighborhoods, expressed concern with how the mailings and meeting locations have been prepared and handled and suggested that a sounding board made up of members be used before decisions are finalized.

Paul Cowles suggested that a steering committee will be necessary at some point. If the facilitation and technical teams continue to drive the process, committee members will not be forced to take ownership of the process or outcomes and thus make implementation more difficult. Eugene Wasserman, Seattle Business, noted that having one representative from an interest group on a steering committee would not be feasible. Each interest is not monolithic in its views and interests. Nancy Adams, T.R.U.S.T., noted that the Study Committee needs some type of structure and it should not continue to procrastinate on this decision.

The Study Committee agreed that it was not in agreement on the formation of a steering committee or any of the other leadership options. Therefore, the Study Committee would continue to operate under the status quo with the steering committee open for revisiting as the need arises. Paul Cowles was designated to continue to develop the concept of a steering committee with the involvement of interested members.

PROBLEM STATEMENT

In the packet for this meeting, the Study Committee had received a revised draft problem statement based on comments heard at the August 5 meeting. Since the packet was received, the facilitation and technical teams received additional comments. Those comments were incorporated into a second revised draft

which was distributed to the Study Committee at this meeting. The proposed action was to agree on a draft problem statement which will then be shared with the public attending the workshops at the end of September and beginning of October. The Study Committee would then review public input, revise the problem statement accordingly, and accept a final version.

Study Committee members suggested various changes to the revised draft problem statement. The wording agreed to by the Study Committee will be incorporated into the draft problem statement. The revisions will be incorporated into a revised draft problem statement (Attachment 1) which will be shared with attendees at the public workshops.

ORIGINS AND DESTINATIONS, TRAVEL MARKETS

Cathy Strombom, Parsons Brinckerhoff, presented information to the Study Committee on where people are traveling to and from in the Puget Sound region. The information presented is based on the Puget Sound Regional Council's (PSRC) 1995 model. The types of information available from the PSRC model include trip types or purpose, trip distribution, mode of travel, and traffic assignment (which route people are taking). The model is based on a variety of data sources, including local comprehensive land use plans; population, employment, and demographic information from census data and surveys of employers; census journey-to-work data; multi-year travel diaries; on-board transit and ferry origin-destination surveys; traffic counts, vehicle occupancy counts, and transit ridership data; and travel speed and travel time studies.

Each step in the model is validated and the mode must replicate existing travel across major screenlines (person trips, vehicle trips, vehicle occupancy) within 10 to 12 percent. The model is being continuously updated and recent updates include adding the ability to predict non-motorized trips. The Trans-Lake Washington Study will include additional validation of the model at the subarea level.

Sample data from the model answer different questions, including what are the origins/destinations of trips to/from major activity centers, what are the mode shares, and who uses which routes to cross or go around the Lake. The information presented represents average weekday conditions, recognizing there will be seasonal variations. Maynard Arsove, No Expansion of 520, requested that the Study Committee receive the actual data (traffic counts) that comprised the average weekday condition. Nancy Adams, T.R.U.S.T., noted that the model is based on a random sampling of the population and is not a true origin and destination survey. Anne Knight, ALT-TRANS, asked whether trips from south Seattle were included in the model. Cathy responded that, yes they are but for display purposes, the data have been aggregated into districts with larger districts as we move away from the study area.

Maggi Fimia, King County, asked whether a projection for the 1998 to 2000 time period could be done based on the model. Cathy responded that 1995 volumes could be factored up to 1998 or 2000 based upon growth factors out of the model. (PSRC's model predicts 2010 and 2020.) Maggi also asked whether the model could provide information for travel on ferries. Cathy responded that the model does include ferries and that there is a separate more detailed model which Washington State Ferries developed which might be useful.

Cathy walked through several examples of the results generated by the model. Several conclusions could be reached, including the fact that there are many markets to serve and origin and destination results are very complicated – it is not just traffic between downtown Seattle and Bellevue. This could lead us to the conclusion that a multifaceted solution may be needed to address the many travel markets.

Both Paul Cowles and Virginia Gunby noted that presenting models to the public is very difficult because of the models' uncertainties. Several Study Committee members requested that the technical team add to the presentation further explanations of the information being presented. Chris Leman noted that the

definition of congestion in the transportation glossary and as used in various places is incorrect and should be clarified. Congestion is defined as not being able to travel at optimal legal speeds. He feels that traveling at optimal legal speeds is not always the best way of getting the maximum traffic volume through a specified area.

King Cushman, PSRC, noted that the data included in the model are fairly accurate. Over 1,600 people are included in the panel survey on a yearly basis. Jeff Peacock, Parametrix, noted that on the SR 16 project, a model similar to the PSRC model was used and then an origin and destination study completed. The origin and destination study results were within 10 percent of the model's predictions.

INTRODUCTION OF DRAFT TECHNICAL AND PUBLIC INVOLVEMENT WORK PROGRAM

Rob Fellows, WSDOT, provided information on the proposed technical and public involvement work program. The information presented follows the road map previously presented to the Study Committee and outlines likely agenda topics, work products needed to support the agenda, and other work products that will be prepared throughout the process. At the October meeting, the Study Committee will be presented with specific work tasks, relative costs, and cost tradeoffs (i.e., cost of different tasks under public involvement). After receiving input from the Study Committee in October, WSDOT will be able to negotiate a scope of work with the technical consultants for the remainder of the process.

Maggi Fimia asked that information on the pricing of transportation be provided to the Study Committee. There is a PSRC draft bipartisan study almost complete that should be shared and presented to the group. Virginia Gunby stressed the need for flexibility and contingency in the workscope. Bob Gillespie, Eastside Business, questioned whether there will be a limit on the amount of information reviewed by the technical team. There needs to be a decision about what type of information is simply interesting, but not directly related to the Trans-Lake Washington Study. Donovan Tracy, Eastside Business, questioned the rationale behind evaluating transit, roadway, and other concepts in a phased process. The Study Committee should not be screening out transit concepts before it has had a chance to also screen the roadway concepts. Rob Fellows explained that there is no screening being done in Phase 2, rather an evaluation and study of the different concepts. The phased approach is simply because there is not enough time at every meeting to review concepts in all four categories.

Chris Leman expressed concern that the process is front-loaded with construction-related subjects and neighborhood impacts and transportation demand management are covered later. He wants TDM/TSM to be addressed early so implementation can begin. Concepts relating to TDM/TSM and neighborhood impacts should be considered earlier in the process. Rob Fellows explained that they would be evaluated basically in parallel to result in a comprehensive and integrated set of alternative solutions.

MENU OF CRITERIA FOR EVALUATING ALTERNATIVES

Jeff Peacock provided an overview to the Study Committee on the proposed process for evaluating concepts and solutions and the proposed approach to preliminarily screening concepts. During the first and second meetings of the Study Committee, members spent time identifying their interests. Those interests have been translated by the technical team into proposed categories of criteria and were provided to the Study Committee in their meeting packet. The suggested categories are: effectiveness, impacts, and cost.

In the current phase of the study, the approach is to conduct an initial screening of the concepts or "ideas" that may be combined to form potential solutions. The goal of that screening is to identify a set of reasonable concepts, not determine which are the best. The "effectiveness" criterion would be used to ask

how well a potential solution would address the problem. "Impacts" would determine what other effects a concept might have. Finally, "cost" would ask how do costs and benefits compare. The technical team is proposing to use these broad categories of criteria for preliminary concept screening, potentially based on something like a 1 to 5 rating approach. The technical team could complete an initial screening, which would then be validated and/or changed by the Study Committee.

Maggi Fimia stated that effectiveness should include both short-term and long-term effectiveness. Also, the technical team should use the most current available data. Jeff noted that the Study Committee was provided at the August 5 meeting with a list of existing studies and information that the technical team will be using. If members have other information they would like to suggest be used, they should give that information to the technical team. Raleigh Watts, Seattle Neighborhoods, questioned whether transit and roadway were going to be compared against each other for tradeoffs. Jeff responded that they would not be compared against each other in the initial screening. However, at some point, different types of solutions will be evaluated against each other.

Chris Leman questioned whether a concept that is cost effective and fully developed earlier in the process can be moved forward into implementation prior to the completion of the entire study. Dan Becker agreed that there will need to be a rating system by which concepts are evaluated. Effectiveness and impact are appropriate at the preliminary screening level, however, cost evaluation would require a detailed level of information probably not available now. Dan prefers that the consultant team not prepare an initial screening recommendation, but let the Study Committee perform the screening. Jeff suggested that only a gross level of estimation will be used during the preliminary screening stage to compare concepts against each other. Virginia Gunby expressed concern that the criteria are biased towards a type of solution and do not allow for the packaging of concepts together to make a solution. Chris Leman stressed that concepts should not only focus on the region, but also on specific areas.

Chris Leman also asked for agreement by the Study Committee to move forward with implementation of neighborhood impacts and TDM concepts earlier in the process. Connie Marshall responded that TDM and neighborhood impacts need to be compared along with other concepts and evaluated equally. After further discussion, the Study Committee did not reach agreement on Chris's request.

BRAINSTORM POTENTIAL TRANS-LAKE CONCEPTS

Renee Montgelas, WSDOT, provided a brief introduction prior to the Study Committee's brainstorming of potential concepts. In the meeting package, the Study Committee received a list of potential concepts that have been suggested to date. A commitment was made at the beginning of the study that all suggested concepts would be "on the table" and it would be up to the Study Committee to determine what concepts move forward into further evaluation. These potential concepts come from a variety of places, including e-mails, letters, and phone calls from the public and past and current studies. The list of concepts is meant to be only a starting point for the Study Committee's brainstorming.

The Study Committee spent time in small groups brainstorming potential concepts within five categories: transit, roadway, land use, TDM/TSM, and enhancement. The results of the brainstorming activity are included in Attachment 2. Any additional concepts should be forwarded to EnviroIssues by Friday, September 11 for inclusion in concept descriptions to be prepared before the next meeting.

PLANS FOR NEXT MEETING

The Study Committee agreed that the following topics would be on the October 7 meeting agenda:

- Summary of input received at public workshops
- Revisit of problem statement based on public input

- Discussion of concept descriptions
- Input and discussion on technical work program
- Agreement on criteria categories

The following meetings for the Study Committee have been scheduled:

• Wednesday, October 7 1:00 p.m. to 5:00 p.m.	Seattle Center, Rainier Room, Seattle
• Wednesday, November 4 12:30 p.m. to 4:30 p.m.	Museum of History and Industry, 2700 24th Avenue East, Seattle
• Wednesday, December 2 12:30 p.m. to 4:30 p.m.	Museum of History and Industry, 2700 24th Avenue East, Seattle

PUBLIC COMMENT

Tom ?, Medina City Councilmember, commented on the proposed criteria. There needs to be a criterion that takes into consideration sensitive areas, such as the Arboretum and Wetherill Nature Preserve.

SUMMARY OF ACTION ITEMS

- The September 30 workshop will be videotaped and provided to members and alternates as requested.
- Paul Cowles will collect ideas on steering committee structure.
- The presentation on travel markets will be augmented to include description and definition of information being presented.
- Transit projections will include RTA projects.
- PSRC pricing studies will be distributed to the Study Committee and the technical consulting team will determine the appropriate time to present the information to the group.
- Future descriptions of potential concepts will include elaboration on source of suggestions received via e-mail.
- Additional input on the technical work program should be sent to Rob Fellows.
- Additional concepts should be sent to EnviroIssues by Friday, September 11.

MEETING HANDOUTS

- August 31 Revised Draft Problem Statement - Annotation and Revised Statement
- Types of Information Available from PSRC Model
- Travel Markets Presentation

- Evaluating Concepts and Solutions Presentation
- Proposed Approach to Preliminary Screening of Concepts
- Proposed Study Committee Agendas and Technical Work Products
- Additional Potential Concepts Suggested – August 19-31, 1998
- Livable Places Update – July 1998
- Problem Statement Addition Suggested by Tye Ferrell
- Letter to Study Committee from Leonard Newstrum – September 2, 1998
- Correspondence from Jean Amick et al. to Pat Serie
- Traffic Across and Around Lake Washington: A Public Workshop
- Upcoming Meetings Schedule – September 1, 1998

MEETING ATTENDEES

Members

Nancy Adams	T.R.U.S.T.
Maynard Arsove	No Expansion of 520
William Backlund	Washington Legislature
Dan Becker	Points Communities
David Cortelyou	Seattle Business
Paul Cowles	North Lake Business
Aubrey Davis	Washington Transportation Commission
Margaret Doman	Eastside Neighborhoods
Bob Edwards	Puget Sound Regional Council
Maggi Fimia	King County
Nona Ganz	City of Kirkland
Peggy Gerdes	North Lake Neighborhoods
Bob Gillespie	Eastside Business
Daryl Grigsby	City of Seattle
Virginia Gunby	1000 Friends of Washington
Tom Heller	Seattle Neighborhoods
Jim Hill	Eastside Business
Jim Horn	Washington Legislature
Rosemarie Ives	City of Redmond
Ken Jacobsen	Washington Legislature
Doug Jacobson	City of Lake Forest Park
Anne Knight	ALT-TRANS
Jean Leed	Seattle Neighborhoods
Richard McIver	City of Seattle
Rob McKenna	King County
Ed Murray	Washington Legislature
Phil Noble	Eastside Neighborhoods
John Okamoto	Washington Department of Transportation
Peter Orser	City of Mercer Island
Doug Pullen	Highway Users Association
Rick Pusateri	Eastside Business

• Janet Ray	AAA
• Phil Rourke	Points Communities Neighborhoods
• Scott Rutherford	University of Washington
• Donovan Tracy	Eastside Business
• Debbie Treen	City of Bothell
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business
• Raleigh Watts	Seattle Neighborhoods
• Mark Weed	Seattle Business

Alternates

• Susan Baker	Seattle Neighborhoods
• Alan Borning	ALT-TRANS
• Madeline Clemann	Eastside Neighborhoods
• Rich Conrad	City of Mercer Island
• Maurice Cooper	Seattle Neighborhoods
• Tye Ferrell	City of Seattle
• Roy Francis	King County
• Kingsley Joneson	Seattle Neighborhoods
• Chris Leman	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Jim MacIssac	Eastside Transportation Committee
• Chuck Mize	King County
• Connie Niva	Washington Transportation Commission
• Dave Russell	Puget Sound Regional Council
• Noel Schoneman	City of Seattle
• Larry Springer	City of Kirkland
• Andrew Schmid	King County
• Ed Switaj	City of Seattle
• Mitch Wasserman	Point Communities Neighborhoods
• Fred Watson	No Expansion of 520

Seats Not Represented

• Doug Baker	Washington Trucking Association
• Mary Gates	Sound Transit

Public, Media

• Bruce Brown	Pacific Rim Resources
• Gil Eade	Wetherill Nature Preserve
• David Hull	King County Department of Transportation
• Nora Johnson	City of Bellevue
• Chris Rose	Washington Transportation Commission
• Doug Vavrick	Greater Seattle Chamber of Commerce
• Rich White	Bellevue Chamber of Commerce

ATTACHMENT 1

Trans-Lake Washington Study

DRAFT PROBLEM STATEMENT
(draft – September 3, 1998)

The draft problem statement below was adopted as an "imperfect" draft by the Trans-Lake Washington Study Committee at its September 2 meeting. The purpose of the problem statement is to guide the committee as it develops concepts and solutions for solving Trans-Lake problems. The Study Committee has had three "review and revise" opportunities. A preliminary draft had been developed in July based on members' statements of interests and concerns. After comments received during and after the August 5 Study Committee meeting, a second draft was prepared, and after additional comments, revised again. Additional amendments were made at the September 2 meeting. The Trans-Lake situation is so complex that members are still debating how to express certain concerns, how much to emphasize some points over others, etc. Committee members are eager to receive citizen comments which will be considered for incorporation at the Trans-Lake Washington Study Committee on October 7th and at subsequent meetings.

The Purpose of the Trans-Lake Washington Study is to identify a set of "reasonable and feasible solutions" to improve mobility across and around Lake Washington. Our focus is on transportation as a means of access for residents to employment, housing and activities, and for businesses to move their products and provide their services efficiently and reliably while minimizing and mitigating impacts and, where possible, enhancing the quality of our neighborhoods and our environment. Transportation is inextricably linked with land use, patterns of growth, and environmental quality.

Problem Statement

Land Uses and Transportation Systems Are Not Integrated In Their Planning and Implementation
The evolution of our transportation system has not kept pace with rapid job and residential growth. Transit development, demand management implementation and roadway capacity additions have not been sufficient to keep pace with the trips generated by this growing population. Regional land use and transportation plans and policies are tending to concentrate and integrate residential and employment patterns more than in the past, partly in an effort to ease burdens on the transportation system. However, significant infrastructure investments and demand management policies also called for by those plans have only been partially implemented so that the infill achieved has placed greater burdens on the existing system. Given this context, the worsening congestion levels we are currently experiencing in the Trans-Lake Study area are projected to get very much worse over the next ten to twenty years.

The Transportation System Suffers from Extensive Congestion
During much of the day and especially at peak commute periods, transportation facilities across and around the north end of Lake Washington and routes feeding those Trans-Lake facilities are heavily congested. When congestion occurs on Trans-Lake routes, it backs up onto major north-south corridors

and adjacent arterials, congesting those routes as well. Those dependent on these routes for regional access, safe travel, and the movement of freight and goods, experience travel delays and a corresponding loss of economic productivity and quality of life.

Reliability and Safety of the System Are Impaired
The vehicular system around and adjacent to the lake is vulnerable to incident caused conditions. Minor incidents generate significant delays throughout the entire system; more significant incidents cause near gridlock conditions as vehicles avoid a blocked route only to crowd others. Conflict between regional and local traffic, lack of access to adequate alternative modes, weave patterns near interchanges and substandard HOV lanes and/or the lack of shoulders also contribute to this unreliability and to a reduction in safety. A longer term issue affecting system reliability and safety is the structural condition of the Evergreen Point Floating Bridge. Where HOV lanes are not present, transit and carpool users are delayed by traffic congestion in general purpose lanes, reducing the effectiveness of existing transit and ridesharing services. For those desiring pedestrian or bicycle travel the system is incomplete, making those options either impossible or unsafe.

Neighborhoods, Business Centers and the Environment are Impacted
Neighborhoods, local arterial streets and smaller residential streets in the vicinity of cross-lake routes are negatively impacted by high traffic volumes which result in "cut-through" traffic, noise, vibration, dust and restricted access for local residents and local businesses. Walking and bicycling are made less safe and less enjoyable. Considerable land is consumed and some neighborhoods are effectively divided. Vehicle emissions negatively impact air and water quality throughout the region and particularly in local problem areas. Congestion can worsen air pollution and cut-through traffic.

ATTACHMENT 2

TRANS-LAKE WASHINGTON STUDY COMMITTEE BRAINSTORMING POTENTIAL CONCEPTS RESULTS FROM SEPTEMBER 2, 1998

TRANSIT CONCEPTS

- Express lane corridor SR520/SR 522 tie in with RTA in University District
- Tie SR 520 improvements with a major solution to "Mercer Mess"
- LRT Redmond to Kirkland
- Better connections between Redmond and I-90
- LRT on SR 520 light rail (congestion, noise)
- Transit ferries
- HOV lanes and two general purpose lanes on bridge
- HOV lanes over Ship Canal
- Loop bus shuttles and routes
- Connect park and rides and activity centers
- Free bus to Seattle
- Rail from Seattle/Sand Point through Kirkland to Redmond/Overlake
- Rail from downtown Seattle via Lake Union to Redmond in SR 520 corridor with spurs to Kirkland, Bellevue CBD and Overlake
- Rail on I-405
- Add amenities to bus service
- Monorail across SR 520 through Bellevue back across I-90
- Bus only lane, I-5 conversion, Convention Place and I-5
- HOV expansion length of SR 520
- RTA style light rail from I-5 on SR 520 to Redmond
- Dedicated transit
- Complete HOV system – SR 520/SR 522/I-90/I-5
- Ferries across lake with transit at ends
- Rail to connect with existing RTA proposals (monorail, other) Overlake to Seattle
- Improve bus LFP/VYB – Eastside
- Personal rapid transit network – Bellevue – UW – Seattle
- Better regular network for transit
- Community oriented transit
- Circulator system for Eastside
- Light Rail in SR 520 corridor and Burlington Northern tracks from Sammamish Plateau to I-90
- Passenger ferry – Kirkland to Sand Point
- Ferry – Eastside to UW
- Shuttle buses from transit centers
- Maglev Monorail downtown Seattle to Redmond
- PRT = personal rapid transit
- Transit with dedicated right of way "moving and grooving"
- Regional subsidy – free transit use

- Escalator/people mover across lake
- Expand light rail across and around lake
- Point to point charter service (e.g.,) Bellevue to UW
- No cars in Seattle/urban centers
- More transit service and $$$
- Add light rail to SR 520 (e.g., Montlake to Bellevue, Kirkland, and Overlake)
- Extend light rail to SR 522 corridor (e.g., Bothell)
- Park and ride lot by Montlake or stadium
- Kirkland-Sand Point or Kirkland-UW passenger ferry
- Pedestrian/passenger or car ferry – Kirkland to Sand Point
- Implement I-90 MOA to have rail across I-90
- Future rail on SR 520 to connect with LINK University station and on to Ballard community
- Sound transit rail station at Roanoke interchange to transfer to bus service/LINK
- Promote transit friendly, compact redevelopment infill and provide new modes/visions for development of the Eastside
- High school/college driver education program that promotes transportation choices and incentive to walk, bike and use carpools/vanpools
- Encourage jobs/housing balance
- Construction with transit emphasis

ROADWAY CONCEPTS

- Bike lanes
- Better connection between Redmond and I-90
- Another way across Sand Point/Kirkland – limited access across lake
- SR 520 LWA Bld to Redmond/Fall City for local trips
- Local – new and better access
- I-5 and I-450 additional capacity
- Widen SR 520 by adding HOV lanes and direct access lanes
- Widen SR 520 by double decking
- Widen SR 520 with tunnel underneath
- Direct connect between UW and SR 520 (avoid Montlake cut) (access ramps – HOV)
- Tunnel from SR 520 to merge to I-5 or Mercer
- Better transitions for HOV between roads (i.e., I-405 and SR 520)
- Better connections between SR 520, I-405, and I-5
- Move entrance to I-5 North from Mercer to inside
- Expand I-405
- On bridge pockets for emergency vehicles and pullouts
- Parallel SR 520 bridge with increased capacity
- Parallel bridge Sand Point to Kirkland
- I-5 to UW direct connection to get off Montlake
- Allow flammable cargos through I-90 (make it cheaper)
- Eliminate Arboretum ramps
- Non-motorized
- Bike/pedestrian pathways across SR 520 – restriping or hang on pontoons

- Second SR 520 deck with cars, transit, bicycles, and pedestrian ways
- Meter SR 520 ramps with HOV bypass
- HOV only exit
- Rehab pontoons
- Remove SR 520 bridge
- Restore neighborhoods
- Dedicated HOV and transit lanes
- Tunnel under lake for cars and trains
- Add four lanes to SR 520 for HOV and transit
- Bridge from Kirkland to Sand Point
- Link I-405 and I-5 (arterial links) bridge from Sand Point
- Convert existing SR 520 to HOV/transit only (HOV = 3 passengers)
- Expand SR522 somehow – add rail and car capacity
- Six-lane SR 520 with 2 HOV, 2 general-purpose, 1 bike – tunnel it all
- Dedicated on-ramps for HOV, all HOV systems
- More general purpose lanes on SR 520
- Rebuild SR 520 corridor with general-purpose rail, bike, and pedestrians in virtual tunnel
- Fix Mercer Mess
- Build highway 605
- Widen and upgrade geometrics on SR 520 between lake and I-405
- Add HOV lanes to SR 520 entire length
- Double deck SR 520
- Freight/truck use of I-90 – center road (connect to Port)
- 6-lane highway I-405 to I-5 (North Seattle)
- Kirkland to Sand Point bridge
- I-5/SR 520 connection improvements (express lanes)
- Open HOV lanes to SOV off-peak
- Tunnel in addition to SR 520
- North/south corridor in east King County
- Peak hour HOV only access on existing ramps
- North end of the lake route (see map) east-west
- Instead of replacing SR 520 bridge, just replace pontoons
- If possible, ingress and egress should be on opposite sides of the highway

TDM & TSM CONCEPTS

- All TDM/TSM – all study area
- Transportation pricing
- Tolls to reduce congestion
- Fill empty seats in car
- Pay drivers to take extra passengers
- "Smart Road" technology
- Smart trak
- Identify TDM/TSM goals and consequences of failure
- Free bus passes for everyone
- Complete TDM program in corridor with pricing etc., include sports stadium

- Toll for non-HOV lanes
- Require employees to cash out parking benefits
- Free transit passes (property tax) to all households with $1 gas increase with regulated parking tax
- Spacing out demand – staggered hours, etc.
- Different transit pricing
- Regional pay for parking
- Expanded intelligence system
- Pay to use HOV lanes at non-peak times
- Pay people to use alternate modes (huge $)
- Ration use of SR 520 – other areas
- Transponder – pay more for certain times
- Mandatory 4 day work week
- Tolls on all bridges
- Free transit
- Subsidize vanpools
- TDM: SR 520 toll
- Toll on any additional SOV SR 520 lanes (with barrier separation)
- SOV pay to use HOV
- SR 520 – transit only
- HOV for commercial use during non-peak hours
- Bike land on SR 520
- HOV connections from I-5 to SR 520 at interchange
- Regional parking policies
- Positive incentives to encourage transit and carpool use, such as parking cash-out policies
- Schools – new pass policies
- Strong support for transportation choices and transportation demand management with no new bridge
- Stronger metering of on-ramps on the east side to keep the bridge itself free moving
- Transit and carpool bypasses for all meters
- Congestion pricing for SR 520 using automated toll collection so that cars don't have to stop – price contingent on time of day (free during off-peak hours, more at rush hour)
- Turn one of the bridge lanes into an HOV lane, with seamless HOV connections all the way along SR 522 on the Eastside and to I-5. No new construction for this, just one lane conversion.

LAND USE CONCEPTS

- Housing location to minimize transportation needs
- Affordable housing
- Transit oriented development in Kirkland
- Enforce concurrency
- Tie revenue from growth to infrastructure
- Achieve density goals within UGB
- Create a regional fiscal mechanism that can affect land use practices/patterns
- Huge TOD tax benefits/corridor
- Urban village tax incentives for people who live close to work

- Housing policies to get housing close to employment
- Increase density in adjacent lands
- Housing and commercial on Park and Ride lots
- Require sidewalks on arterials, identify missing links
- Require better local connectivity
- Growth moratorium on areas that are not providing sufficient transportation systems
- Protect parks, Arboretum, and nature preserve on both west and east sides of SR 520

ENHANCEMENT CONCEPTS

- Mitigation, noise, visual, lid
- Bike lanes
- Bike and pedestrian path on SR 520
- Fishing pier with pedestrian pathway
- Attempt ways to get around locally, bikepaths, trails
- Lids, amenities on SR 520
- Public boat access for bridge ends with bike, transit improvements
- Remove flyover ramp SR 520/I-5 replace with tunnel including transit only lanes
- SR 520 – bike lanes and pedestrian sidewalks
- Pedestrian and bike access on SR 520 (Montlake – Eastside)
- Soundwalls – restrict use of sirens and compression brakes
- Lids with ball fields
- Local option-gas tax
- Sidewalks on SR 522 where missing
- Explore noise mitigation, design options, with trees and landscaping
- Fill gaps in bicycle networks, especially I-90 to other points (separated roadway/bike facilities)
- Extend SR 520 sound absorption road surface from Evergreen Point back to I-90
- Install sound absorbing panels above express lanes on I-5

OTHERS

- An intergovernmental strategy to promote livable communities, reduce congestion and a new vision to protect rural areas open spaces, forest and promote urban centers. A package of long, medium and short-term proposals.
- Change the focus of radio/TV etc. traffic reports from "congested roads" to "non congested roads"
- Start with appropriate government offices designating the optimal alternate routes to/from major traffic centers (employment, sports, etc.)
- Campaign for traffic reporters to emphasize the commute routes that are least congested
- Extend SR520 sound-absorbing road surface from Evergreen Point Bridge westward to I-5.
- Install sound-absorbing panels above the express lanes on the I-5 Ship Canal Bridge
- Increase trees and shrubs along the SR 520/I-5 interchange
- Strong support for transportation choice and transportation demand management, with no new bridge.
- Construction with transit emphasis

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
SEATTLE CENTER, SEATTLE
OCTOBER 7, 1998 1:00 P.M. TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Doug Hurley, CH2M Hill, introduced himself as the facilitator for the meeting, replacing Pat Serie who had a family emergency and was unable to attend. Doug noted that the study team has been receiving a large amount of public input via e-mail, letters, and calls to the hotline, some of which has been quite lengthy. He asked for direction from the Study Committee as to whether the team should be providing the original input along with a summary. After a brief discussion, the Study Committee agreed that it would like to receive the original communications that have been sent to the study team. Bob Gillespie suggested that the Study Committee be provided with a reference list of relevant materials, rather than the entire document. That way members can choose which materials they want to receive.

Maynard Arsove, No Expansion of 520, referenced the Evergreen Point Bridge Approach provided to the Study Committee in its mailing packet, and questioned which parts of the bridge would actually have to be replaced. Jeff Peacock, Parametrix, responded that the report only assessed the floating portions of the bridge and did not consider replacement needs for the fixed portions of the bridge. The floating portion of the bridge will need replacement within 25 years; current 20-year plans include only seismic retrofit and preservation work for the fixed structures.

PUBLIC COMMENT

Barbara Alley provided public comment to the Study Committee regarding a potential solution for Trans-Lake congestion. Bus-only ferries could land on existing streets, avoiding taking up large amounts of expensive lakefront property and traffic congestion. It would also provide a way for commuters to get across the lake without standing in the rain while waiting for a bus

WHAT DID WE LEARN? REPORT BACK ON SEPTEMBER 30 WORKSHOP

Rob Fellows, Washington State Department of Transportation (WSDOT), reported back to the Study Committee o the workshop held on September 30. The purpose of the workshop was to begin building a common understanding of the types of concepts that might be used by the Study Committee in building its set of solutions. Six panels presented the group with information on the Metropolitan Transportation Plan (MTP), transit concepts, roadways, enhancements, mitigation, demand management, land use, and the Land Use Transportation Air Quality Study (LUTRAQ). A summary of the workshop is being prepared and will be mailed to the Study Committee along with meeting handouts and additional information materials. A videotape of the workshop will be provided to those Study Committee members who were unable to attend.

Study Committee members requested that they receive information on the monorail initiative as well as the use of an underground tunnel for light rail by Sound Transit.

WHAT THE PUBLIC TOLD US: REPORT BACK ON PUBLIC WORKSHOPS

Margaret Norton-Arnold, Norton-Arnold & Janeway, presented a summary of the three public workshops to the Study Committee. Eight members of the public attended the meeting in Kenmore, 24 attended the

Bellevue meeting, and 38 were present at the meeting in Seattle. Study Committee members also attended; one of the most valuable parts of the workshops was the interactions between the public and committee members.

The three questions posed to the public included what was their reaction to the draft problem statement; what other potential concepts should the Study Committee consider; and what issues should the Study Committee consider when evaluating concepts. The public does care about this issue and has a lot of ideas. The discussions were thoughtful and complex and demonstrated that the public has a high expectation for what the committee will ultimately produce. Reactions to the problem statement included the need to implement some type of demand management; realistic pricing of the transportation system needs to occur; and acknowledgment that single occupancy vehicles dominate the roadway and should be taken into consideration.

Some of the concepts suggested by members of the public include copying the European model of transportation systems; increasing the cost of using the transportation system; providing incentive and disincentive user fees; using a "no-concrete" alternative as a baseline for comparing other solutions; and considering new roads. Members of the public also made suggestions regarding the evaluation of potential concepts that included considering cost effectiveness, equity, environmental impacts, benefits for the greatest number of people, decreasing the number of trips, and immediate impact.

Margaret noted that while the public workshops provided the Study Committee with a lot of good ideas, the small number of attendees pointed out the need to reach those members of the public who did not attend. This is being done through the hotline, newsletter, and a letter being sent to organizations around the Puget Sound region introducing the study and offering to come talk to their members directly. Jim Horn, Washington Legislature, noted that public meetings are not always the most effective way to reach the general public because attendees often come with pre-determined opinions. Focus groups and other means of reaching the public should be used. Another Study Committee member noted that a strong education effort is needed to educate the public before the public will be ready to provide thoughtful input on the matter.

Nancy Adams, T.R.U.S.T., expressed her organizations' concerns that the newsletter is entitled "Crossing." This gives the impression that a new bridge is the predetermined solution of he study. Also, the public workshops were a disappointment because of the low turnout and lack of media attention. There is a concern that the project is spending money on ineffective efforts. Donovan Tracy, Eastside Business, noted that surveys and focus groups are one way to reach the public and that potential concepts should be tested to see how acceptable they would be to the public, i.e., how sensitive transit use it to pricing.

Mark Weed noted that those who attended the public workshops found them very informative and that they are one way to reach out to the community. Those who attended the public workshops did represent different perceptions of the Puget Sound region. Maynard Arsove expressed his opinion that relieving congestion is not possible just by building new roadway capacity and other alternatives should be considered. Virginia Gunby, 1000 Friends of Washington, stated that the first series of public workshops seemed to emphasize the process of the study, not the substance. The next series of public workshops should be substantive and also, the public should receive information in advance of the meeting. Noel Schoneman, City of Seattle, noted that public workshops do not always attract a larger number of people, but are a good starting point for public outreach.

Margaret Doman, Eastside Neighborhoods, suggested that a two page fact sheet or video be used to start meeting and educate the public on the study. Also, public outreach efforts should be used strategically. Tom Heller, Seattle Neighborhoods, noted that the exchange between the public an study Committee members was very helpful. The public workshops helped to draw the public into the complexity of the

problem. It was suggested that the City of Redmond "forums" be used as a model for future public workshops. Also, future workshops should ask the public to consider the impacts elsewhere of their suggested concepts.

PROBLEM STATEMENT

Doug Hurley introduced the draft problem statement attached to which were the comments heard from the public during the workshops. He asked for the Study Committee to determine whether it should proceed with the draft problem statement as currently written or suggest changes to the problem statement based on the public input. Bob Gillespie, Eastside Business, stated his opinion that the Study Committee should not spend additional time considering the problem statement, but should move forward. Virginia Gunby noted that new material has been introduced to the Study Committee, and according to its ground rules, the group should not take action on the problem statement until its next meeting. The public comments need to be taken into consideration.

Bob suggested that the public comments be considered as an appendix to the problem statement to which public input can continually be added. Daryl Grigsby, City of Seattle Department of Transportation, expressed his desire to move forward with the problem statement, but recognized the need to consider public input. He suggested that the Study Committee reconsider the problem statement briefly at its next meeting. Doug Hurley noted that the problem statement will be used to match potential concepts and solutions back to determine their responsiveness.

After additional discussion, the Study Committee agreed to reconsider the problem statement at its November 4 meeting. A revised version will be sent to the committee in its next mailing. All suggested changes should be forwarded to EnviroIssues by Friday, October 16.

POTENTIAL CONCEPTS

Jeff Peacock introduced the potential concepts that have been suggested by the Study Committee and members of the public to date. They have been consolidated into 4 categories: transit, roadways, enhancement and mitigation, and demand management and land use. All of the potential concepts have been described at comparable detail, but the technical team needs to hear from the Study Committee whether the level of detail is adequate. The technical team has also suggested dropping several concepts because either they did not know enough about the suggested concept to describe it, the concept did not appear to address the problem, or the concept is already being included in another planning process. If Study Committee members can tell the technical team what some of the concepts that are suggested to be dropped mean, the technical team will then go ahead and describe them.

Jeff reviewed the list of concepts, briefly describing which corridor they would fit in and what the potential concept was. Jim Horn expressed concern that the concept of personal rapid transit was being dropped. Jeff explained that the technical team did not at first understand what personal rapid transit was and suggested dropping it from the list. Since the list was mailed to the Study Committee, more research has been done, a description written, and the technical team is proposing to keep it on the list. Bob Gillespie questioned why some transit concepts were left in the roadway category. Jeff responded that, for example, HOV lanes are left in the roadway category because they will be evaluated in terms of traffic and physical impacts similar to other roadway concepts.

Maynard Arsove questioned whether WSDOT has any plans or studies relating to HOV lanes on SR 520. Jeff noted that any plans would be made available to the Study Committee. Chuck Mize, King County, questioned whether the study on I-405 might be considering some of the potential concepts and thus the Trans-Lake Washington Study would not have to consider them. Renee Montgelas, WSDOT, responded

that the I-405 study will not be complete for another 18 to 24 months, beyond the Trans-Lake Washington Study, and so results will not be available to the Study Committee. However, system integration will need to be considered, even when the timing for different projects varies.

A Study Committee member suggested that a subcategory be added to each of the categories which would identify missing links and other concepts that could be addressed in the near term. Eugene Wasserman, Seattle Business, noted that the concept of adding a direct connection between the University of Washington and SR 520 (R-15) should also include single occupancy vehicles. Maynard Arsove asked for information on how an HOV lane on SR 520 would be connected to I-5 and the technical difficulties that are encountered. A suggestion was made to add an HOV expressway as an additional concept to be considered.

Paul Cowles, North Lake Business, asked that the technical team provide detailed reasons on why potential concepts are being dropped off the list. Jeff Peacock agreed that that information would be included in the screening process. Study Committee members should also remember that potential concepts can continue to be added to the list as the process moves forward.

Alan Borning, ALT-TRANS, asked that non-motorized modes of transportation be considered as a mode, not as an enhancement. Bicycle and pedestrians pathways do serve to move people from one place to another. Jeff agreed that non-motorized modes are a method of transportation, but expressed concern that when compared against a new roadway, bicycle and pedestrian pathways will always be providing less capacity. He suggested that he and Alan meet to discuss how non-motorized forms of transportation can be considered a mode, without being compared directly to roadways and transit.

Mark Weed suggested that some of the potential concepts are actions that can be taken now and show an immediate impact on the transportation system, rather than waiting until the end of the study. Paul Cowles expressed his concern with that option by noting that every concept needs to be given equal weighting and considered together throughout the study. Ward Truess, Eastside Transportation Committee, noted that a potential concept should include subsidizing carpooling in order to increase the number of people using that option. Virginia Gunby noted that demand management and land use appear not to be going through the screening process and that time could be spent meeting with local governments to learn about their planning policies as well as hear more about the assumptions used in the LUTRAQ study. Jeff explained that land use and demand management concepts are not being set aside, but rather being more fully developed before they move through the screening process.

John Okamoto, WSDOT, questioned whether or not enhancement concepts needed better descriptions before they could move through the screening process. Jeff responded that, for example, noise walls need to be considered in conjunction with a specific place or project, and so more information is needed before they can move through the screening process. John stated his opinion that the screening process needs to better accommodate non-projects and enhancements need to be looked at incrementally, either by adding them to another potential concept or looking at them independently. Also, non-motorized concepts should be taken through the screening process as a mode of transportation.

WHAT ARE WE WORKING TOWARDS AND HOW ARE WE GOING TO GET THERE?

Rob Fellows, WSDOT, presented to the Study Committee a simplified road map of the study process as well as options for screening and evaluating potential concepts. Any comments that the Study Committee has on the road map, or screening and evaluating potential concepts are welcome and should be given to Rob. The evaluation methodology is continually evolving. The technical team is proposing to screen the concepts in November and December and then evaluate the remaining concepts in early 1999.

The roadmap has been changed slight to allow for the Study Committee to begin strategizing with potential concepts in the November to December timeframe, allowing the technical team more time to describe and screen potential concepts. The additional change has been to have three meeting at which concepts are presented and an all day (or evening) workshop in February. The concepts will begin to be packaged into solutions in the February to March timeframe which will then require additional technical team evaluation.

Aubrey Davis questioned what was the role of the MTP and the assumptions that it makes about growth and the location of that growth. Also, some of the potential concepts have already been considered and addressed in the MTP. Rob suggested that a more thorough discussion of the MTP could occur in November and what projects it does and does not include. A suggestion was made that "do nothing" is not the baseline, rather the MTP is the baseline. Summaries of the MTP will be provided to the Study Committee.

Eugene Wasserman expressed concern that the technical work is ongoing without adequate Study Committee understanding or input in that process. He suggested that a technical review team be made up of Study Committee members who are interested in technical issues. Bob Gillespie expressed his opinion that it is incumbent upon Study Committee members to contact the technical team when they have questions about the work being accomplished. Doug Hurley noted that a subcommittee would be a change in the approach and asked for Study Committee support for the concept. There was not enough support to carry the idea forward and it was suggested that it be kept in mind as the study progresses. Donovan Tracy suggested that it is difficult to understand how the Study Committee will function during the screening process; it appears that a decision process is missing. The committee should serve as a sounding board for the technical team and look for a common theme and goal that can guide the technical team.

Rob Fellows introduced the concept screening approach, including a proposed template for the technical team to use in its screening. He asked the Study Committee whether there was agreement that the technical team should proceed with the screening and rate the proposed potential concepts and whether the template would provide adequate information to the group at this phase of the study. A suggestion was made to include a time scale in the description of the specific concepts as well as start grouping concepts into obvious solutions. Another member suggested that a potential concept's compatibility with existing policies be included in the template. Rob Fellows expressed concern that the technical should be ensuring that the Study committee understands existing policies and impacts, but not assessing their compatibility with the potential concepts. John Okamoto, WSDOT, identified his preference for having the technical team identify relevant policies.

A Study Committee member suggested that references be added to the template for the information used to make the screening determinations. It was also suggested the template include identification of critical links that will be necessary to ensure the proposed concept will work. The Study Committee agreed that the technical team could move forward with the screening of potential concepts, using the template proposed and the suggested changes mentioned above.

Rob Fellows then asked the Study Committee to review the proposed concepts evaluation approach and determine whether the questions outlined for the different modes are adequate for answering the Study Committee's questions. Aubrey Davis questioned whether potential concepts, such as light rail on I-90, should be considered further by the Study Committee when that concept is being explored by another agency or program. Bob Gillespie responded that if SR 520 is at capacity, then overflow goes to I-90 and should be considered by the Trans-Lake Washington Study. Jeff Peacock noted that the screening process will determine the concepts that have merit. The evaluation phase will pull from existing information to further study those concepts that remain "on the table."

PLANS FOR NEXT MEETING

Agenda items for the next meeting will include:

- Reach agreement on draft problem statement
- Presentation of information on the MTP, including funded and unfunded activities relating to the Trans-Lake corridor
- Review of screening results

Eugene Wasserman requested that a discussion concerning an origin and destination study be added to the next meeting agenda. Doug Hurley noted that Paul Cowles drafted a suggested proposal for forming a steering committee which was distributed to the entire Study committee. Because members are still discussing the proposal and potential ways to form the steering committee, it was suggested and agreed that it will not be taken up until there is general agreement among members.

Eugene Wasserman requested that the Study Committee not hold a December meeting due to scheduling conflicts, holidays, and the need for the technical team to spend time screening and evaluating potential concepts. Donovan Tracy noted that Sound Transit has been absent from many of the meetings and requested that a follow up call be made to ensure their involvement.

The following meetings for the Study Committee have been scheduled:

• Wednesday, November 4 12:00 p.m. to 4:00 p.m.	Museum of History and Industry, 2700 24th Avenue East, Seattle
• Wednesday, December 2 12:00 p.m. to 4:00 p.m.	Museum of History and Industry, 2700 24th Avenue East, Seattle

SUMMARY OF ACTION ITEMS

- Provide all public input in total form to the Study Committee.
- Provide information on the monorail initiative.
- Provide information on the use of an underground tunnel for light rail by Sound Transit.
- Provide a reference list of relevant information, not every article every time.
- Provide summaries of the MTP to the Study Committee with staff overview of assumptions and gaps.
- Continue to consider need for origin and destination survey.
- Consider canceling the December meeting.

MEETING HANDOUTS

- Revised Draft Study Committee Meeting Agenda
- Trans-Lake Washington Study Public Workshops Summary
- Draft Problem Statement, September 3, 19998 with Input from Public Workshops
- Maps of Roadway, Transit, and Demand Management and Land Use Potential Concepts
- Evaluation Methodology: A Continuing Evolution
- Definitions Used in this Study
- Draft Concepts Screening Approach
- Draft Concepts Evaluation Approach

MEETING ATTENDEES

Members

Nancy Adams	T.R.U.S.T.
Jean Amick	Seattle Neighborhoods
Maynard Arsove	No Expansion of 520
William Backlund	Washington Legislature
Doug Baker	Washington Trucking Association
Richard Conlin	City of Seattle
David Cortelyou	Seattle Business
Paul Cowles	North Lake Business
Aubrey Davis	Washington Transportation Commission
Margaret Doman	Eastside Neighborhoods
Bob Edwards	Puget Sound Regional council
Maggi Fimia	King County
Nona Ganz	City of Kirkland
Peggy Gerdes	North Lake Neighborhoods
Bob Gillespie	Eastside Business
Daryl Grigsby	City of Seattle
Virginia Gunby	1000 Friends of Washington
Tom Heller	Seattle Neighborhoods
Jim Hill	Eastside Business
Jim Horn	Washington Legislature
Rosemarie Ives	City of Redmond
Ken Jacobsen	Washington Legislature
Doug Jacobson	City of Lake Forest Park
Jean Leed	Seattle Neighborhoods
Richard McIver	City of Seattle
Rob McKenna	King County
John Okamoto	Washington Department of Transportation
Doug Pullen	Highway Users Association
Rick Pusateri	Eastside Business
Janet Ray	AAA
Phil Rourke	Points communities Neighborhoods

- Scott Rutherford — University of Washington
- Donovan Tracy — Eastside Business
- Ward Truess — Eastside Transportation Committee
- Eugene Wasserman — Seattle Business
- Raleigh Watts — Seattle Neighborhoods
- Mark Weed — Seattle Business

Alternates

- Alan Boring — ALT-TRANS
- Maurice Cooper — Seattle Neighborhoods
- Peter Dewey — University of Washington
- Kingsley Joneson — Seattle Neighborhoods
- Connie Marshall — City of Bellevue
- Jim MacIsaac — Eastside Transportation Committee
- Chuck Mize — King County
- Dave Russell — Puget Sound Regional Council
- Noel Schoneman — City of Seattle
- Larry Springer — City of Kirkland
- Doug Schulze — Points Committee
- Ed Waitaj — City of Seattle
- Dick Taylor — King County
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of 520

Seats Not Represented

- Mary Gates — Sound Transit
- Peter Orser — City of Mercer Island
- Debbie Treen — City of Bothell
- Cynthia Sullivan — King County

Public, Media

- Jim Arndt — City of Kirkland
- Daniel Bray — T.R.U.S.T.
- Doug Dixon — Guido Perla & Associates
- Vicki Fabre — Washington Transportation Commission
- Mark Hallenbeck — TRAC
- David Hull — King County Department of Transportation
- Linda Holman — Van Waters & Rogers
- Jim Klockow — Eastside Journal
- Tracy Krawczik — City of Bellevue
- Barbara Roberts — King County Councilmember Cynthia Sullivan
- Doug Varrick — Greater Seattle Chamber of Commerce

DRAFT MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MUSEUM OF HISTORY AND INDUSTRY, SEATTLE
NOVEMBER 4, 1998 12:00 P.M. TO 4:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

The Trans-Lake Washington Study Committee held its sixth meeting at the Museum of History and Industry in Seattle. Pat Serie, EnviroIssues, reviewed the agenda topics, which included adoption of the draft problem statement, discussion of the concept screening process, reviewing the Metropolitan Transportation Plan and its relationship to the Trans-Lake Study area, and roundtable discussions on strategy development.

PUBLIC COMMENT

Henry Paulman, T.R.U.S.T., commented that letters have been sent to WSDOT and committee members urging that an origin/destination study be conducted. He feels strongly that the study should have been instituted early in the process so that valid and current data can be used in evaluating potential concepts. He also felt that the Puget Sound Regional Council's (PSRC) models being used are not current and should incorporate new demographic studies. He concluded that a completed origin/destination study would have widespread application throughout the study.

Gill Eade expressed concern that the environment was not being sufficiently recognized as an issue, as evidenced by changed between the first and second draft problem statements. The new language, which emphasizes "minimization and mitigation" of environmental harm as a goal, is too open-ended. Mr. Eade also suggested that public comments received prior to these changes indicated an overwhelming concern with environmental impacts, but the current list of concerns does not adequately reflect them. He urged that the improvement of the environmental quality of neighborhoods be included as a parameter in the committee's problem statement.

ADOPTION OF DRAFT PROBLEM STATEMENT

Pat Serie introduced the revised draft problem statement which included suggested changes by Study Committee members that reflected input heard from the public during the public meetings. The problem statement is meant to serve as a check point as the group develops its solutions, which will most likely be a hybrid of tools put together to address the problems.

The suggested changes to the draft problem statement were discussed, with the following changes agreed to by the Study Committee:

- The first sentence under the section titled "The Transportation System Suffers from Extensive Congestion" will now read "Vehicle miles traveled have been growing as fast or faster than the population."

- The final sentence of the draft problem statement will read: "Vehicle emissions negatively impact air and water quality throughout the region."

The Study Committee adopted the working draft problem statement with the above changes to the revisions.

WHAT ARE OUR POTENTIAL CONCEPTS? RESULTS OF INITIAL SCREENING

Jeff Peacock, Parametrix, reported back to the Study Committee the results of the initial concept screening exercise conducted by the technical team. He emphasized that the concepts are building blocks for strategies and solutions, and that the technical team's task in conducting the screening exercise was to focus its time and resources on the most promising concepts. The potential concepts proposed for moving forward into evaluation include approximately 35 roadway concepts and 11 transit concepts. Jeff emphasized that the technical team's recommendations were not final, and are being provided to the Study Committee for full review and comment. Committee members who feel strongly about reintroducing concepts that were screened out, or excluding ones that were included, are incited to provide written feedback to Jeff. The Study Committee will discuss the screening process in more detail at its November 18 meeting.

The Study Committee discussed the following issues:

- What was the basis for elimination of items from the list? Jeff explained that effectiveness was the main criterion used, but that cost and impact were also evaluated. Mobility was the primary focus of effectiveness discussions. Jean Leed, Seattle Neighborhoods, expressed concern that mobility was being used as a major criterion in eliminating concepts, and that concepts should not be eliminated based on one criterion.

- What are the procedures for getting excluded concepts back on the list, or excluding concepts currently on the list? Jeff explained that suggestions should be forwarded to him between now and the November 18 meeting and then time will be spent at the next meeting discussing in more detail specific comments.

- Can permutations of eliminated concepts be included in the evaluation process? Jeff explained that the technical team would certainly test any permutation of potential concepts that have the potential to fit within a final strategy. Pat Serie noted that permutations of potential concepts can be added as the committee's work progresses.

METROPOLITAN TRANSPORTATION PLAN: WHAT DOES IT MEAN FOR TRANS-LAKE?

Jeff Peacock, Parametrix, presented a summary of the Metropolitan Transportation Plan (MTP), and its policy and strategic implications for the Trans-Lake Washington Study Committee. The MTP has in place a Systems and Transportation Demand Strategy which favors compact centers1and reduced auto dependency. The centers are proposed to be linked by high-capacity transit. Jeff explained that the MTP prioritizes investments, and that maintaining the existing transportation system in the Puget Sound region is the MTP's top priority. The major emphasis of the MTP is on moving people and goods, not automobiles. The cost of implementing these improvements is $66 billion and currently faces a $16 billion shortfall. A breakdown of the costs and financing for the MTP shows funds going toward city streets, county roads, public transit, state ferries and state highways. Several strategies included in the MTP already have projects in place, and the Trans-Lake Study Committee should keep this in mind when moving forward with their proposals. The MTP includes transit projects which are sponsored by Sound Transit, both in that agency's 1996 voter approved plan and its long-range vision. There are also roadway projects which are sponsored by WSDOT and include both candidate and approved projects. The east-west corridors are the main focus of these projects, although projects are also planned for I-5 and I-405.

Specifically, the MTP identifies adding HOV lanes to SR 520, but this is a candidate project and will be part of the Study Committee's discussions.

Jeff explained that the MTP includes a number of predictions for the region's transportation demand, including a threefold increase in travel delay throughout the region as the population increases; a 50 percent increase in vehicle miles traveled; a 50 percent increase in transit of transportation usage by 2020; a 40 percent increase in total trips taken; a 35 percent increase in total vehicles; and a doubling of congestion throughout the network. Jeff noted that all of these expectations of transportation demand are based of full implementation of the MTP.

The committee discussed the following issues:

- Are van pools included in the assumption regarding transit use increases? Jeff responded that he believes it includes only bus routes and rail.

- What are the Transportation Demand Management (TDM) assumptions? Jeff explained that they are fairly conventional. He added that it is not a very ambitious TDM strategy, and that the MTP builds out the supply side without imposing policy constraints.

- Is the TDM based on a five-day work week scenario? Jeff responded that the model assumes the five-day work week scenario.

- Are there any TDM assumptions specifically for the SR 520 corridor? No, the TDM models use a regional average. Were there additional data developed to look at more aggressive modeling of TDM? Jeff responded that that information was included in the reference guide distributed to the Study Committee.

- Were additional data developed to look at more aggressive modeling of TDM? Jeff responded that information was included in the reference guide distributed to the Study Committee.

- What is the impact of the MTP on Seattle neighborhoods; will roadways continue to bring cars onto already congested city streets? King Cushman, PSRC, explained that the MTP's performance measures projected that the increase will occur on local arterials, and that over time, Seattle streets won't get much worse.

- Has the work done thus far assumed that things will happen on SR 520? Jeff explained that the MTP models assume HOV lanes on SR 520. How HOV lanes would be place on SR 520 is still undecided.

- What percent of the focus on the MTP is on SR 520?

- Why are the private costs of owning a vehicle and using the roads not included in the cost estimates? It is misleading to not include them in terms of public decision-making.

- An attempt should be made to quantify the implicit costs of congestion (i.e. travel time wasted)

- A suggestion was made to separate out vans, buses and carpools from the MTP's trip projections for 2020

- Another suggestion was made that freight and SOV should be looked at separately.

- The percentage breakdowns used to describe public transportation should be clarified. While transit may only accommodate 6 percent of the trips, it does accommodate a larger percentage of the peak hour trips.

- How will the different types of traffic on SR 520 (i.e. commute, shopping) be accommodated for in the models?

LET'S GET DOWN TO WORK: BEGINNING STRATEGY DEVELOPMENT

Doug Hurley, CH2M Hill, used the MTP as an example of a strategy that the Study Committee will be asked to develop during their roundtable exercises. He used a matrix to outline the different components of the MTP, including land use, corridors, mode, and mitigation and neighborhood enhancements. A strategy that might be developed by the Study Committee might be a hybrid of those different components.

After breaking into roundtables, the Study Committee members discussed elements of potential strategies and attempt to construct one or more strategies. They reported back on the discussions at each of their tables as summarized below. A more detailed summary of the discussion is available from the staff.

Table No. 1 – "Holistic Balanced Choice"

Any solution must be multi-modal, must serve demand, and must preserve and protect choice. It must also recognize the economic and social parameters that have to be dealt with. A strategy should be complete. There needs to be a more general-purpose capacity, and the freight integrity of I-90 must be maintained. Finally, I-90 should not lose its HOV capacity to light rail.

Specific Issues

Land Use – There should be an emphasis on current, traditional methods, but incentive programs should be added.

Transit – Maintain choice – ferry, bicycle, etc. Do not look at these to absorb the total number of trips in a given day- they should be counted as trips themselves. Transit should be targeted and high yield.

Table No. 2

Achieving the MYP will be difficult. There was general consensus in the group that there should be convenient and reliable choices, but some divergence of opinion on whether improvements should be concentrated on SR 520 or be spread around. There was also a divergence of opinion on whether congestion pricing is the answer, and how much general purpose/demand should be accommodated. There was further agreement on the issues of a light rail system serving the eastside (the group agreed that there should be at some point in the future). The group felt that the HOV gap in this eastside area needs to be filled, and that bike crossings should definitely be part of any solution. Mitigation will of also be a part.

Specific Issues

Land Use – These issues should be taken seriously.

Table No. 3 – "Everything and Heaven, Too"

The MTP should be used as a baseline for resolving problems, and not as a document set in stone. A lot needs to be done in every category. A solid cost-benefit analysis should be done.

Specific Issues

Land Use – There should be increased emphasis on targeted growth, and continued emphasis on density and transportation, since there is a relationship between the two.

Demand Management – There was a lot of discussion on the topic of flattening the peak period, and of offering more incentives. Also, there was discussion about encouraging more people to work at home. Tolls were also discussed as an option. Most group members are not in favor of congestion pricing.

Pedestrian and Bicycle – There need to be neighborhood connections.

Transit – Transportation options on the SR 520 corridor should be enhanced. The group discussed the possibility of putting a rail system there, or creating a new bridge for the rail. They also discussed the inadequacies of I-90, and of keeping the ferry option alive as part of the mix.

SOV – The group agreed that there should be a reduction of congestion beyond that called for in the MTP. Most agreed that an additional lane or lanes would reduce traffic on I-5 and I-405.

Table No. 4 – "The Whole is Greater than the Sum of its Parts"

Specific Issues

Land Use – There should be incentives for creating higher density areas. Policies should be changed to allow multifamily units to be sited close to commercial properties. Retrofitting land use policies is difficult.

Pedestrian and Bicycle – Safety is a big issue for bikes. Even with the amenities, people are not riding (example given of SAFECO building, and addition of showers which has not resulted in a corresponding increase in bicycle usage). If an additional bike lane cannot be installed, then perhaps more bikes could be accommodated on transit.

Transit – A suggestion was made to have a continuous public transportation route including serving Kenmore and University District. The group also discussed adding rail in both the I-90 and SR 520 corridors, with an emphasis perhaps on I-90. They also discussed the issue of dedicated lanes for HOV, and the possibility of letting freight use HOV lanes during non-peak hours to reduce congestion. There was no consensus on converting from SOV to HOV.

SOV – There was a general lack of agreement on this issue – the group did feel that lanes should be maintained each way.

Table No. 5

There was a lot of agreement on a variety of issues. Everyone felt that a "mixed bag" strategy was important. The backbone of such a strategy should be the upgrading of the SR 520 corridor so that it has shoulders, bike facilities, and HOV lane that could later be transitioned to rail system, etc. There was a general feeling among the group, however, that a lot of what can be done has already been done.

Specific Issues

Demand Management – This group felt that a lot of what can be done in this area has been done, i.e., GMA and CTR. However, they felt that congestion pricing is a strategy that could make a difference, as could an increased emphasis on telecommuting, carpooling and van pooling. In addition to adding and HOV lane on SR 520, there needs to be a flexible ridesharing program. There should also be an HOV network with freeway to freeway connectors.

Bicycling – There needs to be bike path continuity and pedestrian connections within and between communities.

Table No. 6

Specific Issues

Land Use – Long-term planning should be thoroughly evaluated. One of the biggest issues is that everyone is passing the buck. Incentives need to be put into the program so that cities and communities have money to move forward.

Demand Management – The group discussed the possibility of selective user fees and/or subsidies, and congestion pricing.

Pedestrian/Bicycle – This should be treated as a mode of transportation in and of itself. General consensus among the group that there needs to be more accommodation of bicycles and pedestrians throughout the region.

Transit – More capital funds should be put into this area. This means that we might have to take a risk to make a commitment without assurance of immediate success, i.e., implement it and if it runs empty for a while, so be it. The group also suggested that the monorail should be taken more seriously as a strategy to reduce congestion.

Car and Vanpool – More emphasis should be placed in this area. We should be increasing incentives around the car/van pool idea. Businesses and municipalities should be worked with in order to come up with a solution.

PLANS FOR NEXT MEETING

Pat Serie, EnviroIssues, asked whether the staff could take the ideas discussed at the roundtables and compile them into a summary that can be discussed further at the November 18 meeting. The group responded that:

- The group should focus on objectives so that it can get closer to some alternatives
- Although the group may have consensus on strategies, there still exists a diversity of opinion regarding implementation of those strategies.
- Will these strategies be analyzed against a set of criteria? Modeling and analysis must be done to incorporate the changes that will occur during the next five, ten years, etc.

Pat recommended that committee members think about what information will be needed in order to turn strategies into solutions.

The meting scheduled for December 2 has been rescheduled for November 18 from 1:00 to 5:00 p.m. at the Museum of History and Industry (2700 24th Avenue East, Seattle).

PUBLIC COMMENT

Barbara Roberts suggested adding bus ferries as a potential concept. The value of bus ferries would be a chapter form of ferries compared to regular ferries because people would stay on the buses, and there would be need for upper platforms. Also, the waterfront area would not be as impacted because there would be no need for parking or turnarounds since the buses would load directly onto the ferries.

ACTION ITEMS

- A copy of the PSRC's TDM strategy will be distributed to the Study Committee

MEETING HANDOUTS

- Strategy development Exercise
- Metropolitan Transportation Plan Reference Guide
- Concepts: Building Block for Solutions
- Memo from Jim MacIsaac Re: Trans-Lake Study – Technical Problem Statement
- Correspondence between Rob Fellows to Henry Paulman Re: Trans-Lake Study Area Origin/Destination Studies
- E-Mail from Alan Borning to Jeff Peacock Re: October 7 Trans-Lake Meeting Summary Correction
- E-Mail from Tom Heller to EnviroIssues Re: October 7 Trans-Lake Meeting Summary Correction
- Sub-centring and Commuting: Evidence from the San Francisco Bay Area 1980-90

MEETING ATTENDEES

Members

• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of SR 520
• Dan Becker	Point Communities
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Peggy Gerdes	North Lake Neighborhoods
• Bob Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods

- Jim Horn — Washington Legislature
- Rosemarie Ives — City of Redmond
- Ken Jacobsen — Washington Legislature
- Jean Leed — Seattle Neighborhoods
- Connie Marshall — City of Bellevue
- Ed Murray — Washington Legislature
- Phil Noble — Eastside Neighborhoods
- John Okamoto — Washington Department of Transportation
- Peter Orser — City of Mercer Island
- Doug Pullen — Highway Users Association
- Rick Pusateri — Eastside Business
- Phil Rourke — Points Communities Neighborhoods
- Scott Rutherford — University of Washington
- Donovan Tracy — Eastside Business
- Eugene Wasserman — Seattle Business
- Raleigh Watts — Seattle Neighborhoods
- Mark Weed — Seattle Business

Alternates

- Alan Borning — ALT-TRANS
- Maurice Cooper — Seattle Neighborhoods
- Peter Dewey — University of Washington
- Roy Francis — King County
- Kingsley Joneson — Seattle Neighbrohoods
- Roz Liming — Eastside Business
- Jim MacIsaac — Eastside Transportation Committee
- Dave Russell — Puget Sound Regional Council
- Andrew Schmid — King County
- Noel Schoneman — City of Seattle
- Doug Schulze — Point Communities
- Ed Switaj — City of Seattle
- Dick Taylor — King County
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of SR 520

Seats Not Represented

- Bill Backlund — Washington Legislature
- Doug Baker — Washington Trucking Association
- Mary Gates — Sound Transit
- Doug Jacobson — City of Lake Forest Park

Public, Media

- Ken Barr
- Mike Cummins — WSDOT–OUM

• Philip F. Grega	
• F.W. Holtz	
• Terry Marpert	City of Redmond
• Nancy McCormick	ETP
• Bruce Nurse	Kemper Development Company
• Jean O'Connor	League of Women Voters
• Barbara Roberts	King County Councilmember Cythia Sullivan
• John Shadiff	WSDOT-OUM
• Rich White	Bellevue Chamber of Commerce

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
BELLEVUE BEST WESTERN, BELLEVUE
JANUARY 6, 1999 1:00 TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

The eighth meeting of the Trans-Lake Washington Study Committee was held at the Best Western Hotel in Bellevue. Pat Serie, EnviroIssues, reviewed the agenda topics which included a presentation of potential solutions from the technical team, roundtable discussion of the solution sets, and an overview of the technical work plan for analyzing potential solutions. Pat stated that the focus of the Study Committee would be shifting toward analysis of the potential solutions in the coming weeks.

PUBLIC COMMENT

Maynard Arsove expressed concern over the current solutions for expanding SR 520. He feels that the situation is very complicated and that the current plans do not address the traffic problems in the outlying areas of Seattle, but rather simply transfer traffic problems into the city. He questioned the complications involved in connecting proposed HOV lanes on SR 520 to I5, how beneficial additional lanes would be on SR 520, and the issue of high-level cross over lanes on the SR 520 bridge.

Leonard Newstrum explained that he had written a proposal outlining a Trans-Lake Monorail and identifying intelligent vehicle concepts. He urged them to read the document and to react positively or negatively to the ideas. He feels that newer technologies need to be considered in a solution, as the "tried-and-true" methods are not working well.

Wes Larson, resident of Eastlake community, voiced concern over noise and pollution problems associated with I5 and rising traffic volumes. He stated that the stretch of I5 running through the community behind Montlake is the noisiest in the state. In addition, he stated that the high volumes of traffic traveling northbound in the express lanes over the Ship Canal bridge creates a vast amount of noise in one of the densest neighborhoods in Seattle. He recommended that the committee examine mitigation and work with WSDOT to ensure that noise reduction and pollution runoff measures be implemented in a traffic solution for the SR 520 bridge.

Henry Paulman, T.R.U.S.T., commented that the discussion set aside later in the meeting for origin/destination surveys was important. He reminded the committee to examine how the data used in modeling was updated, and to understand the model demonstration.

Chris Leman, Eastlake Community Council, expressed concern over the restriction of flammable cargo vehicles on I-90. He stated that the design limit on I-90 that restricts flammable vehicles was wrongly implemented by WSDOT without public comment. He would like to allow these vehicles to use I-90, thereby alleviating traffic pressure on SR 520. Mr. Leman also recommended that the implementation of rail be studied only on SR 520 rather than on both I-90 and SR 520.

Kingsley Joneson, Seattle Neighborhoods, commented that the letter from the Seattle Transportation Committee expressing support for additional general purpose lanes across SR 520 was contrary to the views of many of the Seattle neighborhood.

SOLUTIONS TO ADDRESS STRATEGIES

Jeff Peacock, Parametrix, reported that the technical team examined the strategies and themes expressed in the November 18 meeting, looked at their relationship to each other, and developed a number of potential solution packages. The details of each solution are still being investigated, but the strategies previously discussed by Study Committee members were incorporated in the potential solution sets. Land use and demand management were limited to one solution package, even though the topics will eventually stretch across to all solution sets. Demand management concepts proposed are consistent with the Metropolitan Transportation Plan (MTP). Jeff explained that enhancements added to the potential solution packages are still general and that details would be added in the next two months.

Jeff provided a brief summary of the seven potential solution packages including the options that made each distinct from the others. Once the Study Committee heard information on each of the packages, Pat Serie explained that the group would break into roundtable discussion groups where a technical team member would explain each package in more detail. Members were given their choice of table and solution package to discuss.

Some Study Committee members expressed concern about the lack of criteria for evaluating the potential solution packages and wanted to understand the process for analyzing the technical team's work to make decisions. Jeff explained to the committee that the technical team was seeking input to know which options members supported before continuing to the analysis stage. Maggie Fimia, King County Council, expressed her opinion that a better method of evaluating the solutions would be for the technical team to incorporate factors such as cost, environmental mitigation, and technology options into the packages for the committee to base decisions on. She noted that packages could be discarded now, that would actually be reasonable and feasable, because they did not have all the facts to base decisions on. Her feelings were echoed by several members of the committee who felt that details regarding cost, land use, and environmental impacts were needed before any further decisions and progressive discussion were reached.

The following issues were also raised by the Study Committee:

- What is the percentage of people using the SR 520 corridor?
- How does the Study Committee interface with the Sound Transit decision on rail in February?
- "Fatal flaws" in solution sets need to be defined so that informed decisions can be reached by the Study Committee.
- How flexible are the corridor locations and connections?
- Cost estimates are needed before the committee starts to analyze the solutions provided by the technical team.

CHOOSE YOUR OWN SOLUTION ROUNDTABLE EXERCISES – ARE THESE THE RIGHT SOLUTIONS FOR FURTHER EVALUATION?

The Study Committee formed roundtables to talk with the technical team and provide input about strengths and weaknesses they saw in the various solutions. Members chose the table they participated in based on the potential solution set.

A representative from each roundtable provided a synopsis of the discussion. The technical team was given feedback on the potential solutions and any changes that the committee members saw in the solutions were noted. The following is a brief description of the changes suggested for each potential solution set. These recommendations will be used by the technical team to refine the solutions prior to further analysis.

Table No. 1 – "Everything and Heaven A"

The roundtable felt that rail should be studied in both the I90 and SR 520 corridor. They stressed the importance of examining all options as well as rail, including HOV lanes and regional bus service in both corridors. They recommended that the solution contain some language stating "no rail on I-405," and that the use of rail should concentrate in urban centers and communities in the south end. In addition, more emphasis should be placed on developing the regional bus service. The group did not want the technical team to rule out any options that could be used to improve transportation in the I-405 corridor in the future.

Table No. 2 – "Everything and Heaven B"

The roundtable suggested that a balance between rail and general purpose facilities is needed in this solution. The team was not divided on the issue of creating a new corridor between Sandpoint and Kirkland. Instead of completely eliminating the idea, to be fair to the process, the team suggested continuing research regarding costs, impacts, etc. In regards to roadways, the roundtable wanted to examine HOV lanes on SR 520, as well as the idea of HOV and 4 general purpose lanes in a tunnel in the SR 520 corridor. The use of rail in a looping system around Lake Washington appealed to the roundtable and they wanted the idea carried forward, as well as an examination of both the I-90 and SR 520 corridors for rail. The new corridor examination should include both a tunnel and bridge option.

Table No. 3 – "MTP/MTP Modified"

The group felt that the two solution sets should fold into a single set. Suggestions for improvement in the MTP include adding transit to the SR 520 corridor and the need to keep all corridors open to the option of expanding the transit system. Improvements to roadways include adding HOV lanes on SR 520 and I-90, and strengthening the SR 522 connection as a third corridor. Kingsley Joneson, Seattle Neighborhoods, added that an examination of removing the flammable exclusion and improved interchanges at I-5 and SR 520 should be included.

Table No. 4 – "Rail to Eastside"

Alan Borning reported to the Study Committee that the option of rail should be folded into the other potential solution sets to see how its addition would change transportation patterns over the next 50 years. The group did not want the corridor from Sandpoint to Kirkland to be pursued with regards to rail. They felt the option of adding rail across the lake should continue on the west side to Ballard. More work on looking at a tunnel under the lake and a submersed floating tube should be done. By eliminating the Sandpoint to Kirkland corridor, there is no need for this solution package as most of its concepts are included in others.

Table No. 5 – "Roadway/Bus"

The roundtable supported carrying all options of this package forward with more information on cost. Additions to the potential solution set include: straightening SR 522, major improvements in the transit system on SR 520, and an improved connection on 148th to relieve congestion on the eastside. The roundtable wanted information on predicted transit ridership numbers, and suggested that cost be

considered as a ratio of transit to SOV lanes. Grade separation was suggested to increase the velocity through high density areas.

Table No. 6 – "Maximize Alternatives"

The roundtable commented that the land use topic should either be separate or in all solutions as it is a challenging topic and related to all solution packages. In regards to roadways, the addition of a bus-only lane or HOV lane on SR 520, or conversion of an SOV lane to HOV lane was suggested. Lastly, the roundtable asked that only one corridor across the lake to be considered as an option for rail.

TECHNICAL WORK PLAN FOR REFINING AND ANALYZING POTENTIAL SOLUTIONS

Jeff Peacock began a discussion with the Study Committee concerning the technical work plan for analyzing the solution sets. Plans call to finalize the evaluation criteria in March. The data which will be used in the model include engineering data, aerial photos, GIS maps to look at possible effects of adding corridors, environmental concerns, and cost.

Cathy Strombom, Parsons Brinckerhoff, presented concepts of modeling and the benefits associated with modeling relating to the Trans-Lake Study. The types of information available from a Puget Sound Regional Council (PSRC) model include: trip types, trip distribution, mode of travel, and traffic assignments. She explained that modeling can show how trips could redistribute due to accessibility changes, changes in mode of travel, changes in the use of routes, volume/capacity on roadways, and system measures of travel and delay.

A discussion of origin/destination surveys was led by Rob Fellows. He explained to the Study Committee that the surveys can show movement of the existing system, validate the transportation model, and show the users who would benefit to changes in the transportation system. While the information gained from origin/destination surveys is valuable, it reflects existing accessibility which would more than likely change with a changed system and they do not show that future transportation may be different. In addition, the surveys must be conducted during peak travel periods with sufficient light for photographing license plates. The option of performing a limited survey in the spring was presented to the Study Committee. This topic will be discussed further by interested Study Committee members

PLANS FOR NEXT MEETING

The next Trans-Lake Study Committee meeting will be held Wednesday, February 3, from 1:00 to 5:00 p.m. at the Museum of History and Industry, 2700 24th Avenue East, Seattle.

Study Committee members decided that an all day meeting was not possible for the majority and opted for two half day meetings in February. The topics for the next meeting will be a continuation of the discussion on analyzing reasonable and feasable solutions as well as public involvement issues.

MEETING HANDOUTS

- Revised Agenda
- Table of Solutions
- Draft Potential Solution Sets
- Modeling Information (2)
- Origin/Destination Survey Explanation
- Proposal from Leonard Newstrum

MEETING ATTENDEES

Members

• Dick Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of SR 520
• William Backlund	Washington Legislature
• Dan Becker	Points Communities
• Richard Conlin	City of Seattle
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	WA Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggie Fimia	King County
• Nona Ganz	City of Kirkland
• Mary Gates	Sound Transit
• Peggy Gerdes	North Lake Neighborhoods
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Jim Hill	Eastside Business
• Doug Jacobson	City of Lake Forest Park
• Rosemarie Ives	City of Redmond
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Rob McKenna	King County
• Phil Noble	Eastside Neighborhoods
• John Okamoto	WA DOT
• Peter Orser	City of Mercer Island
• Doug Pullen	Highway Users Association
• Rick Pusateri	Eastside Business
• Janet Ray	AAA
• Phil Rourke	Points Communities Neighborhoods
• Dave Russell	Puget Sound Regional Council
• Scott Rutherford	University of Washington
• Donovan Tracy	Eastside Business
• Debbie Treen	City of Bothell
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business
• Raleigh Watts	Seattle Neighborhoods
• Mark Weed	Seattle Business

Alternates

• Alan Borning	Transportation Choices Coalition
• Rich Conrad	City of Mercer Island
• Maurice Cooper	Seattle Neighborhoods
• Mike Creighton	City of Bellevue
• Peter Dewey	University of Washington
• Roy Francis	King County
• Kingsley Joneson	Seattle Neighborhoods
• Chris Leman	Seattle Neighborhoods
• Jim MacIsaac	Eastside Transportation Committee
• Henry Paulman	T.R.U.S.T.
• Noel Schoneman	City of Seattle
• Doug Schulze	Points Communities
• Larry Springer	City of Kirkland
• Ed Switaj	City of Seattle
• Dick Taylor	King County
• Mitch Wasserman	Point Communities Neighborhoods
• Fred Watson	No Expansion of SR 520

Seats Not Represented

• Doug Baker	Washington Trucking Association
• Jim Horn	Washington Legislature
• Ken Jacobsen	Washington Legislature
• Ed Murray	Washington Legislature

Public, Media

• Chris Burris	City of Medina
• Jim Cusick	
• Nora Johnson	City of Bellevue
• Wes Larson	Eastlake Community
• Ann Martin	King County
• Pat Matteson	League of Women Voters
• Bob Minnott	RGM
• Leonard Newstrum	

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MUSEUM OF HISTORY AND INDUSTRY
FEBRUARY 3, 1999 1:00 TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie welcomed meeting participants to the ninth Trans-Lake Washington Study Committee meeting and reviewed the agenda. The Study Committee was to receive updates on the origin and destination survey, the land use work session, and proposed public involvement activities. Presentations by the technical team were to provide information on the updated potential solution packages, initial feedback on some of the concepts included in the solution packages, and provide a window into ongoing and future technical work.

Connie Marshall, City of Bellevue, and Janet Ray, AAA, asked that amendments to the January 6, 1999 meeting summary be made in the reports back from the roundtable discussions. In addition, a request was made to change the title of the potential solution set, "Everything and Heaven, Too," to something that more accurately described the solution. Pat noted that the technical team will rename the solution set and the facilitation team will make the requested changes to the meeting summary.

PUBLIC COMMENT

Jeanette Williams, Sand Point Community Liaison Committee, spoke to the committee about the seriousness of congestion around the Sand Point area. The committee would like to see impacted property restored, and wetlands, parks, and historical areas protected in an effort that would benefit the entire region. Implementation of a third bridge would ruin these plans and destroy an important historic area. The streets near Sand Point are already congested and a new bridge would create even more traffic. When questioned on her opinion of a passenger-only ferry from Kirkland to Sand Point, she responded that waterfront use around Lake Washington is limited already and developing land for ferry use would not benefit the region.

ANNOUNCEMENTS

Origin/Destination Survey

Jeff Peacock, Parametrix, proposed a modified approach to conducting an origin and destination survey which would provide some useful information to the study. This proposal includes starting at the beginning of April, videotaping license plates in one lane each direction on both I-90 and SR 522 and all four lanes on SR 520. The video taping would occur for two hours during peak periods for a couple of days a week. Results from the survey would be available to the Study Committee in mid-June. Benefits from this proposed survey were described as raising the level of confidence in the model and helping to validate the model results for both the public and Study Committee members. However, the benefits are limited and the survey will not capture total traffic volume, will not include transit riders, and does not look at all-day traffic. This survey would cost approximately $115,000. Rob Fellows, WSDOT, added that money was set aside in a contingency fund for unplanned technical activities; a large portion of that setaside will go toward completing this survey.

The following issues regarding the origin and destination survey were discussed:

- The survey does not take into account non-peak hours when there are also traffic problems. The technical team should find a way to include the non-peak hours as well as weekends.

- There is not limitless money available and if the survey is not going to provide new information, it should not be done.

- The timing of the survey is problematic considering the overall study will be completed in July.

- There was a suggestion to concentrate on single-occupancy vehicles only, as those are causing the congestion.

- It was suggested that the technical team find a way to capture the traffic coming onto city streets and into neighborhoods in the origin and destination survey.

- The survey is important because it begins to answer some of the questions that Study Committee members have raised. The cost should not be a major factor in whether or not the survey is completed.

- It was noted that a limited origin and destination survey integrated with public involvement activities would be of value. The elasticity of demand on transit use is something that would be helpful in developing potential solutions. He recommended that the questions on the survey be tailored to gather as much information from the survey as possible.

- One opinion is that the survey results would not show a large difference from what the current models are showing. He noted that using the money for the survey would mean it is not available later in the study to answer other questions that the group may have.

- The origin and destination survey is important to use when talking with the Legislature as it will either validate concerns or help show where alternative solutions are needed.

- It is important to capture the opinions of bus riders in the survey.

Pat Serie asked whether there was consensus to move forward with the origin and destination surveys. Based on concerns continued to be expressed by Study Committee members, there was not a consensus for moving forward. Pat then asked how many Study Committee members supported moving forward. The results of that were 19 supporting an origin and destination survey and 18 against. The technical team will proceed with structuring the origin and destination survey, addressing some of the concerns noted above, and will provide the Study Committee with a proposed questionnaire for further discussion. Bus ridership information will be sought from other sources and coordinated with the actual results. (Note: This vote was on a modified proposal, the earlier version of which had been discussed at previous meetings, but this specific version had not been introduced prior to this decision, as provided for in the Study Committee ground rules.)

Report on Land Use Meeting

Lorie Parker, CH2M Hill, reported that several Study Committee members met with the technical team and WSDOT staff to begin brainstorming ways that transportation demand management, including land use, can be considered in the potential solutions. A summary of the meeting was distributed. Another land

use meeting will be scheduled before the next Study Committee meeting to further discuss potential concepts. Issues that the group discussed include: recommendations about land use, congestion pricing, and car and van pools. These discussion groups are open to all Study Committee members and no decisions are made at the meetings; rather they are meant to be a place to discuss the topic in more detail than time allows at the full Study Committee meetings. Information on the date and time for the next meeting will be sent to all Study Committee members.

SOLUTION SETS: PROPOSED CONSOLIDATIONS, AND QUESTIONS TO BE ANSWERED TO DEFINE THEM

Jeff Peacock reviewed each of the potential solution sets, which incorporated changes suggested by Study Committee members at the January 6 meeting. He reminded the group that the Metropolitan Transportation Plan (MTP) and the "No Action" solution sets are the bases from which the other potential solution sets have been built. The MTP and no-action solution sets will be modeled and the results shared at the next meeting. The goal is to create a hybrid of several potential solution sets which will emerge as reasonable and feasible solution sets. Some of the suggestions that were incorporated into the other potential solution sets include the following:

Everything and Heaven, Too "A" – The following changes were made to this potential solution set: addition of HOV and GP lanes; reviewing geometry within the SR 520 corridor; examining interchange modifications; adding lanes and signal heads at stoplights; giving advantages to HOV lanes; looking at effects of expanding the corridor; and identifying problem intersections. Jeff also suggested the technical team analyze adding a general purpose lane from SR 520 to either I-5 or the Mercer Street exit. Maynard Arsove, No Expansion of 520, emphasized the importance of looking at environmental issues in the preliminary analysis. At a future meeting, information will be provided on environmental impacts and how each solution ranks against these.

Everything and Heaven, Too "B" – The following changes were made to this potential solution set: adding HOV lanes on SR 520; adding rail on I-90; making arterial connection across the north end of the lake; and possibility of an underwater tube or tunnel across the lake. Jeff stated that the technical team was studying the feasibility of a submerged tube for a third corridor. There are many questions associated with adding a third bridge across the lake, such as where would the bridge fit, how would it tie into the existing system, and how would it affect traffic? More information on this will be provided to the Study Committee at its next meeting.

Rail to Eastside – This potential solution set will be consolidated into the other potential solutions as all of the concepts are included elsewhere. During the technical team analysis, both SR 520 and I-90 will be examined as possibilities for rail.

Roadway/Bus – The following changes were made to this potential solution set: expanding the regional express bus system; making improvements on both SR 522 and SR 523; surveying feasibility of grade separation; looking for other possible north-south corridors on the eastside; and looking at passenger-only ferries. Nona Ganz, City of Kirkland, stated that the neighborhood and environmental impacts need to be examined early in the analysis process. Also, as Sound Transit begins to make decisions, they should be incorporated into the potential solution sets.

Maximize Alternatives – The following changes were made to this potential solution set: examining the effect of turning general purpose lanes into HOV lanes on SR 520; interest in looking at rail across the lake in conjunction with other concepts in the solution; and impact of keeping current HOV capacity on I-90.

BIG PICTURE ISSUES

I-5 Capacity Issues

Mike Horn, Parametrix, presented information on the current traffic volumes using I-5, not including the express lanes. The information shown highlighted bottlenecks in both the northbound and southbound directions on I-5. These problem spots include NE 45th, NE 175th, the Northgate area, and the downtown area. These areas have reached a level of service in which an anomaly (i.e., slow moving vehicles, debris in the roadway) can cause major backups. The importance of looking at how the potential solution sets may affect existing capacity on I-5 is critical. If an area already has a backup and more cars are added, the problem worsens.

The committee discussed the following:

- Relief of traffic on SR 520 will help traffic around the region.
- Slowdowns may be due to people slowing as they approach hills. How do these grades correspond to bottlenecks?
- Do the bottlenecks correspond to weave locations where a lane is added or dropped?
- The traffic capacity issue impacts the path people take to get to SR 520.
- Weekend traffic around NE 45th is just as bad as on weekdays.

County-Line Freeway

Jeff Peacock presented information from the technical team on the effects of adding a freeway along the King-Snohomish county line. A preliminary model has shown that a new route would carry 38,000 cars per day, drawing most of its traffic from SR 522 and newly generated trips; there would not be a significant impact on the amount of traffic on SR 520. Jeff noted that adding trips in the north region of the lake would also add to traffic on I-5 and other corridors. Jeff asked for preliminary feedback from committee members as to whether the technical team should continue to model and analyze this potential concept.

The committee discussed the following:

- Is it important to continue studying the county line freeway as it does not seem to aid in solving congestion problems in the Trans-Lake region?
- There are many studies showing that when capacity is added, trips are added to the system. The model needs to look long-term at how to meet transportation needs, but limit effects on land use.
- The county-line freeway should continue to be studied at this point so that information is considered when decisions are made on reasonable and feasible solutions.

Kirkland to Sand Point

The technical team is examining potential new corridors in the general area of Kirkland to Sand Point. A range of possibilities is being looked at, including a six-lane bridge, a six-lane tunnel, and an arterial

connection. The team has discovered that adding a six-lane bridge would mean that 1,000 to 1,500 buildings would be displaced. Adding an arterial connection would displace approximately 50 to 100 buildings. The team has not yet pursued further engineering work on this concept because of the large number of displacements. The Study Committee asked that the technical team compare displacement figures for the Kirkland to Sand Point corridor to that of proposed changes in other corridors. The technical team is pursuing the feasibility of adding a tunnel or tube across the lake and will provide that information at the next meeting.

Ridership Potential for Two Rail Lines Across the Lake

Jeff Peacock explained the factors influencing a decision to implement two rail lines across the lake. The most important aspects include cost and ridership potential. Rail carries approximately 5,000 people per hour. Comparatively, a van pool lane also carries up to 5,000 people per hour and so the change in technology is justified only with a higher number of riders. The cross-lake traffic is approximately 3,000-3,500 people per hour currently and the number is expected to grow to 5,000-9,000 in the near future. Jeff noted that based on these estimates, there does not appear to be enough ridership to support rail lines in two corridors.

The committee discussed the following:

- Two rail corridors is a long-term solution. Any potential solution must maintain flexibility for implementing two lines of rail in the future.
- How is rail placed on floating bridges?
- How do these numbers compare with the MTP transit plan?

SPECIFIC CORRIDOR ISSUES AND CONTEXT

SR 522 Project Information

Seyed Safavian, WSDOT, spoke to the Study Committee about the SR 522 improvement project which has been ongoing for the last 2.5 years. The goals of the project are to address public safety, reduce accidents, increase mobility and carrying capacity, and create a facility that runs through several jurisdictions. Over the 11-mile stretch, there are 26 intersections and the road carries 40,000 people per day. Future predictions call for an estimated 40,000 to 90,000 trips per day. The transit ride between I-5 and I-405 currently takes around 28 minutes, and an SOV user can expect the trip to take 36 to 40 minutes. The steering committee for the project has looked at the model, held public involvement forums, made presentations to area city councils, and is looking to make a final recommendation for improvements on SR 522. The project is targeting April for finalization of the report, and then will require funding to proceed with the project.

The committee discussed the following:

- Too much focus is being placed on transit travel, and not enough improvements targeting SOV congestion. Turn lanes and improvements at intersections are being made in order to improve congestion problems, which will benefit both transit and SOV users.
- How were grade-separated crossings examined?

- The project is looking at use of transit lane during peak times and reverting them back to parking in off-peak hours.

I-90 – The Center Lane Conversion Issues, and the Longer-Term Perspective

Bill Gunzler, Sound Transit, reported on current planning activities for the I-90 center lane. The project is examining improvements and changes to the transit and HOV lanes. In 1976, a Memorandum of Understanding (MOU) was signed. An EIS on proposed changes will be complete in 1999, and recommendations will go to the Washington State Transportation Commission for consideration.

Current plans call for making the center lane solely a transit lane and, which would switch directions according to the commute. A drawback to this plan is that when the center lanes are utilized for transit only, they displace SOV and HOV traffic to the outside lanes. I-90 is reaching capacity now with an average speed of 35-40 miles per hour eastbound and 20-25 miles per hour westbound during peak commute times. The additional number of buses has not helped transit reliability for riders, because the buses are frequently stuck in traffic on the outside lanes. In peak hours, 45 percent of the users of I-90 are car pools, van pools, and buses. Plans for a transit center at Mercer Island will have a rail platform so that rail may be added easily in the future. The impacts of the proposed changes have not yet been examined.

PROPOSED PUBLIC INVOLVEMENT ACTIVITIES

Margaret Norton-Arnold, Norton-Arnold & Janeway, briefed the Study Committee on proposed public involvement activities. Focus groups and public opinion polling are proposed to occur in the next few months. Waiting until the solution sets have been further fleshed out will make the materials presented at public workshops and focus groups more easily understood. She asked for feedback from Study Committee members on what they would like to see in workshops, ideas for a game to involve the public at workshops, and questions for the opinion polling.

The committee discussed the following:

- Ideas learned in the public workshops can be tested in the May public opinion poll.
- Connie Marshall suggested that the solution sets were like a puzzle and suggested using that concept to show that all the concepts fit together.
- Anne Knight asked that summarized solution sets come to the Study Committee for approval prior to being shown to the public.
- Public opinion polling should be coordinated with the questions asked in the origin and destination survey.
- Public involvement activities should focus on the problems the public faces with the Trans-Lake issues, transit use, and the issues surrounding transportation problems.

PUBLIC COMMENT

Al Rasmussen stated that it was important that the public have time at workshops and meetings to give opinions and comments. He did not want the focus of the workshop to be a game which might not allow for the exchange of ideas. He also asked that the web site be updated more rapidly.

AGENDA FOR NEXT MEETING

The next meeting for the Trans-Lake Washington Study Committee will be held on March 3, from 1:00 to 5:00 p.m., at the Best Western Bellevue Inn. Agenda items will include the model results of the MTP and no-action potential solution sets, information on evaluation criteria, an update on public involvement activities, and other technical information. Some Study Committee members requested that information be provided and a discussion held on whether or not additional roadways add to or decrease traffic congestion and capacity demand. Eugene Wasserman, Seattle Business, requested an update on the technical team's budget.

MEETING HANDOUTS

- Revised Agenda
- Multiple Trans-Lake Rail Crossings
- Origin-Destination Survey
- Public Involvement Work Plan
- Puget Sound Transportation Panel Survey
- Upcoming Meetings
- SR 522 Project Comment Form
- Discussion Summary from Land Use Discussion Group
- Solution Sets: Major Comments, Next Steps
- I-5 Traffic Profile Chart
- SR 522 Multi-Modal Project
- Correspondence from David Huber
- Correspondence from Maynard Arsove

MEETING ATTENDEES

Members

• Dick Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of SR 520
• Doug Baker	Washington Trucking Association
• Dan Becker	Points Communities
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Peggy Gerdes	North Lake Neighborhoods
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Jim Hill	Eastside Business

• Doug Jacobson	City of Lake Forest Park
• Rosemarie Ives	City of Redmond
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Rob McKenna	King County
• Phil Noble	Eastside Neighborhoods
• John Okamoto	WA DOT
• Peter Orser	City of Mercer Island
• Doug Pullen	Highway Users Association
• Janet Ray	AAA
• Phil Rourke	Points Communities Neighborhoods
• Scott Rutherford	University of Washington
• Donovan Tracy	Eastside Business
• Debbie Treen	City of Bothell
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business
• Mark Weed	Seattle Business

Alternates

• Susan Baker	Seattle Neighborhoods
• Maurice Cooper	Seattle Neighborhoods
• Peter Dewey	University of Washington
• Tye Ferrel	City of Seattle
• Kingsley Joneson	Seattle Neighborhoods
• Connie Niva	Washington Transportation Commission
• Henry Paulman	T.R.U.S.T.
• Dave Russell	Sound Transit
• Andrew Schmid	King County
• Noel Schoneman	City of Seattle
• Doug Schulze	Points Communities
• Larry Springer	City of Kirkland
• Ed Switaj	City of Seattle
• Dick Taylor	King County
• Mitch Wasserman	Point Communities Neighborhoods
• Fred Watson	No Expansion of SR 520

Seats Not Represented

• Jim Horn	Washington Legislature
• Ken Jacobsen	Washington Legislature
• Ed Murray	Washington Legislature
• Cheryl Pflug	Washington Legislature
• Rick Pusateri	Eastside Business

Public, Media

• Bill Barlow	Ava Bill Project Monitoring and Evaluation
• Lisa Clausen	Kirkland Chamber of Commerce
• Philip Gregg	Participant in University Neighborhood Plan
• Terry Marpert	City of Redmond
• Jan O'Conner	League of Women Voters - Seattle
• Dick Phillips	Viza Ridge
• Al Rasmussen	
• Betty Spieth	Kirkland Chamber of Commerce
• Rich White	Bellevue Chamber of Commerce
• Jeanette Williams	Sand Point Community Liaison Committee

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
BEST WESTERN BELLEVUE INN, 11211 MAIN STREET, BELLEVUE, WA
MARCH 3, 1999--1:00 TO 4:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed meeting participants to the tenth Trans-Lake Washington Study Committee meeting and reviewed the agenda. The Study Committee was to hear presentations by the technical team on the evaluation framework, examples of how solution sets will be evaluated; the decision process to reach agreement on reasonable and feasible solutions; overview of corridors and actions; update on public involvement activities, and description of potential solution sets for analysis and costing.

Lorie Parker, CH2M Hill, reported that four Study Committee members and several staff met in Bellevue to discuss TDM strategies, including land use. The group discussion revealed varied opinions regarding potential strategies. A proposed approach will be mailed out with the March 24 meeting packet.

PUBLIC COMMENT

Philip Grega stated that the Sukuma Viewpoint should be the specific passenger ferry docking location site. The site is in line with the 15th Avenue NE and the Pacific Avenue station (Sound Transit). The University Medical Center and Hospital are easily accessed by walking, as well. In addition, the Sukuma Viewpoint is close to 15th Avenue, with access by several roads. It is important to have bus access to the site and to integrate service with the University area services. A passenger ferry is a good idea.

Leonard Newstrom stated that if one the floating bridges is no longer driveable, the region will have to wait a long time for the second lake crossing to be restored. There needs to be a way to cross the lake. Mr. Newstrom suggested that committee members ask WSDOT specifically what is the probability that the bridge will last another 10 years. There needs to be a plan that will be workable. Mr. Newstrom mentioned that he and others have made previous suggestions to the committee and he would like a response to his comments, especially regarding his Madison Avenue ferry landing option.

Scott Blackman, Argosy Cruises, indicated that a passenger ferry solution is a very viable alternative whether or not it is Argosy which provides the service. He shared an example that after the San Francisco earthquake, in Alameda County, a passenger ferry service was established during repairs. The service was scheduled to stop when the repairs were complete, but they received enough public interest that the service continues today.

EVALUATING THE SOLUTION SETS

Jeff Peacock, Parametrix, described how the technical team proposes to compare and evaluate potential solution sets, and how that information will be provided to the committee. The technical team will make the information user-friendly and propose that it be displayed in a "consumer report" comparison array, not a ranking. The evaluation will be designed to compare relative performance among the solution sets, including effectiveness, impacts, and costs. Each solution set will include information on how the system is working, the environmental effects, how people are traveling, costs, and other major findings. The effects of the solutions on land use and demand management will be assessed in terms of land use planning compatibility, modal shift, trips reduced, and environmental effects. The travel performance will be measured at the system level and at the corridor level. Both reliability and safety will be evaluated in

each corridor, and summarized at the system level. Environmental impacts will be considered at the neighborhood/community level. The evaluation would include five measures for neighborhoods and three for the natural environment. Also, impacts on neighborhcods and the natural environment, both good and bad, will be considered.

The technical team has renamed some of the potential solution sets, as requested. The Puget Sound Regional Council (PSRC) has updated the Metropolitan Transportation Plan (MTP),with a major difference being the elimination of rail on I-405. This updated MTP will now be referred to as MTP '98. The revised names for solution sets are now referred to as: Roadway/Rail (Everything and Heaven A), New Crossings (Everything and Heaven B), and Maximize Alternatives (Maximize Alternative Choices). This will facilitate identifying what in each of the solution sets makes performance different and how each set compares to one another.

Information generated on environmental impacts is intended to provide people with information on what is happening in the communities/neighborhoods and its natural environment, in each corridor. This analysis will be done at the solution and system level, not at a level of detail that would be later generated by an environmental impact study. For example, levels of traffic on arterials and in the corridors will be an indicator of noise, but intersection-specific noise studies will not be done in this phase.

The following comments, questions, and issues were raised by Study Committee members:

- Over what period of time will the assessment of effectiveness be taking place? The assessment will begin with full implementation and until 2020.
- How required mitigation and enhancement will be integrated into the comparison table needs to be discussed.
- For analysis purposes, a peak period will be assumed to be three hours long.
- The analysis will rely on local comprehensive plans to determine future land uses and demands on transportation systems to guide forecasting of the effectiveness of potential solutions from now until 2020.
- Definitions of transportation terms, i.e., travel times, should be consistent with how WSDOT currently defines them for its mobility priority programming process.
- The MTP Modified solution set has rail on SR 520 instead of I-90, as identified in the current MTP.
- Freight use on SR 520 and I-90 will need to be better defined prior to further analysis.
- How the comparison will be made between system versus corridor-level improvements will need to be clarified. Some Study Committee members encouraged focusing on how the entire system functions.
- Consider including vehicle miles traveled to assist in determining how well the system is functioning.
- Integrate existing conditions and no action into the comparison of potential solution sets.

- Consider the number of people traveling, i.e., the percentages of persons traveling in rail, bus, single occupant vehicles, and HOV lanes.

- Include the volume-to-capacity relationship for transit alternatives. Consideration should be given to the fact that the volume-to-capacity relationship in transit may be less meaningful because the use of buses or rail is dependent on the frequency of runs rather than roadway capacity.

- Introduce change in travel time compared to no action in order to understand how the system is working today.

- Clarify what the 1-5 rating of the potential solutions sets will mean.

- Capacity-constrained areas, such as Mountlake, need to be considered. Once the potential solution sets are analyzed and there is a better understanding of how much traffic is going through the corridors, a better estimate can be made of how much traffic might go onto local interchanges.

- Constrained arterials should be considered in determining system compatibility.

- How will the trips made by walking and bikes be considered?

- If conditions east and west of the Lake differ, the comparison will be based on the worse case scenario.

- Land values that are affected by changing transportation patterns may be of concern to some Study Committee members.

- Air and water quality impacts will be included in the environmental review of the potential solution sets.

- Consider the economic development impacts of the potential solution sets.

- Consider what impact technology advances might have on how people travel.

- Corridor use will be studied incorporating the use and/or elimination of physical barriers in neighborhoods.

- Safety and reliability will be a considered when evaluating the potential solution sets.

- In 2020, all HOV lanes are assumed to require to require 3 persons in an individual car to qualify for usage.

- Costs will include capital and operating costs through 2020.

- Can operating and relative replacement costs of current transportation systems be identified? Could operating costs also include the cost of privately-owned cars.

- Because cost effectiveness can be measured many different ways, that information will be provided from various perspectives and the Study Committee will be allowed to draw its own conclusions.

STUDY COMMITTEE DECISION MAKING

Pat Serie reminded the Study Committee that at its last meeting, the group made a decision to go forward with an origin and destination survey based on a simply majority vote. While this was a procedural decision, not a decision on a set of reasonable and feasible solutions, it identified a need for the Study Committee to be more specific about the process for how it will make decisions in the future. Pat distributed a flow chart that summarized the process the Study Committee will undertake between now and June to make its decisions. The ground rules call for consensus, which does not necessarily mean that Study Committee members agree with every item, but can live with the overall decision. If consensus is not reached, then broad support should be demonstrated with an opportunity for minority perspectives. As a fallback, it might be necessary for the group to vote. Pat recommended that any future votes be a super majority of the group. She asked input on that approach. Early in the process, a suggestion was made to have a steering committee. That may be one avenue the group can use to help work with the technical team to bring specific proposals to the committee, or concentrated work sessions might serve the same purpose.

The following comments, questions, and issues were raised by Study Committee members:

- Will the evaluation measures be weighted? The technical team has proposed that it not weight the criteria, but rather allow each committee member to draw on their own conclusions using individual perspectives.

- It may be extremely difficult for the group to reach consensus, so the focus should be on how the group will vote on a set of reasonable and feasible alternatives.

- More time should be spent discussing how decisions will be made by the group.

- There seems to be distrust about who is doing the study. The Study Committee should work with the technical consultants during concentrated work sessions in order to best understand what the potential solution sets will mean for the region.

- A combination of a steering committee with round table discussions, allowing individuals to sit where they want, may be a useful way to work through the technical information being presented.

- How will solutions that appear to be working be moved forward?

- Small group discussion talking about one issue at one time is very frustrating. A workshop with more time for discussion on the wide range of issues being presented to the Study Committee might be more useful.

- There may be an advantage to the group discussing solutions as a whole so that there is a common level of understanding of both the technical issues and the concerns being raised by members.

- Drawing conclusions based on small group discussions is very unsatisfactory. The voices at the small group are not always represented accurately in the reports back to the larger group.

Pat asked that members contact her with their reactions to these suggestions which the group will be asked to agree to at the next meeting.

ZEROING IN ON CORRIDORS AND ACTIONS – FERRIES FROM SEATTLE TO KIRKLAND

Jeff Peacock provided information on the potential concept of passenger-only ferry or bus ferry service from Seattle to Kirkland. The areas of the University of Washington and Kirkland are anticipated to be the most successful markets. Successful markets need to competitive with bus travel time. Further work will look at how long ferry trips would take, including connections on either side. Any landing location must take into consideration: impact to critical areas; sufficient area available for terminal construction; navigable location; connections to roadway/transit network; opportunity for use of existing pier/dock; pedestrian accessibility; and sufficient area available for bus staging. Preliminary conclusions on potential landing areas include:

- Passenger-only ferry from downtown Kirkland to University of Washington Waterfront Activities Center in Maximize Alternative Choices solution set.

- Bus/Passenger Ferry from Kirkland in the vicinity of Houghton Beach Park to Sand Point in the vicinity of the NOAA Facility in Roadway/Bus solution set.

Next steps will include further engineering and environmental investigation of preliminary preferred terminals and routes, conceptual level cost estimates, review of privately provided service proposals, and continued review of prior studies.

The following comments, questions, and issues were raised by Study Committee members:

- The private interest that has been expressed for a ferry system has focused on a passenger ferry, not a bus ferry.

- What will be the impact of the speed of ferries?

- The current water taxi programs should be looked at as examples for what will and will not work.

- In order to compare travel times between ferries and another form of transit, the same hypothetical starting and ending points need to be evaluated.

- The market and transfer time assumptions for ferries will be based on existing bus ridership information.

- Why was a ferry from Kirkland to downtown Seattle not considered?

- An additional potential route for a ferry might be from Kenmore to South Lake Union.

- The West Seattle water taxi is successful because it is avoiding multiple segments of travel.

- If all that is being accomplished by adding ferries is removing travelers from buses and rail, it may not be an effective use of resources.

ZEROING IN ON CORRIDORS AND ACTIONS – TUNNELS AND TUBES – SAND POINT TO KIRKLAND

Jeff Peacock presented information on potentially building tunnels across Lake Washington. The types of tunnels and tubes that have been investigated include underground bored tunnels, immersed tunnels/sunken tubes, and floating tunnels/submerged floating tubes. In order to place a tunnel or tube across Lake Washington, seismic considerations, ventilation requirements, safety features, and construction facilities would all have to be evaluated.

Tunnels are generally not very vulnerable to seismic movements, but soil liquefaction would be of concern in a soft ground tunnel. Ventilation structures would have to be placed about every mile, except across the lake, and may require high stacks in residential areas. Safety is a major consideration in tunnel design. Extensive surveillance, control and driver information system, tow trucks, narrower shoulders, and passages for emergency escapes are all of concern. Construction of a tunnel would be difficult because there is no suitable site available within Lake Washington; element size is limited by the Ballard Locks; outfitting would be on an anchor site in the lake; transition to and from water is usually done in open cut; and sizable staging areas are required for such a project. It is also important to remember that floating tunnels are roughly double the cost of floating bridges, and mitigation costs at portals and ventilation facilities can be significant.

Preliminary conclusions of the options considered are that a submerged floating tunnel has more promise than other tunnel options. Of the corridors considered, the general SR 520 corridor appears most reasonable with environmental and technical issues focused between Foster Island and the west end of Portage Bay. The northern crossing would be significantly more expensive than the SR 520 corridor. A floating bridge may be better suited than tunnel options in the SR 520 corridor. These preliminary conclusions are based on a review of existing information; more study is needed to further flesh out this alternative.

The following comments, questions, and issues were raised by Study Committee members:

- Can just two HOV lanes be added to an underground tunnel?
- Other corridors than just the SR 520, I-90, and Kirkland to Sand Point should be looked at alternatives for placing a tunnel (farther north).
- Could limited applications of submerged or floating tubes be examined? For example, could pontoons on a floating bridge support a tube?
- Focus should be on going under land and over water rather than opposite.

PROPOSED PUBLIC INVOLVEMENT ACTIVITIES

Lorie Parker, CH2M Hill, reported on scheduled public involvement activities. On March 1, postcards were sent to a list of 206 companies, organizations, and tribal governments offering to provide information and presentations on the Trans-Lake Study. Follow-up calls will be made in the next two to three weeks. During the week of May 10, focus groups will be conducted. During the week of May 17, four public workshops are planned. During the week of May 24, a public opinion poll will occur. The

team will work on public survey questions in conjunction with the scope and timing of the origin and destination survey.

POTENTIAL SOLUTION SETS FOR ANALYSIS AND COSTING

Jeff Peacock reported on the continued processing of the proposed solutions sets, using information as it is developed to refine the solutions. The solutions proposed for evaluation do not include the proposed county-line freeway or a six-lane surface freeway from I-405 to I-5, through Kirkland and Sand Point. The technical team proposed that the county-line freeway not move forward into further analysis because it does not take a significant number of trips away from the SR 520 or I-90. Were it to move forward, additional stakeholders from that region would need to be part of any decision-making process and other east-west route alternatives would need to be considered. Due to the large number of displacements of buildings needed to build the surface freeway from I-405 to I-5 (approximately 1,500 based on preliminary analysis), Jeff recommended that no further assessment of a surface freeway in the Sand Point to Kirkland corridor be conducted, although a tunneled freeway and an arterial bridge connection will remain under consideration. The technical team also recommends dropping the "Rail to the Eastside" solution set entirely, because many of its elements are redundant with those in other solutions sets, and the unique elements have been included in the solution sets that remain. No objections were raised to these proposals, and the technical team will proceed with the remaining solution sets. Jeff asked the Study Committee for feedback on what level of detail on the potential solution sets they would like to receive, i.e., specific interchange connections.

The following comments, questions, and issues were raised by Study Committee members:

- What specific alignments and connections will be evaluated? Any alignments or connections are being designed simply for the purpose of modeling and evaluation; they should be considered as a starting point, not a decision.

- Sound Transit would like input to its second phase planning from the Study Committee.

- It was suggested that the information on the details of the concepts be provided to the Study Committee and time at a future meeting to ask questions. There does not need to be a full presentation of the information.

MEETING HANDOUTS

- Agenda
- TDM Strategies Meeting Summary
- Evaluating the Solution Sets: Draft Evaluation Framework
- Potential Solution Sets' Key Elements
- Draft Study Committee Decision Process
- Report on Passenger-Only Ferry/Bus Ferry
- Information on Tunnels and Tubes
- Media Alert (WSDOT) "Evergreen Point Floating Bridge Closed For Repair Due to High Winds"
- Fax from Donovan Tracy regarding Land Use
- Letter from Ed Switaj, City of Seattle, Department of Transportation
- Upcoming Meetings Schedule (updated February 23)

- Web Article "Solutions come in Threes" by Richard L. Morrill, Special to The Seattle Times

MEETING ATTENDEES

Members

• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of SR 520
• Dan Becker	Points Communities
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Rosemarie Ives	City of Redmond
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Rob McKenna	King County
• Phil Noble	Eastside Neighborhoods
• Peter Orser	City of Mercer Island
• Doug Pullen	Highway Users Association
• Rick Pusateri	Eastside Business
• Janet Ray	AAA
• Phil Rourke	Points Communities Neighborhoods
• Donovan Tracy	Eastside Business
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business
• Raleigh Watts	Seattle Neighborhoods

Alternates

• Susan Baker	Seattle Neighborhoods
• Alan Borning	Transportation Choices Coalition
• Maurice Cooper	Seattle Neighborhoods
• Tye Ferrel	City of Seattle
• Kingsley Joneson	Seattle Neighborhoods
• Jim MacIsaac	Eastside Transportation Committee
• Henry Paulman	T.R.U.S.T.

- Nic Rossouw — Seattle Neighborhoods
- Andrew Schmid — King County
- Noel Schoneman — City of Seattle
- Doug Schulze — Points Communities
- Larry Springer — City of Kirkland
- Ed Switaj — City of Seattle
- Dick Taylor — City of Lake Forest Park
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of SR 520

Seats Not Represented

- Mary Gates — Sound Transit
- Peggy Gerdes — North Lake Neighborhoods
- Jim Hill — Eastside Business
- Jim Horn — Washington Legislature
- Ken Jacobsen — Washington Legislature
- Ed Murray — Washington Legislature
- John Okamoto — WSDOT
- Cheryl Pflug — Washington Legislature
- Scott Rutherford — University of Washington
- Ron Sims — King County
- Debbie Treen — City of Bothell
- Mark Weed — Seattle Business
- Doug Baker — Washington Trucking Association

Public, Media

- Ken Barr — Self
- J. Bramar — Self
- Jim Cowles — Medina
- Philip Grega — Participant in University Neighborhood Plan
- Robert C. Hershberger — Self
- Fred McCorky — Hunts Point
- Tracy Krawczyk — Bellevue
- Johannes Kurz — Snohomish County DPW
- Ann Martin — King County
- Peyton Whitely — Seattle Times
- Betty Spieth — Kirkland Chamber of Commerce

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MUSEUM OF HISTORY AND INDUSTRY, SEATTLE, WA
MARCH 24, 1999 – 1:00 TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed the members of the Trans-Lake Washington Study Committee and other attendees to the meeting. She reviewed the agenda items and explained that the committee would hear information from the technical team on transportation demand management (TDM), enhancements and mitigation, the committee decision process, details of potential solution sets going to the modeling process, and the evaluation framework.

John Okamoto, Washington Department of Transportation, gave an announcement on the closure of the SR520 bridge on March 3, 1999. It was determined that damage occurred to the mechanical devices that open the bridge. Crews worked around the clock to fix the bridge for reopening. Since the incident, the requirement for opening of the bridge during high winds has decreased form 50 miles per hour (mph) to 40 mph. A forensic expert is examining the failed bridge parts to determine if there was error in manufacturing of the parts. Should nothing be found to be wrong, a technical consulting firm will look at the other potential causes so that a similar event can be avoided in the future.

Pat announced that Aaron Ostrom would be the new alternate for Virginia Gungby, 1000 Friends of Washington.

PUBLIC COMMENT

Henry Paulman, T.R.U.S.T, suggested that at a future meeting the Study Committee receive a presentation form the Kemper Development Company on its plan for reducing congestion by 25 percent.

Elizabeth Davis, League of Women Voters, offered the following principles to the Study Committee to consider in its deliberations: support diverse public transportation (e.g. passenger ferry, rail, HOV, bus, special needs, bicycle, and pedestrian); encourage public transportation; include employers in all policy development and ask them to adjust the current policies; ensure all options are environmentally sound; reduce air pollution, create policies that encourage a change in lifestyle; and support energy conservations methods. Ms. Davis urged the Committee to look at long range solutions and public transportation. She commented that the statement "If you build it they will come," is true in transportation solutions. Additional lanes may help in the short term, but eventually vehicles will clog the roadways, creating the same problems.

Gil Eade, Wetherill Nature Preserve, stated that the 17 acre preserve between Yarrow Point and Hunts Point is a delicate area that will be affected by decisions made in the Trans-Lake Washington Study. The preserve is very narrow, and he expressed concern about additional traffic around the preserve. He commended the group for looking at potential solution sets that include examining environmental impacts. Mr. Eade urged the group to move ahead with additional research in the area of environmental impacts. He asked the committee to commit to reducing negative environmental impacts and to help solve the degradation problems that already exist in areas like the preserve.

Leonard Newstrum provided the Study Committee with information regarding travel time in the region. He commented that people have to decide if they will change their mode based on travel time. If alternatives modes take longer, the average person will not use them. Small amounts of time are important

for everyone. There is a variable portion, the amount of time from individual homes to the lake, which is very important to consider. Many factors can vary travel time in this stretch. The committee should examine the travel times associated with each mode and alternative.

Phillip Grega expressed opposition to the proposed Port of Seattle bridge on Broad Street. The plan calls for single occupancy lanes across the bridge and is estimated to cost $5 million. The bridge will worsen traffic through the Belltown neighborhood and clog traffic on arterial streets. A count of trucks has not been conducted to understand the traffic requirements of the area. Mr. Grega also stressed that any origin/destination study conducted by the Study Committee should be reusable. The cost would be insignificant to ensure that the study is reusable. Mr. Grega asked the committee to consider the studies show 70 percent of the city uses transit and that this option is important in planning all transportation solutions.

Paul Demetriades, City of Medina, provided comments on proposed TDM strategies provided to the Study Committee. These strategies are aimed at reducing traffic demand and should not be included in the Trans-Lake Washington Study. The transportation pricing concept considered in all solution sets should be eliminated. The political acceptance for this strategy is low. In fact, the City of Medina has passed a law against tolls on the highways. TDM strategies can be encouraged, but more study is not needed by the committee in these issues.

Chris Leman, Eastlake Community Council, asked the Study Committee to fully consider what may be thought of as controversial alternative solutions. All alternatives must be fully examined. Mr. Leman stated that solution sets are considering the conversion of one lane in each direction on SR 520 to HOV. Congestion on SR 520 has been studied several times, and its has been determined that the problem in centered with weaving on the bridge. The sensible solution to this problem is to study converting the entire bridge to HOV during rush hour only. This would reduce the problem, but staff has indicated that they are not examining this alternative. Instead, they are study major construction projects in depth, which require extensive time and money. Mr. Leman urged the Study Committee not to ignore the cheapest and most effective method for reducing congestion. He asked that more examination be done on converting all lanes to HOV during rush hour. Variations could be included in the solution such as permits for heavy trucks.

TRANSPORTATION DEMAND MANAGEMENT (TDM)

John Perlic, Parametrix, briefed the Trans-Lake Washington Study Committee on proposed TDM strategies to be included in the potential solution sets. There is no current agreement for trip reductions involving penalties or incentives and a sub-regional agreement to adopt performance goals for reducing the trips or vehicle miles traveled has been suggested. John explained that TDM strategies can be thought of metaphorically as baking a cake. The basic cake body includes HOV facilities, transit, and pedestrian options. One of the activities that make use of the basic components of TDM is vanpooling. There are currently 1,000 active vanpools in the area, with more being created constantly. What can be thought of as "frosting on the cake" are the employer-based incentives for alternative transportation modes. TDM functions better with options such as bicycle racks and showers, transit pass subsidies, and any other policies making alternative modes of transportation more attractive to employees. The sprinkles on the cake are innovative TDM strategies like car sharing and instant carpooling. There have been a few demonstrations in the Portland area where these ideas are working.

Land use strategies cannot be ignored and are analogous to the kitchen – the oven, pans, and utensils need to make the cake. Land use strategies to be considered in the potential solution sets include transit-oriented options and creating communities were people work closer to home and do not need to commute. John presented a diagram from the LUTRAQ study showing a commercial residential area with a transit system center to reduce the need for personal vehicles on short trips. On a base level, a proposed

subregional agreement would state that each jurisdiction create the TDM strategies as long as the performance measures are met to reduce vehicle miles traveled or trips.

A pricing strategy is currently included in the Maximizing Alternative Choice solution set. It would include being implemented 10-30 years in the future when the congestion environment will be considerably different. Included in a proposed Maximizing Alternative solution set are providing funding for more vanpools, implementing rail or bus service at reduced cost, and financial disincentives to driving alone (e.g., congestion pricing, higher parking rate). Modeling work will be done by the technical team to examine the effects of an increase of $.50 an hour for parking on urban centers, and a toll of $1.00-$5.00 per trip to travel in the Trans-Lake corridors. A high-tech vehicle identification approach is being considered. The results of these approaches will be compared to the No Action solution set. Currently, a base-level reduction of vehicle miles traveled by 5 percent is estimated in the MTP. When pricing and other demand management options are added, a reduction of up to 20 percent in vehicle miles traveled may be obtained.

The following issues regarding TDM strategies were discussed:

- Although raising parking fees in Seattle may reduce the number of single occupant vehicle commute trips, it will have a negative effect on the downtown retail. Even a $0.25 increase in parking has a significant effect.

- What is the origin of the subregional agreement? John Perlic stated that a TDM Action Strategy published by the Puget Sound Regional Council in November 1998, mentions corridor-base agreements.

- The technical team should try to indicate which facilities are being impacted by the reduced congestion percentages and not focus as much on the actual percentages.

- The technical team should be clear how the percentages of change relate to each physical facility.

- Parking increases would need to occur in the entire study area. Current parking fees should be altered so that short-term parking decreases to encourage retail shopping in downtown and long-term increases to encourage commuters to use alternative modes.

- Past studies have shown that only 25 percent of traffic is related to commuting trips. Will the percentage reduction of vehicles be related to the overall group or just commuters?

- It is important to examine TDM strategies that reach the 75 percent of drivers not commuting to work and to create an infrastructure that provides alternatives to driving alone.

- A reconstructed SR 520 bridge would have, at a minimum, larger shoulders that could accommodate bicycles.

- The centers being considered for parking increases include downtown Kirkland, Bellevue, and other centers as indicated in Vision 2020.

ENHANCEMENTS AND MITIGATION

Jeff Peacock, Parametrix, presented the enhancement and mitigation concepts developed by the technical team. Most of the time, enhancements and mitigation are discussed in the context of an environmental impact statement. The issues usually arise once detailed studies quantify the impacts, which then drive mitigation. Additionally, these topics are not usually discussed on such a large scale as they will be in the Trans-Lake Washington Study. He commented that personal experience has shown the most effective enhancement/mitigation efforts are community based and are not imposed by outside engineers.

An important step in the process is for all expectations to be understood and to identify realistic solutions. The study area includes 60-70 miles of highway and 60-70 miles of rail options. Some of the potential solution sets will be dropped, so studying enhancements and mitigation on a detailed level at this point in the process would not be an effective use of resources. The drivers for mitigation are based on several factors, including noise studies, neighborhood traffic circulation study, and community aesthetics needs. Some of these studies, such as the neighborhood traffic circulation study, are far too expensive for this stage of a transportation study. The technical team will address the substance of impacts and opportunities, and then move to enhancements and mitigations. Potential mitigation options will be costed at a conceptual level.

The technical team plans to draft an impacts overview, which will serve as the tool to identify potential enhancements and mitigations. The technical team plans to devise a tool that will break the impacts into the EIS categories needed for evaluation. A chart will be created with a color-coded method for designating the value of each impact across a geographical map of the corridors. This tool will indicate areas needed for more study and attention. Mitigation has not been included in the results thus far, but the technical team will begin to provide this information to the Study Committee. Examples of enhancements and mitigation to the potential solution sets could include options like tunneling in appropriate areas, developing better interchange layouts, and elevating rail in areas which would be highly impacted. Depending on the outcome, committee members will get more specific in order to identify a set of reasonable and feasible alternatives. The technical team will seek community input and collect responses.

The following issues regarding enhancements and mitigation were discussed:

- What are the next plans for involving the community in the Trans-Lake Study? Jeff responded that work would be done in communities at a concept level during solution evaluation.
- Can a color scheme chart be completed for enhancements as well as mitigation?
- Identify impacts, which cannot be mitigated so the Study Committee and public are aware of all costs.
- How will the Study Committee evaluate the potential solution sets at a site-specific level?
- Jeff answered that the costs will be provided on a corridor level. Enhancement costs are difficult to predict, but a lump amount will be added to the cost estimate of the potential solution set.

PROPOSED DECISION PROCESS

Pat Serie, EnviroIssues, discussed a potential decision process with the Study Committee. The study is entering the refinement mode that will lead to recommendations in a final report. The group is in a

POTENTIAL SOLUTION DEFINITIONS

Jeff Peacock explained that the Study Committee members will be given the opportunity to meet with technical team members to discuss various options included in the potential solutions sets at today's meeting. The stations are divided by geographic area and attendees were encouraged to visit all the stations. Details form public input and earlier Study Committee work are beginning to appear in the potential solutions sets at places like interchanges. Jeff asked that the members write comments down so that the technical team could follow up on any suggestions for changes that are made.

Jeff clarified some misunderstandings that have been presented in the media recently about the county line freeway. The technical tam has recommended to not continue studying the county line freeway because it is not a solutions for the Trans-Lake Washington problem. However, the Study Committee has not officially decided to remove the option form the study and the issues needs to be revisited. One option would be to include the concept in the final recommendations as an issue requiring further study. The other topic which has been misunderstood is the surface freeway connecting I-5 to I-405 through Sand Point and Kirkland. The technical team determined that 1,200 to 1,500 buildings would be displaced by this facility. The corridor has not been ruled out, but will be modeled and studied as an underground tunnel to avoid these displacements.

Another concept that has been suggested is the conversion of all lanes on SR 520 lanes to HOV. The impacts of this option will be assessed by considering the impacts of converting a single lane in each direction on SR 520. The group should consider the impact of converting one lane on SR 520 to HOV before money is spent studying conversion of all lanes. Jeff stated that the technical team will continue on the plan to study the option of converting one lane on SR 520 to HOV. Pat asked if anyone was opposed to this discussion. Henry Paulman expressed opposition and was not satisfied with the conclusion.

The following issues regarding the potential solution definitions were discussed:

- Transit only and vanpool lanes on SR 520 should be analyzed. These different options are valuable when talking to the community. All options must be balanced, because SR 530 is the primary way of traveling from the east side to west side.

- Solutions for transit only on SR 520 to HOV lanes being considered due the Seattle City resolution?

- Henry Paulman requested that the Study Committee receive a cost estimate on a surface facility for Sand Point to Kirkland corridor. The technical team is planning to provide an estimate for a freeway in a tunnel, but not at the surface. Committee members agreed that a surface facility is not reasonable and should not be pursued further.

EVALUATING THE SOLUTION SETS

Jeff Peacock explained changes that had been made to the evaluation framework base on feedback from the last Study Committee meeting. Changes include a breakout neighborhood, air, and water quality impacts. The technical team has separated out some options in the potential solution sets to ensure neighborhood impacts understood. However, the team will not be providing a detailed circulation study. It was also recommended that choice availability and investment efficiency be added to the list.

learning process until the final decision is made. The group had originally decided to make a consensus decision. The technical team is proposing that a consensus decision be attempted in areas of disagreement noted. The Study Committee must be prepared to explain all disagreements in the recommendations to appointed and elected officials. While a consensus decisions will be strived for and will be the tool used to reach agreement, the ground rules agreed to by the Study Committee identify a fall-back method of voting. Pat suggested a 70 percent super majority if consensus cannot be reached. She asked if Study Committee members were prepared to agree to this decision process.

The following issues regarding the proposed decision process were discussed:

- A number of members were missing and more were needed in attendance before a decision could be made.
- It is rare that meetings are fully attended and it may be useful for members to phone in votes on procedural items.
- The committee discussed the percentage that the committee should use for a super majority including 60, 66, or 70 percent.
- A letter should be sent to members who do not regularly attend asking them to designate alternates so all seats are represented at Study Committee meetings.
- Attempting to reach consensus was important rather than building coalitions for a vote. A fall-back option should be a vote, but not the focal point of the decision structure.
- The decision process is meant to recombine and shape the potential solution sets to arrive at a set of reasonable and feasible alternatives.
- A suggestion was made t apply the simple majority rule to procedural decisions made by the group. And consensus to the final important recommendations.
- Concern was expressed that alternatives to consensus did not provide motivation for the committee to reach a consensus decision.
- How will comments from public meetings be incorporated into the decision structure and revision of the solutions sets?
- I would be useful to have simple voting method for deciding some of the routine decisions by the committee to save time. But, if the percentage in too low, the quality of the final product will decrease.

Following the above discussion, it was agreed that the facilitation team will distribute a request to all Study Committee members for input on what percentage would be required for a super majority vote and how many members should be presented before a decision could be made. They will ensure that all Study Committee members respond to this ballot. The facilitation team will then take that input and draft and distribute a revised proposed decision structure for action at the next meeting.

The following issues regarding the evaluation framework were discussed:

- Will congestion factors be included in the potential solution sets in order to look at long-term effects and the impact on land use form various facilities? Jeff responded that congestion will not be in the quantitative analysis because the capacity of the facilities is not changing. The only information available is comprehensive plans that show the Vision 2020 distribution.

- How people decide which mode of transportation to use should be examined as well as the efficiency of each mode. Jeff Peacock promised to follow up with Anne Knight on this issue.

- There were a variety of mechanisms that will be used to rate cost efficiency.

- Cost ranges form mitigation will be consolidated and provided later in the process

- A summary or costs would be helpful in the evaluation matrix

The technical team asked for agreement form the committee about the changes to the evaluation framework. The team will follow up with Anne Knight and Mitch Wasserman regarding their specific suggestions, but no other objections to the current ser of potential solutions sets were expressed.

NEXT AGENDA

The next Study Committee meeting is scheduled for Wednesday, May 5, 1999, at the Museum of History and Industry, Seattle, from 1-5 pm. In addition, the Study Committee will hold a discussion session on April 28 to discuss capacity and congestion-related issues.

PUBLIC COMMENT

Al Rassmussen stated that the Study Committee should improve the public involvement plan in order to reinforce the final recommendation they will produce. The current plan is not enough and is unclear. Mr. Rassmussen suggested that if public involvement is to be genuine, it should not be so structured. The public should have the opportunity to comment in its own words. Additionally, the meeting should be scheduled so that it can continue later at night if necessary. The committee will be able to get some good feedback if the follow these ideas.

Maurice Cooper, Seattle Neighborhoods, noted that all light rail options in the potential solution sets are shown on surface. Sound Transit is planning to use steel rails in designing these new transportations systems, which will create unacceptable levels of noise impacts. He encouraged more study be done on putting rubber tires on trains. There are numerous case studies which prove the benefit or rubber tires and show a dramatic difference in sound.

MEETING HANDOUTS

- Agenda
- Proposed Decision Structure
- Revised Criteria to Measure the Effectiveness, Impacts and Costs of the Solutions Sets
- Roadway/Bus: Key Elements
- Setting the Record Straight

- Letter from Tom Heller
- Letter from Virginia Gungby, 1000 Friends of Washington
- Letter from Daniel Becker, City of Medina
- Memo from Richard Conlin regarding the Seattle City Council Resolution 29574
- Public Workshop Update

MEETING ATTENDEES

Members

Jean Amick	Seattle Neighborhoods
Doug Baker	Washington Trucking Association
David Cortelyou	Seattle Business
Paul Cowles	North Lake Business
Margaret Doman	Eastside Neighborhoods
Bob Edwards	Puget Sound Regional Council
Maggi Fimia	King County
Nona Ganz	City of Kirkland
Bob Gillespie	Eastside Business
Daryl Grigsby	City of Seattle
Tom Heller	Seattle Neighborhoods
Jim Hill	Eastside Business
Rosemarie Ives	City of Redmond
Doug Jacobson	City of Lake Forest Park
Anne Knight	Transportation Choices Coalition
Jean Leed	Seattle Neighborhoods
Connie Marshall	City of Bellevue
Phil Noble	Eastside Neighborhoods
John Okamoto	Washington Department of Transportation
Peter Orser	City of Mercer Island
Rick Pusateri	Eastside Business
Janet Ray	AAA
Phil Rourke	Points Communities Neighborhoods
Scott Rutherford	University of Washington
Raleigh Watts	Seattle Neighborhoods
Mark Weed	Seattle Business

Alternates

Susan Baker	Seattle Neighborhoods
Alan Borning	ALT-TRANS
Dan Bray	T.RU.S.T.
Richard Conrad	City of Mercer Island
Maurice Cooper	Seattle Neighborhoods
Peter Dewey	University of Washington
Tye Ferrel	City of Seattle
Roy Francis	King County
Kingsley Joneson	Seattle Neighborhoods

• Chris Leman	Seattle Neighborhoods
• Aaron Ostrom	1000 Friends of Washington
• Henry Paulman	T.RU.S.T.
• Dave Russell	Puget Sound Regional Council
• Noel Schoneman	City of Seattle
• Doug Schulze	Point Communities
• Larry Springer	City of Kirkland
• Ed Switaj	City of Seattle
• Dick Taylor	King County
• Mitch Wasserman	Point Communities Neighborhoods
• Fred Watson	No Expansion of SR 520

Seats Not Represented

• Aubrey Davis	Washington Transportation Commission
• Peggy Gerdes	North Lake Neighborhoods
• Jim Hor	Washington Legislature
• Ken Jacobsen	Washington Legislature
• Rob McKenna	King County
• Ed Murray	Washington Legislature
• Cheryl Pflug	Washington Legislature
• Doug Pullen	Highway Users Association
• Cynthia Sullivan	King County
• Donovan Tracy	Eastside Business
• Debbie Treen	City of Bothell
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business

Public, Media, Staff

• Glenn Anderson	Representing Cheryl Plfug
• Carolyn Carson	Laurelhurst
• Elizabeth Davis	League of Women Voters
• Paul Demetriades	City of Medina
• Gil Eade	Wetherill Nature Preserve
• Philip Grega	Belletown Neighborhood Planning Participant
• Tracy Krawczyk	Bellevue
• Johannes Kurz	Snohomish County
• Ann Martin	King County
• Pat Mattison	League of Women Voters
• Len Newstrum	
• Dick Phillips	URLL
• Mary Pneuman	League of Women Voters
• James P. Roberts	Self
• Tu-Uyen Tran	Madison Park Times
• Andrea Tull	Sound Transit

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
BELLEVUE REGIONAL LIBRARY, BELLEVUE, WA
APRIL 28, 1999--3:00 TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed members of the Trans-Lake Washington Study Committee and other attendees to the meeting. The topic to be discussed was the relationship between additional capacity and congestion in the Trans-Lake Study area. She explained that the format of the meeting would be an informal discussion. Pat reminded the Study Committee that no action or agreement would be reached in the meeting, but rather it was an opportunity to share information.

Pat asked the committee to consider the following questions in their comments. 1) What are the pros and cons of adding capacity in the Trans-Lake Study area? 2) Why should capacity be added? 3) How should the issues be considered when evaluating Trans-Lake solutions? She stated that there is no correct answer to the problem and that all input would be valuable to the group's final recommendations.

OVERVIEW OF ARTICLES

Bernard van de Kamp, WSDOT, provided a summary of the articles mailed to Study Committee members. The following is a list of themes discussed in the articles:

- People make rational travel choices based on cost, time, and convenience.
- "Total demand" appears to be a moving target—it varies with the availability of services and facilities.
- Problems (and demands) are complex—few attempt to "solve" congestion—most seek mobility.
- Tools suggested in the background materials:
  - Auto-only and truck-only roadways (financed by users)
  - Non-motorized (sidewalks, bike lanes, etc.)
  - Public/rapid transit and supporting infrastructure (HOV, rail)
  - Transportation demand management (carpool, telework, etc.)
  - System management (ramp metering, traveler information)
  - Land use (density, transit oriented, etc.)

STUDY COMMITTEE DISCUSSION

Paul Cowles, Northlake Business, advocated the need for additional capacity. By not building more roads, the region is not planning for the future. Because economics change, plans should be made so that the region has the right-of-way to work with problems. The economic opportunity and the choice to expand capacity in the corridor are available. Any solution should include several modes including single occupancy vehicle (SOV) lanes and transit.

Maynard Arsove, No Expansion of 520, stressed the need to examine environmental impacts. These issues cannot be ignored. A good model of the environmental impacts is needed in the high density areas of the Trans-Lake Study area.

Maurice Cooper, Seattle Neighborhoods, commented that expanding capacity in the open areas is a disaster. He cited case studies from Paris where a main road is poorly designed. Even though the road is wide, capacity is low due to poor interchange access. The design of SR520 needs to be changed because a standard freeway would help support the region's capacity. In London, a highway was expanded, and instantly the lanes were full and congestion identical to before the expansion. The design of the road is the most important factor.

David Cortelyou, Seattle Business, stated that Seattle is considered to have a progressive lifestyle, not only throughout the country, but also internationally. The city will experience growth and needs to plan for these changes. The environmental issues of the region have put constraints on the growth. Capacity must be increased through a combination of modes including transit, transportation demand management strategies (TDM), and additional SOV lanes. The Study Committee should work to find a combination that is a middle ground.

Jim Horn, Washington Legislature, argued that the region can build its way out of congestion. He cited I-90 as a highway that has accomplished this goal. It was a dangerous and congested roadway before improvements and is now one of the safest highways in the state. He stated that any recommendation should allow for more lanes to provide flexibility in the future. He asked if the group has a vision for the future of the area. The problem is to define the best method for moving the population with the transportation demands that exist. Environmental impacts are also important to consider. In addition, the quality of life has not been discussed in depth. The automobile is an important part of everyone's quality of life. It is a piece of the American spirit and as the ability for vehicles to move faster increases, so does the quality of life. He reminded the committee to be visionary in evaluating the solution sets and to keep the quality of life in the region as a priority.

Roy Francis, King County, stated his belief that the final solution will be a combination of all options discussed in the study. Added capacity is needed to meet the goals of increasing densities. Land use strategies should also be considered that allow people to move without using vehicles to travel. The Study Committee should concentrate on deciding which elements to emphasize and which methods will be the most efficient. People are accomplishing tasks differently today, for example purchasing items over the Internet. One of the most important factors to consider is the cost and ability of building additional capacity. When the Endangered Species Act (ESA) is figured into the cost of building new lanes, it may be too expensive. Additional capacity should not be the focus of the approach to evaluating the solution sets.

Anne Knight, Transportation Choices Coalition, stated that her recent trip to Kansas City provided a picture of the result of sprawling roadways and additional capacity. The inner city has died in the process of allowing the community to sprawl. Seattle has contained some of the desire to spread and now has the opportunity to plan for the long-term future of the region. The decisions made today will shape the future of the area. The solution can find a way for suburban areas to make development work. The Study Committee should examine how people move and look at options like transit and rail that do not necessarily add road capacity.

Daryl Grigsby, City of Seattle, stated that if additional capacity is added it will become congested. He commented that it is ironic that this problem never occurs in bicycle lanes. This unused capacity is a choice. Even if SR520 switches to transit only, cars will continue to be purchased. At some point the region needs to decide to use alternative forms of transportation. This is a problem that the committee

should address. He continued that congestion is fact of urban life and will not be ended or even reduced by the outcome of the study. Growth in the region is important to our economic well-being.

Doug Pullen, Highway Users Association, commented that the economic status of the region helps define the transportation choices people make. The transportation problems in the area have a great deal to do with the affluence of the region. Social engineering will not be an effective solution and other factors must be examined. Pricing is an important issue that has not been addressed yet. He stated that he would like to see the presentation being made by Kemper Freeman which proposes a solution to the congestion facing the region.

Aubrey Davis, Washington Transportation Commission, stated that transit makes it possible for the major corridors to function. As the area grows, it will be forced to depend on transit more and more. More than $1.2 billion is spent on transportation per year in the state. This will be increased to $1.6 billion in the near future. The Kemper plan assumes the transportation plan for the region has been accomplished, and $2.7 billion per year would be needed to meet his goals. The solution must be a mixture of factors. Our society lives the way we do because of the automobile. And adding capacity may solve the problem temporarily. But, the problem will not be solved until there is a price associated with travel. Pricing must be phased in as part of the solution.

Jim MacIssac, Eastside Transportation Committee, stated that building additional capacity will result in a rescrambling of traffic patterns. This is an unmet need and must be addressed. A mixture of solutions is needed in the final recommendations.

Peggy Gerdes, North Lake Neighborhoods, stressed the importance of the design improvements on SR522. The hope is that transit will be able to move through the corridor more quickly. She suggested examining the possibility of a double-decked road across the lake. In Norway, the freeways over the fjords are narrow. These principles could be applied to the Trans-Lake Study. Another question that must be defined is exactly how transit/HOV lanes will be used.

Dick Adams, T.R.U.S.T., expressed concern that focus should be on moving people around the entire region. There is a need for people to travel throughout the Puget Sound area which must be met by additional capacity. Focusing on SR520 is not an adequate solution.

Donovan Tracy, Eastside Business, stated that as the density in the area rises, the extent of urban life expands. The region is becoming one urban area and the increased density makes traffic worse. The Study Committee should focus on choice and balance as guiding principles. Seattle is a city without a history of transit use and high density. These problems are being forced to the surface with rapid growth.

Maynard Arsove commented that in recent years housing costs have risen. Young people cannot afford houses in the real urban area, and so apartments are going up to accommodate them. The city and high density demands public transportation that functions effectively to carry people to jobs downtown.

Maggi Fimia, King County, commented that data and analysis should be carefully monitored before decisions are made. The major issue is balance. There is resistance to growth in the area and the impact of cars has not been balanced. Pricing strategies should be examined. People will choose the mode which is the most convenient for them. Maggi commented that car pool lanes are being used. There are over 700 van pools in the region, and HOV lanes carry twice as many people as the SOV lanes. There is an opportunity cost of increasing capacity on other parts of the transportation system, like sidewalks. There needs to be a method for distributing transportation money to all parts of the system. Providing choices is a critical part of boosting the quality of life.

Pat Serie asked Jeff Peacock to provide information on how the evaluation of the solution sets will address capacity and congestion. Jeff Peacock, Parametrix, stated that the technical team is keeping a balanced approach to evaluating the solution sets. Demand is not a fixed number and varies based on many factors. The demand figures will be different in some of the solution sets. The technical team will attempt to show the impact of changes to the system and how they affect roadways outside of the study area as well. The ultimate question to answer is the long-term design of the region.

Donovan Tracy stated that there should be elements in the solution sets that reduce demand. A baseline of demand based on population forecasts, should be used to facilitate comparisons of solution sets. The technical team should show how each element effects the solution set. He stated that variable demand is a problem in terms of evaluation. Jeff Peacock responded that demand is variable because there are many constraints. As these change, demand changes. The evaluation will show a no action scenario as a comparison.

King Cushman, Puget Sound Regional Council, commented that there is no magic number for demand. The committee is looking at one corridor. However, all corridors affect each other. By 2020 there will be 14 million daily trips in the region. Depending on the solution set, different portions of these total daily trips will cross Lake Washington. The overall picture is important to remember--how and where these people go has a big impact on the transportation situation.

Jim Horn stated that the basis of analysis should examine movements from the eastside to the westside. He also asked for information on an unconstrained situation.

Tom Heller, Seattle Neighborhoods, said that there is no fixed trip table. Any improvements on certain corridors bring trips from elsewhere. These should be identified to aid in evaluation.

Rob Fellows, WSDOT, stated that many people in the region plan their lives so that they do not have to cross the lake. The model defines the origins and destinations paired with certain corridors. People will adjust their lives as improvements are made in the corridors.

Maggi Fimia noted that increased mobility must be consistent with land use.

Cheryl Pflug, Washington Legislature, stated that mobility must be increased. Charging for trips would be difficult because some of the trips taken are not optional.

Donovan Tracy stated that in order to protect the integrity of the process, the solution sets must be feasible and account for all trips. There could be elements that reduce the number of trips taken in the region.

MEETING ATTENDEES

Members

• Dick Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of SR 520
• Dan Becker	Points Communities
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Trans. Commission
• Margaret Doman	Eastside Neighborhoods

• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Peggy Gerdes	North Lake Neighborhoods
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Tom Heller	Seattle Neighborhoods
• Jim Hill	Eastside Business
• Jim Horn	Washington Legislature
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Peter Orser	City of Mercer Island
• Cheryl Pflug	Washington Legislature
• Doug Pullen	Highway Users Association
• Rick Pusateri	Eastside Business
• Donovan Tracy	Eastside Business

Alternates

• Alan Borning	Transportation Choices Coalition
• Maurice Cooper	Seattle Neighborhoods
• Roy Francis	King County
• Jim MacIssac	Eastside Transportation Committee
• Connie Niva	Washington Trans. Commission
• Henry Paulman	T.R.U.S.T.
• Noel Schoneman	City of Seattle
• Andrew Schmid	King County
• Ed Switaj	City of Seattle
• Mitch Wasserman	Point Communities Neighborhoods
• Fred Watson	No Expansion of SR 520

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MUSEUM OF HISTORY AND INDUSTRY, SEATTLE, WA
MAY 5, 1999--1:00 TO 5:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed Study Committee members to the Trans-Lake Washington Study Committee meeting. She reviewed the agenda and reminded the committee that the major discussion topic for the afternoon would be environmental impacts and mitigation. The mailing included detailed maps of environmental impacts in the study area, which would be the basis for beginning discussions. Other important topics to be covered include the decision process and an update on the status of public involvement.

PUBLIC COMMENT

Elizabeth Newstrum, Citizen of Yarrow Point, urged the Study Committee to consider alternatives. She believes that another access point to I-5 is necessary. SR 520 currently has four lanes, and plans must be made to account for these lanes while the bridge is closed for construction. Ms. Newstrum commented that the bridge is in the wrong place, and may not be the best location for construction of new lanes. There are several existing corridors including eastbound SR 522, SR 202, SR 908, SR 523, SR 513, and westbound SR 522, which could be developed to better serve the surrounding communities. Another consideration for the area should be the sensitive fish and wildlife habitat around Lake Washington. Rail, bus, and mass transit may not necessarily be the best way to solve the Trans-Lake problems.

Bill Moritz, Cascade Bicycle Club, stated that the historical wrong on SR 520 must be changed. When the corridor was designed, allotments for bicycles and pedestrians were omitted. In 1991, an organization called "Bike 520," collected 14,000 signatures on a petition. Thirty-seven percent of these people stated that they would use the bicycle lanes for commuting if the option were available. Mr. Morris urged the committee to consider bicycles and pedestrians in its final recommendation. The large number of people traveling from the University of Washington and the Eastside areas would be benefited by this transportation option.

Barbara Roberts supported the consideration of bus ferries. She commented that passenger ferries create expenses from bus turn arounds, waiting rooms, and parking lots. A recent article in the Seattle Post-Intelligencer stated that it would cost $360 million to fix these features in the state currently. By using buses, these extra expenses would be eliminated. Ms. Roberts added that it is more efficient and ecologically friendly to construct bus-only ferries. She also supports consideration of bicycles on SR 520.

Brian Ramey, University District resident, stated that 60,000 people commute into the University District to work. He urged the committee to examine options for integrating a bus lay-over station, the planned rail station, and any other transportation options to help relieve excess vehicle traffic on 45th Street. Mr. Ramey expressed interest in the rail option and bypass tunnel to I-5 because it would help relieve the gridlock on 45th Street. The tunnel under 45th Street would also help east-west traffic. Additionally, it would help in reducing crimes, and add easier connections to all stations. He asked the committee to consider these options in working to solve the serious traffic problems facing the University District.

Henry Paulman, T.R.U.S.T., expressed appreciation for the origin/destination study being conducted on SR 520. He requested that the questionnaires for the origin/destination study be given to interested Study

Committee members for review prior to mailing them to the public. Mr. Paulman also asked for the geographic dispersal of the names before questionnaires are mailed.

Maynard Arsove, No Expansion of 520, stated that the SR 520 corridor is not only the worst traffic problem across Lake Washington, but it is also in a poor location. He recently attended a meeting discussing seismological activities in the Puget Sound region. The presentation described the Seattle fault which runs along the SR 520 corridor. There was an earthquake of 4.9 magnitude in June 1997, along the same fault line on Bainbridge Island. The fault has the potential to produce spectacular earthquakes in the area at any time. The Study Committee should examine whether building a new bridge in the same corridor would be a wise decision.

Chris Leman, Seattle Neighborhoods, agreed with the City of Seattle's statement not to assume building a new bridge is the only solution. He commented that the committee should examine the best place to build a bridge, and stressed the need to study alternatives in the process. One discarded option is to remove SR 520. If the area is dangerous due to seismic concerns, the option should be examined. Mr. Leman cautioned the committee that lanes planned and built as HOV lanes do not always remain HOV lanes. There is no way to ensure that the lanes will not become SOV lanes in the future. He expressed outrage at the difficulty in getting the study to include a peak-period-only HOV configuration for the SR 520 bridge.

Bob Gillespie, Eastside Business, commented that the committee should be concerned about media coverage of the origin/destination study. He stated that the media has caused public alarm about the study, and he urged committee members to contact the media and request that committee members be consulted before information is broadcast about the study. It is important not to scare people from returning the origin/destination survey.

PRELIMINARY EVALUATION RESULTS

Jeff Peacock, Parametrix, reviewed the approach for identifying enhancements and mitigation. Cost is being addressed at a conceptual level and will become more defined in the next meeting. There is a question of whether or not the specific mitigation details are needed to go onto a environmental impact statement (EIS). Some specifics may be needed, and the Study Committee will need to make this decision. Jeff urged the committee not to draw too many conclusions from the environmental impact maps before understanding the effect of mitigation.

Jeff stressed that it is important for the Study Committee to concentrate on impacts in the neighborhoods. The environmental impacts to some neighborhoods, Endangered Species Act (ESA) issues, and other fisheries issues create difficulty in designing a new corridor across the lake. The technical team is still examining the impacts at an aerial photo level and have not looked at the detailed intricacies of the impacts. The noise impacts data is based on a collection of complaints in the corridor over several years. Mitigation efforts will concentrate on options to not only reduce the noise impacts, but also avoid displacements, create new crossings, and reduce congestion around the study area.

Aubrey Davis, Washington Transportation Commission, discussed the development of mitigation options on I-90. He stated that public involvement in the City of Mercer Island was the key to creating a publicly acceptable corridor. The design, created through a joint planning process, proved to be very successful. This success came from compromising and taking all community viewpoints into consideration. Crucial items included in planning were: sound walls, aesthetically pleasing designs, and a trail across the bridge to accommodate pedestrians and bicycles. When the design was completed, the cost was extremely high. However, the community and planners backed the design and it was accepted for construction. One of the major lessons learned through the I-90 corridor project was that the process itself is the key to gaining the support needed to pass such a decision.

Daryl Grigsby, City of Seattle, discussed the recent Sound Transit proposal for rail in South Seattle. Planners concluded that Martin Luther King Way was the best location for the rail line. A group called Save our Valley expressed concern about the unequal impacts from rail in the area. North Seattle, a more affluent part of town, is to have a tunnel while South Seattle will be divided by the rail line extending through town. The City of Seattle worked with the community to extend the right-of-way from 96 feet to 104 feet in places to avoid displacements and property takes. Additional mitigation efforts included decorative paving, improved amenities around the station, and additional crossings to provide safety to pedestrians and other vehicles. The City of Seattle is working hard to make the project a part of the community.

Dan Becker, City of Medina, stated that the community is attempting to be proactive in ideas. While Mercer Island dealt with I-90, the Points Communities have been dealing with SR 520. Citizens are concerned about the runoff going directly into the water without treatment. A city resolution has been passed in Medina and Clyde Hill, and Hunts Point and Yarrow Point are currently passing them. Anything that will be designed through the Points Communities needs to measurably reduce traffic and congestion. Additionally, the Points Communities would like to see improved air and water quality, and reduced noise impacts.

Phil Rourke, Point Communities Neighborhoods, commented that the Clyde Hill community is committed to improving transportation in the SR 520 corridor. Citizens realize that they will be living with construction impacts for some time. The mitigation efforts provide an opportunity for the community to help create a new facility to improve the community. Additional connections are needed as a component of improvement, and noise reduction measures must be taken. The Point Communities Neighborhoods understand that the "not-in-my-backyard" principle will only work to negatively impact the transportation decisions in the area.

The committee discussed the following:

- Is it possible to put bike lanes on SR 520? Rob Fellows, WSDOT, stated that studies show it is nearly impossible to add bike lanes to the current corridor. It is difficult for bicycles to maneuver through the drawbridge portion, and the bridge can not take any more floatation capacity.

- The playfield by SR 520 should be added to the sensitive areas list.

- The best ideas for mitigation and enhancements will come from the communities discussing the issues and reaching agreement.

- The mitigation discussion by the Study Committee will be the basis for looking at cost estimates. The information in coming months will address effectiveness, performance, and cost of the various mitigation ideas.

Round Tables

The Study Committee divided into small round tables where different sections of the study area were addressed. They discussed the potential issues that would require mitigation in the surrounding neighborhoods. The technical team will examine the effectiveness, performance, and cost of potential mitigation concepts and include them in the hybrid solution sets. The following is a list of the concepts and ideas from the round table discussions.

SR 520 East of Bridge

- Move SR 520 south to avoid the end of Cozy Cove and lower the roadway at least 100 feet to reduce the height of the ventilation system out of sight lines.
- Treat wastewater runoff.
- Add noise walls with landscaping.
- Create lids that will be parks with ballfields and nicely designed transit centers.
- Devise an effective strategy to deal with the cut-thru traffic (HOV, transit).
- Would wooden noise walls have a better sound absorption?
- Place the high-rise of the bridge in the middle and remove the east and west high-rises.
- What are the existing mitigation plans for SR 520 for Redmond?
- Include bicycle and pedestrian access to the new 40th Street transit center.
- Add fir trees in the middle of the SR 520/Bellevue Way cloverleaves.
- Examine options for a double deck roadway.
- Examine lowering the entire corridor to mitigate noise impacts.
- Add fir trees at Yarrow Bay.

SR 520 West of Bridge

- HOV tunnel access to I-5 to mitigate sound (Plexiglas sides, aesthetics) and reduce displacements.
- Put a cover on I-5, and on I-5/SR 520 intersection. Examine the effects on the water table, and the view blockage for residents.
- Restore pedestrian connection between Eastlake, Roanoke, and Capitol Hill.
- Add rubber tires on the Sound Transit rail proposal.
- Examine providing an alternate SR513 connection or bypass to I-5.
- Consider removing SR 520.
- Create bicycle connections from the Arboretum, SR 520, and the University of Washington.
- Do not expand the footprint. Remove the Arboretum ramps.
- Reconnect Foster Island and the Arboretum.
- Create pedestrian connections from Madison Park to Montlake and the University of Washington.
- Consider a tiered structure.
- Collect all stormwater run-off and channel it into the sewers.
- Move the high-rise into the middle of the lake.
- Straighten SR 520.
- Consider a submerged tube to replace the high-rise for boat passage.

Sand Point to Kirkland

- The freeway from I-5 must tunnel to the lake before going over the bridge, and then tunnel to I-405 to avoid displacements.
- Due to the shoreline and important fish habitat, the bridge would need high rises at the ends. Therefore, the entrance to the tunnel would be further inland than the maps show and would therefore increase displacements.

- Concern was expressed about how connecting corridors would effect Sand Point Drive and Juanita Drive. They are already congested roadways, and the topography of the area makes widening difficult.
- One person felt that the road should continue in a tunnel and exit on 124th or go all the way to I-405. The same idea was expressed at Juanita Drive--tunnel all the way to I-5.
- Mitigate traffic to Kenmore and I-405.
- Avoid displacements.

SR 522

- Limit left turn lanes.
- Add pedestrian walkways. Separate pedestrian and bicycle pathways. "Soften" the edges, add more "green" and annuals for color.
- Increase lighting for pedestrians and apartment residents to get onto SR 522.
- Improve the Burke Gillman trail to have better access. Create a north-south bicycle connection.
- Limit access to the SR 522 corridor.
- Increase the grade separation.
- Separate a frontage road from SR 522.
- Combine driveways.
- Improve the drainage detention system.
- Mitigate noise and traffic in the area. Put sound barriers close to residential areas.
- SR 522 bisects Kenmore. Improve the street connections with bridges over SR 522 and add lids.

Rail through Eastside

- Refer to light rail as "High Capacity Transit."
- Mitigation for businesses affected by at-grade routes. Create special economic zones.
- At-grade operations/impacts would be difficult for the community to accept. Grade-separated light rail is preferred in the community.
- Find alternative technologies for noise reduction (Maglev/Monorail/rubber tires).
- Noise impacts are a major concern.
- Details of light rail at the western high-rise are needed.
- Create well-integrated modal connections for bicycles, bus, and pedestrians.
- Create incentives for economic and transit-oriented development.
- There will be a loss of car, bus, and HOV capacity on highways and roadways (especially I-90). Consider options for trucks. Mitigation measures such as total demand management (TDM), tolls, lane conversion, and truck-only lanes.
- Elevated light rail routes above roadway.
- Maintain crossings for vehicles and people.
- Start with a discussion of planning to avoid using mitigation.

Other Issues

- The discussion of mitigation ideas will feed into the design. The committee should strive to find a solution that avoids mitigation.

DECISION PROCESS

Pat Serie, EnviroIssues, asked the Study Committee to discuss an reach closure on the decision-making process. The proposed goal of the committee is to strive for consensus, and fully characterize alternative viewpoints. A vote will be taken only if the group can not reach consensus. The Study Committee agreed to use 60 percent of the members or alternates present to make procedural decisions where a vote was needed. Procedural decisions would include solutions to be further analyzed by the technical team or information to be included in the final report. After much discussion, the group agreed to use the same percentage for the final recommendation.

The committee discussed the following issues:

- The Study Committee will not be asked to make a decision on an item at the same meeting information about the topic is presented for the first time.
- The final recommendation from the Study Committee should have the support of a majority of members.
- The committee expressed support for reaching a final recommendation as quickly as possible and not meeting into August.
- Members have the responsibility to attend all meetings or to send an alternate.
- Solution sets could be ranked by the degree of consensus.

PUBLIC INVOLVEMENT

Lorie Parker, CH2M Hill, informed the committee that ongoing public involvement activities include the monthly distribution of "Crossings, community group meetings, focus groups, and four upcoming community workshops. Bruce Brown, Pacific Rim Resources, presented information on surveys for the origin/destination survey currently underway. The results of the survey should be available by June 9th. For the community survey, the study area has been divided into four quadrants for statistical analysis of responses. The survey will allow for anonymous responses from the public, and will be sent to 400 people in each of the study area quadrants. The questions are proposed to address the current alternatives available to residents and will provide important opinion information on improving traffic in the region.

The committee discussed the following:

- There are regions of the study area that do not have as many alternatives as others. Therefore, the survey responses could be biased.
- The survey should ask if people would prefer to stay in SOV lanes.
- Bus ridership opinions must be included in the responses.
- Locations of workshops and meetings should be distributed around the region.
- Several Study Committee members asked to review the community survey before it is sent out.

NEXT MEETING

The next Study Committee meeting is scheduled for Friday, May 21, 1999, at the Best Western Executive Inn, 200 Taylor Avenue North, Seattle, from 10 am-4pm.

MEETING HANDOUTS

- Agenda
- April 28 Meeting Summary
- Solution Sets by Corridor
- Sample Mitigation Tools
- Environmental Effects of Light Rail
- Public Workshop Announcement
- Origin/Destination Survey

MEETING ATTENDEES

Members

• Dick Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of 520
• Doug Baker	Washington Trucking Association
• Dan Becker	Points Communities
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Peggy Gerdes	North Lake Neighborhoods
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Tom Heller	Seattle Neighborhoods
• Jim Hill	Eastside Business
• Jim Horn	Washington Legislature
• Rosemarie Ives	City of Redmond
• Doug Jacobson	City of Lake Forest Park
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Richard McIver	City of Seattle
• Rob McKenna	King County
• John Okamoto	Washington Department of Transportation
• Peter Orser	City of Mercer Island
• Cheryl Pflug	Washington Legislature

- Doug Pullen — Highway Users Association
- Rick Pusateri — Eastside Business
- Janet Ray — AAA
- Phillip Rourke — Points Communities Neighborhoods
- Scott Rutherford — University of Washington
- Cynthia Sullivan — King County
- Donovan Tracy — Eastside Business
- Ward Truess — Eastside Transportation Committee
- Eugene Wasserman — Seattle Business
- Fred Watson — No Expansion of SR 520
- Raleigh Watts — Seattle Neighborhoods
- Mark Weed — Seattle Business

Alternates

- Susan Baker — Seattle Neighborhoods
- Rich Conrad — City of Mercer Island
- Maurice Cooper — Seattle Neighborhoods
- Peter Dewey — University of Washington
- Tye Ferrell — City of Seattle
- Roy Francis — King County
- Chris Leman — Seattle Neighborhoods
- Jim MacIsaac — Eastside Transportation Committee
- Aaron Ostrom — 1000 Friends of Washington
- Henry Paulman — T.R.U.S.T.
- Dave Russell — Sound Transit
- Andrew Schmid — King County
- Noel Schoneman — City of Seattle
- Doug Schulze — Points Communities
- Larry Springer — City of Kirkland
- Ed Switaj — City of Seattle
- Dick Taylor — City of Lake Forest Park
- Fred Watson — No Expansion of SR 520

Seats Not Represented

- Ken Jacobsen — Washington Legislature
- Ed Murray — Washington Legislature
- Phil Noble — Eastside Neighborhoods
- Debbie Treen — City of Bothell

Public, Media, Staff

- Brian Ramey — Brooklyn, University District
- L. Bader — RBCA
- Barbara Roberts — Sullivan
- Jan O'Connor — League of Women Voters

• Johannes Kurz	Snohomish County DPW
• WM Moritz	Cascade Bicycle Club
• Ann Martin	King County
• Rich Tharsten	1000 Friends of Washington
• Elizabeth Davis	League of Women Voters
• Mike Foley	Southlake Union
• John Steven	Self
• Wallis Molz	Seattle Press
• Philip Grege	Seattle
• Rich White	Bellevue Chamber
• Elizabeth Newstrum	

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
BEST WESTERN EXECUTIVE INN, SEATTLE, WA
MAY 21, 1999—10:00 A.M. TO 4:00 P.M.

INTRODUCTIONS AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed attendees to the Trans-Lake Washington Study Committee meeting. She noted that a large amount of technical information will be provided to the group today and issues and questions for further discussion will be tracked and followed. Pat suggested that the Study Committee should not be concentrating on reaching decisions today, but rather on understanding the information presented to them by the technical team. The Study Committee will have time to discuss the process for forming its final recommendations based on the evaluation information.

Renee Montgelas, WSDOT, provided an update on the legislature's decision on the transportation budget. It includes funding for moving forward after the Study Committee reaches its recommendations on public outreach and initiating the EIS alternatives phase of the study. She will bring more specifics on the budget to the meeting on June 2nd.

PUBLIC COMMENT

Philip Grega commented that the Study Committee should remember to examine the issue of capacity between I-5 and Bellevue. He recommended examining the effects of peak hour tolls on SR 520. Additionally, park and rides and garages should be constructed on the Eastside. The University of Washington's parking lot in Montlake could be used more efficiently to provide better transit access.

Maynard Arsove, No Expansion of 520, explained that a letter had been distributed to the Study Committee highlighting the importance of addressing congestion on Seattle arterials. In his opinion, the biggest problem is addressing additional vehicles entering the Seattle area and driving on neighborhood streets. The potential for a earthquake should also be examined in detail to determine placement of corridors. He expressed concern that congestion pricing as a potential solution will cause more cars to shift to the city streets.

Dave Petrie, Petrie Transit Consultants, told the Study Committee about an option of using a car-bus to move people across Lake Washington. He stated that this mode could carry four times the number of cars as currently move across the SR 520 corridor. Mr. Petrie feels that car-busses are the only solution for congestion and a good cure for the Trans-Lake Washington congestion problem. Petrie Transit Consultants has created a proposal that shows a car-bus in the region at a cost of $2.5 billion. Rosemarie Ives, City of Redmond, requested additional information on the option. Mr. Petrie agreed to provide the information and added that the proposal has been given to the Sound Transit Board.

PRELIMINARY EVALUATION RESULTS FOR POTENTIAL SOLUTIONS -- TUTORIAL

Jeff Peacock, Parametrix, presented an overview of the technical evaluation material to the Study Committee. He explained that the criteria developed by the Study Committee had been used in developing the evaluation results. Some information is still being generated, but there should be enough available for the Study Committee to begin comparing the solution sets.

Jeff informed the group that regional projections indicate person trips will be growing by 48 percent by the year 2020. The regional mode split shows 97 percent use of SOV today and 95 percent use by 2020. The study area is projected to be at 83 percent SOV use under the No Action alternative by 2020. Under the Maximize Alternatives solution, the percentage of SOV use drops to 54.5 percent. He explained that this solution also showed the largest decrease in the number of general purpose (GP) trips served. Another summary level chart was provided to the committee showing the travel time for GP and HOV. The No Action solution set proved to have the slowest average travel times, however, the range of times was not large until the solution sets with the most drastic changes were considered. These times are important as the efficiency of the system is usually measured by the number of people able to travel through a corridor. Jeff also showed a summary of the impacts to natural resources and sensitive areas, as well as the neighborhoods and communities.

The capital costs do not include mitigation, which will be discussed in more detail on June 2nd. The No Action solution cost is $0.37 billion and Roadway/Bus solution cost is $8.17 billion. Previously, the technical team determined, and the Study Committee agreed, that a surface route from Kirkland to Sand Point would be infeasible due to the high number of displacements, so it was placed in a tunnel underground. In initial discussions with Study Committee members, interest has been shown in the Maximize Alternatives solution due to the traffic relief it could provide to the corridor. The set contains a rail line in the SR 520 corridor as well as the I-90 corridor. Also, one lane of GP would be converted to HOV and a pricing strategy would be introduced in two forms – tolls and increased parking fees. The model shows that demand for cross-lake travel drops and people tend to change their lifestyles when pricing is introduced. The population growth in the region would begin to center their lives on just one side of the lake due to the expense in traveling across it.

In considering the new crossing from Kirkland to I-5, the model revealed that 88,000 additional trips would be using Sand Point Way and 124th in Kirkland. Jeff cautioned the Study Committee to think about the quality of life of the people and businesses residing in that area if that amount of traffic was flowing through these arterials. Results of the rail ridership showed that 17,000 people would use this mode traveling across the lake. He cautioned the committee to remember that the model was not picking up those people traveling from Bellevue to Redmond and other cities on the Eastside. Therefore, the estimated ridership numbers for rail may be low. He added that while roadways are fixed once built, rail has options for adding capacity at a reasonable cost.

The committee discussed the following issues:

- It is difficult, if not impossible, to take technological advances into consideration when making a recommendation. Even telecommuting may be misrepresented in the analysis due to its increased acceptance and faster modems since 1995. King Cushman, Puget Sound Regional Council, commented that a study on telecommuting has been conducted and that it could be a factor contributing to the urban spread. However, these people will still be taking tips and using the same corridors. Telecommuting may have an effect on the work commute, but not a dramatic effect on the total trips taken in the study area.

- Rosemarie Ives commented that the Eastside does not have the same number of transportation mode options as Seattle. She questioned why 3+ HOV lanes were used only on SR 520. Jeff Peacock stated that there is a design issue with the HOV lane on SR 520, which is a widened shoulder. Rob Fellows, WSDOT, added that there is a bottleneck getting on the bridge where three lanes has to merge to two to enter the bridge. If the number of people in the HOV lane increased, this would become more of a problem.

- Several Study Committee members requested information on a breakout of HOV and SOV trips across SR 520.

- What types of congestion pricing are included in the model? Congestion pricing was used in the model at an amount of $5 per round trip. It could be easily implemented on SR 520 and I-90, but would be more difficult on SR 522.

- What is the proposed parking increase? The increase would be $.50 per day around the region.

- How much money would be generated from pricing strategies (parking increases, tolls)?

- What would the economic impact on the commercial business districts from parking increases?

- Light rail at grade is currently being considered. The technical team is also considering above grade rail as well as technologies other than light rail. These findings will be discussed in more detail at the June 2nd meeting.

- Rail ridership is a function of travel time, including factors like the length and number of stops, and how the travel time competes with other modes in the corridor.

- The technical team should look at how rail is being used in Vancouver, BC and Portland, Oregon.

- Can the committee be provided with a breakdown of the east verses west trips for all the solution sets?

- A request was made for a short briefing on the origins and destinations of trips based on information already provided by the technical team.

- What is the growth rate for King County alone?

- Donovan Tracy asked why ride-sharing was not as common in other parts of the region as in the Trans-Lake Washington study area. Jeff replied that as congestion levels rise, more people shift to ridesharing. It is a function of urbanization, and it is easier for commuters from the southern parts of the region to drive in SOV lanes currently.

- Examine the costs and options involved in having faster rail implemented. Jeff commented that the model does show an increase in ridership with fewer stops on the rail.

- The model does not take into account breakdowns that can occur in the transportation system.

- The center lane of I-90 carries 55,000 people per day. Placing rail on I-90 would require building another lane in each direction and is very expensive. Its productivity is only 25 percent of GP per day.

WHAT ARE THE EVALUATION RESULTS TELLING US ABOUT THE CORRIDORS AND MODES?

SR 522 Corridor

Jeff discussed the SR 522 corridor findings. He stated that the MTP '98, MTP Flipped, and New Crossing solution sets were nearly identical when run through the model. The addition of HOV lanes in the Roadway/Bus solution set created displacements, barriers in the community, impacted critical areas, parks and water quality. Jeff stressed that the solution sets were comparable because they used the same method of calculating the data.

The committee discussed the following issues on the SR 522 corridor:

- Travel speeds are calculated for GP traffic only.
- Why is there not a decrease in travel time proportionate to the decrease in vehicles? Cathy Strombom, Parsons Brinckerhoff, replied that the peak period in 2020 will rise from four to five hours.
- In terms of adding HOV lanes, it comes down to deciding how many displacements are acceptable to increase the person throughput.
- Can the technical team examine transit only on SR 523?
- Travel speeds should be broken down by SOV and transit.
- Transit priority lanes should be considered on SR 523.
- Many people from the region have to take SR 522 because there are no other options.
- Transportation Demand Management (TDM) will not work on SR 522.

Kirkland to Sand Point Corridor

Jeff explained the results of the solution sets from Kirkland to Sand Point. The options for the corridor involve creating a six lane freeway, a four lane alterial, and/or a ferry. The six lane freeway gives the best performance, but at a huge cost and high impact to I-5 and I-405. The impact to Sand Point Way would be great – an estimated 37,000 vehicles would be directed onto the arterial.

The committee discussed the following issues on the Kirkland to Sand Point corridor:

- This new corridor is important because it will alleviate pressure on SR 520, I-90, and SR 522 by giving people another choice.
- Sand Point Way can only carry 40,000 vehicles and is already a congested arterial.
- A new crossing would be valuable if the impacts on the University District can be addressed. Light rail between Redmond and the University of Washington should be examined.

- Mitigation costs are not included in the new crossing option. The figure could be closer to the Roadway/Bus solution set once this is added.

- The Roadway/Bus option has 16,000 feet of tunnel and extremely high lighting and ventilation costs.

- Light rail has not been ruled out in the new corridor.

- Even though the model did not predict high ridership numbers for the ferry, it could be a successful mode. The best option would be from Kirkland to the UW or Madison. There are several waterfront impacts to consider.

I-90 Corridor

Jeff stated that in the I-90 corridor, two-way HOV lanes and rail have been considered. Different rail alignments have been created. Another option is to introduce pricing which actually causes speeds to drop. The Study Committee should concentrate on deciding whether or not to add rail to the corridor and convert the center lane for this use.

The committee discussed the following issues on the I-90 corridor:

- There are ongoing discussions about what changes to make I-90, which the Study Committee may not be able to impact.

- There are wetland impacts associated with changes on I-90.

- Semi-trucks will use I-90 regardless of pricing strategies and the number of trucks on the roadways will be growing in the future.

- The Study Committee could recommend examining rail across I-90 even if not responsible for the ultimate decision.

- Electronic tolls are available to avoid slowing traffic.

SR 520 Corridor

There are many options associated with SR 520 including adding one lane in each direction to HOV, conversion of GP to HOV, addition of light rail, and transit. The model showed that tolls have a dramatic effect on the number of vehicle trips. People will generally change the route they use, then change the mode, and finally their destinations.

The committee discussed the following issues on the SR 520 corridor:

- The same number of trips are being taken across the lake, but in the Maximize Alternatives package they have a different destination. The congestion in the study area is not changed by these options.

- Can the elements of the solution sets be broken out and not be interlocked. The analysis of SR 520 analysis may be affected by what is happening in other corridors in the solution sets.

- HOV went down by 30,000 and transit only up by 2,600 in the MTP. Carpools would be lost, and bus riders would not gain proportionally.

- Converting one lane in each direction to transit should be considered as a potential option.

- Which numbers are put into the model when looking at travel speed? Travel speed is an output based on congestion, as well as in input of transit speeds.

PROCESS FOR FORMING REASONABLE AND FEASIBLE SOLUTIONS

Several Study Committee members made recommendations of options to remove from the evaluation work. Daryl Grisby stated that he appreciated the technical team's hard work on the evaluation. He proposed removing the following options from the original chart that Jeff presented to the Study Committee: 1) the six lane facility; 2) general purpose lanes only on SR 520; 3) arterial for Sand Point; and 4) SR 522 grade separation. He commented that the cost was the main factor for consideration and that there are few scenarios that would justify the large capital costs associated with these options. Bob Gillespie commented that aggressive TDM should be taken off as well, and disagreed with the options recommended by Mr. Grigsby.

Paul Crowles commented that it was too early to throw options away because mitigation has not yet been included in the costs. Maynard Arsove stated that the expansion of SR 520 depends on the connections to other arterials and highways. More technical details are needed to understand the connection to I-5, and the interaction of HOV lanes on SR 520. Eugene Wasserman added that the six lane freeway should be studied, and the bus-ferry followed. He commented that HOV on SR 522 should be removed. Donovan Tracy asked that the technical team become more involved in creating the hybrid solution sets. Anne Knight added that the elements should be defined more carefully. She feels that SR 522 is not relevant to the Trans-Lake Washington Study Committee recommendation, although some suggestions for further study could be made. Rosemarie Ives requested that the technical team think about better combinations for the solution sets. She would also like to hear about elevated light rail options at the June 2nd meeting.

Pat Serie stated that the Study Committee has agreed to finish on July 16th. In order to meet this goal, several more meetings must be held in June. She proposed several dates to the committee who agreed to meet on June 10th, 1-5pm and June 16th, time to be decided. Jeff reminded the Study Committee that the technical team would not be generating new information between these meetings, rather it would be helping the group agree on final recommendations.

MEETING HANDOUTS

- Agenda
- Public Forum Announcement
- Presentation – Key Findings
- Presentation – Travel Demand Management
- Correspondence from Maynard Arsove

MEETING ATTENDEES

Members

• Dick Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of SR 520
• Dan Becker	Points Committee
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Peggy Gerdes	North Lake Neighborhoods
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Jim Horn	Washington Legislature
• Rosemarie Ives	City of Redmond
• Ken Jacobsen	Washington Legislature
• Doug Jacobson	City of Lake Forest Park
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Richard McIver	City of Seattle
• Phil Noble	Eastside Neighborhoods
• John Okamoto	Washington Department of Transportation
• Doug Pullen	Highway Users Association
• Rick Pusateri	Eastside Business
• Janet Ray	AAA
• Phillip Rourke	Points communities Neighborhoods
• Scott Rutherford	University of Washington
• Cynthia Sullivan	King County
• Donovan Tracy	Eastside Business
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business
• Raleigh Watts	Seattle Neighborhoods
• Mark Weed	Seattle Business

Alternates

• Richard Conrad	City of Mercer Island
• Maurice Cooper	Seattle Neighborhoods
• Peter Dewey	University of Washington
• Tye Ferrell	City of Seattle

- Roy Francis — King County
- Connie Niva — Washington Transportation Commission
- Henry Paulman — T.R.U.S.T.
- Dave Russell — Puget Sound Regional Council
- Andrew Schmid — King County
- Noel Schoneman — City of Seattle
- Larry Springer — City of Kirkland
- Ed Waitaj — City of Seattle
- Dick Taylor — King County
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of SR 520

Seats Not Represented

- Doug Baker — Washington Trucking Association
- David Cortelyou — Seattle Business
- Jim Hill — Eastside Business
- Rob McKenna — King County
- Ed Murray — Washington Legislature
- Cheryl Pflug — Washington Legislature
- Debbie Treen — City of Bothell

Public, Media, Staff

- David Allen — Transportation Choice Coalition
- Phillip Grega — Concerned Citizen
- Johannes Kurz — Snohomish County DPW
- Ann Martin — King County DOT
- Len Newstrum
- Dave Petrie — Petrie Transit Consultants
- Tromjarr Tanner Starks — Seattle Chamber
- Andrea Tull — Sound Transit

DRAFT MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MUSEUM OF HISTORY AND INDUSTRY, SEATTLE
JUNE 2, 1999 10:00 A.M. TO 4:00 P.M.

WELCOME, INTRODUCTIONS, AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed members of the Trans-Lake Washington Study Committee and other attendees. She reviewed the agenda that included discussions on the remaining evaluation results for potential solutions, mitigation opportunities, and rail options.

PUBLIC COMMENT

Chris Leman shared that his neighborhoods in Seattle has been very concerned with many aspects of the study that favor the expansion of the SR 520 bridge or building a new bridge. He mentioned that the Metropolitan Transportation Plan (MTP) calls for HOV lanes across the SR 520 bridge, however, he cautioned the group that one cannot assume that the lanes should be built by new construction. Assuming that the MTP leads to new lanes is an unfortunate assumption that reflects the bias of the study. The Maximize Alternatives solution set includes the controversial issue of tolling. It is biased to have the other alternatives be mixed with the controversial issue of tolling in that solution set. The neighborhoods are very skeptical and feel that the process is not fair. They feel that the models are biased because they assume that everyone using the HOV lanes is legally there—when most of the people using the lanes are illegally using them. He is also concerned that the lanes would be initially assigned as HOV lanes and then be changed to general purpose lanes.

MODELED SENSITIVITY TEST

Jeff Peacock, Parametrix, provided the following information regarding modeling results of the solution sets. When transit-only lanes are added on SR 520 using the MTP solution set, general purpose traffic is minimally affected and there are 2.4 percent fewer vehicles, and 3.2 percent fewer people on the roadway. The HOV traffic is also affected with about 10,000 fewer vehicles and about 31,000 fewer people on SR 520. Jeff stated that about 14,000 people per day will shift to I-90. The bus transit on SR 520 increases under this solution set by about 12 percent or 2,600 people. Overall, the person throughput decreases 14 percent.

Using the No Action solution set and converting one general purpose lane on SR 520 to HOV lanes produces the following results. The HOV/bus person throughput increases by 22,500 persons. The overall person throughput in the corridor drops by 20 percent, from 175,500 to 141,600. I-90 is minimally affected. The remaining demand for the general purpose lanes of 69,000 vehicles results in the lanes operating at theoretical capacity for 17 hours per day. The merging and weaving between the lanes near the interchanges will result in stop-and-go traffic that affects both the HOV and general purpose lanes during the peak periods. The backups on SR 520 will "ripple" into I-5 and I-405 throughout the day.

Jeff Peacock also presented the results of adding pricing on the Trans-Lake corridors. He stated that the model was run with a $5 round trip toll, and $0.50 per day parking increase. The overall traffic is significantly reduced by nearly 232,000 vehicles. The HOV/bus person throughput increases by about 47 percent (43,000 people). Pricing at the corridor level significantly reduced the overall corridor travel while it increased the ridesharing/transit use. The 230,000 vehicles not crossing the lake are added to the transportation system on each side of the lake as people avoid the tolls.

The following items reflect the SR 520 corridor modeled with six general purpose lanes and two HOV lanes. The SR 520 corridor would carry a total of 270,000 person trips per day and a total of 178,000 vehicle trips per day (164,000 general purpose, 14,000 HOV). The total trips in the Trans-Lake area would be 12 percent fewer than the Roadway/Bus solution set. And this option would support a 46 percent increase in vehicle trips from the No Action alternative.

The following issues and questions and answers regarding the modeled sensitivity tests were discussed:

- Why does transit increase by only 12 percent? The MTP is already doing a good job providing bus service in the 520 corridor.
- Are there calculations for time of travel? The MTP shows the general purpose traffic lower, the HOV fairly free flowing.
- Why does the general purpose traffic go down with less HOV traffic? It is difficult to explain why that occurs.
- The model assumes unimpeded HOV access, but does not make assumptions about design, such as direct access ramps or other HOV treatments.
- Are there improvements for transit and general purpose? Yes, during peak periods the general purpose lanes are at capacity.
- There would be additional capacity for buses in the HOV lanes if added across SR 520.
- Is it legal to impose tolls on existing roads? TEA21 includes a provision for pricing to be considered.
- Look at New York as an example. Toll revenue is put back into transit/buses and increased service.
- Need to look at the land use plans for centers and compare the difference in terms of mobility.
- Would tolls be penalizing people going across the lake? The diversion to north and south are issues to be considered carefully.
- Should pricing be applied at a regional level?
- What will be the impact on travel if there is a toll on I-5 and I-405?
- Is data available which distinguishes between SOV and commercial traffic, including mail, freight, UPS and commercial?
- The merging and weaving problems on SR 520 at I-5 and I-405 should be considered.

OPERATIONAL SYSTEMS PRESENTATION

Jeff Peacock presented information on operational issues which may impact the solution sets. The current data shows that 90 percent of the time there is stop-and-go traffic on SR 520. The data supports that as the

traffic increases the stop-and-go traffic will start to increase during the middle of the day—so the frequency of congestion is always high, all day. Additionally, the data demonstrates that I-405 and I-5 are experiencing queues and near-capacity volumes.

The following issues, questions and answers session regarding the operational issues were discussed:

- Additional general purpose lanes on SR 520 may not be desirable because stop-and-go traffic will exist all day.
- How is SR 522 affected in this scenario? Under the maximize alternatives solution set, volumes would drop on SR 522 and increase on I-405.
- How freight fits into the system and is impacted by traffic needs to be reviewed.

RAIL

Jim Parsons, Sound Transit, presented specifics of rail operations, including how a potential line coming from the east on SR 520 or I-90 would fit into the main line between south Seattle and the UW. The 2020 ridership forecast on the north line is 11,300 per hour and this figure balances the sum of the east and south lines. He stated that balanced loading in the critical segment is an optimized capital investment.

The following issues and questions and answers regarding the rail presentations were discussed:

- How can we deal with the increased demand from the SR 520 line? What would happen between 45th and the Pacific Street station? Jim stated that it would be difficult to build given the depth required for a tunnel and disruption.
- Operational analysis has long range forecast for rail in the I-90 corridor. Large demands were not shown in the I-5 and I-405 corridors.
- Is there a special distribution between population and employment? Sound Transit conducted one long range forecast with full build out of the system.
- The trip distribution is based on the network of service provided.
- An advantage if the line goes to Westlake could include a Seattle Center stop.

RAIL TRANSIT OPTIONS

Mark Scheibe, Parson Brinkerhoff, presented information on transit including an overview of characteristics and assumptions for the Trans-Lake Washington solution sets. Transit characteristics include: running speed, station spacing, dwell time, alignment constraints, and vehicle top speed. Examples of technologies around the world were shared including rail technologies (regional rail, heavy rail, light rail and automated light rail), rubber-tired technologies (metro, automated guideway transit, monorail) and magnetic levitation.

Tom Albro, Monorail Operator, Elevated Transportation Company, commented that technology is a much less important decision than the need to choose what the region will look like in the future. He asked the committee to focus on what the region will look like in 2050 to drive. The marketplace for technologies is broad.

The following issues and questions and answers regarding rail options were discussed:

- What would the speed be if there were one or two stops versus six or seven? With more stops, the model assumes trip times of 25-30 mph with stations at 3-5 miles. Decreasing the number of stations may cut travel time by two-thirds to one-half.

- Not all trains would have to stop at the University District—there may be demand for express operations to Downtown.

- Rail in the SR 520 corridor would most likely require a full parallel infrastructure with a full parallel system.

- How does wind affect the train? No effect is felt by wind; there are modest dynamic movement in storms.

- Most comparisons show rail carrying as many people on express buses as rail.

- Modeling did not take into account constraints in downtown Seattle with existing bus routes.

- The Study Committee was cautioned about comparing only numbers associated with bus and rail. Need to consider rail stations for example and the impact on land use changes over time. Another consideration is how much capacity exists in the system.

- Is a rail system more reliable?

- Is there constraint to stay at a 400 foot train? Longer dwell time in stations would make the system less attractive.

- Where would the rail over SR 520 go after it reaches the Eastside?

- Question of safety and reliability? Exclusive right-of-way? Grade crossings present potential conflict.

- How do we aggregate demand so there is enough people to ride to make worthwhile?

- There are many employment centers in Redmond—don't just stop in Overlake.

- Scenarios have been based on existing tunnel. What about the history of other technologies?

PUBLIC WORKSHOPS

Public meetings have been held throughout the area to review the potential solution sets. The agenda included a presentation by Jeff Peacock regarding the study and the solution sets. Attendees were then invited to engage in a facilitated discussion. Each table was marked with a solution set, and people were asked to go to a table and share their preferences. Green dots were place on the elements of the solution sets that they liked the most. Red dots were placed on the solution sets they liked the least. The Montlake meeting chose to hold a traditional public meeting with time for attendees to provide testimony. Forty

people attended the Kirkland meeting, 125 were in attendance at the Montlake meeting, and 48 were at the Bellevue meeting.

Margaret Norton-Arnold presented a preliminary summary of what was heard at each of the workshops. After the final workshop is held next week, a summary will be prepared which will include all the input heard.

The following issues and questions and answers regarding public involvement efforts were discussed:

- How many of the attendees use the SR 520 corridor? That question was not asked at the workshops.
- At the Kirkland meeting more than one-half of the attendees did not live in Kirkland.
- There was a lot of opposition in Montlake to expansion of SR 520 because of impacts to the neighborhoods.

MITIGATION

Jeff Peacock presented information on how mitigation may be included in the solution sets. Mitigation measures such as a lid from east end of Lake Washington to Bellevue Way was proposed by three city councils. It is technically feasible to accomplish that, however, some of the areas lend themselves to lidding more than others. To lid in some areas would mean lowering the roadway. The approximate cost of the lid proposed by the councils is $2 billion. Problems of noise are common to a variety of transportation facilities—some of the noise is there presently. Other factors to consider are water and air pollution, and connections within neighborhoods.

The following issues and questions and answers regarding mitigation were discussed:

- What is reasonable and feasible in terms of mitigation? What conditions in the Montlake area must be considered?
- Could the noise problem at the Portage Bay viaduct be mitigated?
- Costs of lids would be approximately $491 million on the west side. That would not address other impacts in Montlake or the Portage Bay areas.
- Would the lid need venting facilities? Ventilation is a huge issue where there is a tunnel in the roadway. Ventilation is directly proportional to the amount of area covered by a lid.
- Costs of mitigating SR 520 should be shown relative to the new crossing in a floating tunnel.

STUDY COMMITTEE DISCUSSION OF PROS AND CONS IN INDIVIDUAL TRANSPORTATION CORRIDORS

Overarching Questions/Issues

- Coordination with the local government planning processes

- Implementation of GMA plans
- Avoid shifting traffic to I-90, I-405, and I-5
- How many SOVs do we want to accommodate in the east-west corridors?
- Ferries—preference for private operations and/or public facilities
- Look at the I-5 and I-405 limiting factors on proposed changes to SR 520
- Establish continuing inter-local corridor planning process
- Is land use beyond committee authority?

Rail

- Accommodate in corridors, wait to see how current systems perform
- Don't address rail on I-90, but preserve option on SR 520
- Support for high capacity transit on SR 520
- Give preference to SR 520 connecting major activity centers with express rail
- Consider system compatibility
- Look at cost/benefit of rail compared to other alternatives for ridership levels
- Focus on rail for long-term planning

Bicycle/Pedestrian

- Include with all options
- Consider connections into Seattle and the Eastside
- Include fishing piers
- Consider impact on bicycle/pedestrians from new or changed intersections

SR 522—what works?

- Transit lane, combined with SR 523 priority treatments
- Consider other east-west corridors as alternatives to SR 523
- Treatment through Lake City is not settled—objections exist
- Work with local communities to minimize impacts
- Look at grade separation at 68th
- Consider transit-oriented development in the SR 522 corridor

I-90 – what works?

- Leave it alone – it works fine
- Consider shoulder use for bus and/or HOV
- I-90 is the primary freight corridor
- Accommodate rail, then move on.
- Carpool/bus in center roadway carries more people than rail – car pool/vanpool ridership equals transit regionally
- Don't preclude future rail for when densities increase
- Provide for rail possibility on SR 520 – reserve decisions for Sound Transit – don't foreclose options for I-90 area communities
- In long run, preserve options for both rail and HOV
- Beyond urban growth, infrastructure, densities don't support rail option

SR 520 – what works?

- Preferred corridor for rail--look at faster options, consider other specific alignments (Westlake alignment)
- Focus on lines that don't stress Seattle tunnel capacity
- More capacity – general purpose
- New bridge that adds shoulders and removes "wiggley bits"
- HOV
- Bicycle and pedestrian lane
- Consider pull-out areas instead of continuous shoulders
- Eliminate HOV merge at bridge
- HOV-dedicated access connections

Kirkland/Sand Point/UW – what works?

- Ferries
  - needs public subsidy
  - may be private only – would Sound Transit want to do that?
  - passenger ferry strongly preferred
  - consider other routes
  - consider integration with the transportation system
  - private operation, some public facilities

PUBLIC COMMENT

Leonard Newstrom suggested that the Study Committee look at a specific alignment to put in a new monorail bridge with rubber tired electrical vehicles with downtown Seattle and Capitol Hill connections. The existing SR 520 corridor could be used so that no new right-of-way would be required. The same concept could put another monorail bridge from Sand Point to Kirkland. There have been questions about whether monorail can go up grades; rubber tires make this possible. Use of a monorail system would be beneficial because it uses existing right-of-way with minimal disruption and is extremely reliable. It would also address the City of Seattle resolution for no additional general purpose lanes traveling into the city.

Mr. Dave Petrie, Petrie Transit Consultants, supports a car bus mass transit system to address the current congestion problems. The federal government is interested in a demonstration of the car bus. A chunnel, similar to that between England and France, uses the same principles. The car bus system would carry 800 cars and use the existing bridge with an inside lane being dedicated to HOV. The following items would have to be built: stations, tractors, carriers and auto bus.

MEETING ATTENDEES

Members

• Jean Amick	Seattle Neighborhoods
• Richard Conlin	City of Seattle
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods

• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Nona Ganz	City of Kirkland
• Mary Gates	Sound Transit
• Peggy Gerdes	North Lake Neighborhoods
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Rosemarie Ives	City of Redmond
• Doug Jacobson	City of Lake Forest Park
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Phil Noble	Eastside Neighborhoods
• John Okamoto	Washington DOT
• Peter Orser	City of Mercer Island
• Cheryl Pflug	Washington Legislature
• Doug Pullen	Highway Users Association
• Rick Pusateri	Eastside Business
• Janet Ray	AAA
• Phillip Rourke	Points Communities Neighborhoods
• Scott Rutherford	University of Washington
• Donovan Tracy	Eastside Business
• Ward Truess	Eastside Transportation Committee
• Eugene Wasserman	Seattle Business
• Raleigh Watts	Seattle Neighborhoods
• Mark Weed	Seattle Business

Alternates

• Susan Baker	Seattle Neighborhoods
• Maurice Cooper	Seattle Neighborhoods
• Kingsley Joneson	Seattle Neighborhoods
• Jay Lawley	Washington Trucking Association
• Chris Leman	Seattle Neighborhoods
• Jim MacIsaac	Eastside Transportation Committee
• Henry Paulman	T.R.U.S.T.
• Dave Russell	Puget Sound Regional Council
• Andrew Schmid	King County
• Noel Schoneman	City of Seattle
• Doug Schulze	Points Communities
• Ed Switaj	City of Seattle
• Dick Taylor	King County
• Mitch Wasserman	Points Communities Neighborhoods

Seats Not Represented

• Maynard Arsove	No Expansion of 520
• Robert Gillespie	Eastside Business
• Jim Hill	Eastside Business
• Jim Horn	Washington Legislature
• Ken Jacobsen	Washington Legislature
• Rob McKenna	King County
• Ed Murray	Washington Legislature
• Ron Sims	King County
• Debbie Treen	City of Bothell

Public, Media

• G. Anderson	BRG
• Jim Arndt	Kirkland
• Patricia Dorratcague	Juantita Drive, Kirkland
• Seymour Feldon	
• Johannes Kurz	Snohomish County
• Ann Martin	King County
• Dave Petrie	Petrie Transit Consultants
• Mary Pneuman	LVW – Lake WA East
• Ashley Probart	LTC
• Al Rasmussen	Ravenna Bryant Comm. Association
• Susan Sanchez	Seattle Strategic Planning
• Goran Sparrman	City of Bellevue
• Betty Spiern	Kirkland Chamber
• Andrea Tull	Sound Transit

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
UW CENTER FOR URBAN HORTICULTURE, SEATTLE
JUNE 10, 1999 1:00 P.M. TO 5:00 P.M.

INTRODUCTION AND ANNOUNCEMENTS

Pat Serie, EnviroIssues, welcomed the Trans-Lake Washington Study Committee. She reviewed the agenda and informed the group that they would hear a presentation on the preliminary findings of the origin/destination as well as community survey information. In addition, several members had created proposals to present to the group for consideration. The meeting would conclude with a discussion of the next steps in the process to reach consensus and create a final recommendation.

PUBLIC COMMENT

Paul Demitriades, City of Medina, addressed the issue of financing schemes in the Trans-Lake Washington Study. He expressed concern over the probable lack of public support for tolls, especially at a $5 round trip cost. Paul stated that the committee should not support the idea of tolls, and that the public officials are required to listen to the public on the issue. Most communities in the study area have passed city council resolutions against pricing schemes. He added that Referendum 49 and the MTP should be used for financing in the corridor. He concluded that tolls are an aggressive strategy, will reduce freight mobility, and he urged the committee to stop considering tolls in the recommendation.

Daniel Bray, T.R.U.S.T., stated that the evaluation of solution sets in the study has given some productive answers. He added that the Maximize Alternatives solution set, at a cost of $8 billion, would carry the most people through the corridor. He commented that the model has given excellent results and that the committee was on track to make a solid recommendation. In addition, he suggested that the technical team take the results from the model and compile a new solution set for the Study Committee to review.

Nancy Adams expressed concern for the preservation of sensitive natural areas in the Trans-Lake region. She asked the committee to focus on integrated solutions which would examine the region as a whole. The Arboretum on the Seattle side of the lake and the Wetherall Nature Preserve on the Bellevue side are precious areas which must be protected in all recommendations. She commented that she once saw bald eagles around the Wetherall Nature Preserve, but that urban growth has reduced their numbers. The origin/destination survey has proven growth and more traffic in the north and northeast end of Lake Washington. She urged the committee not to destroy the beautiful areas by widening SR 520. This is not a viable solution because I-5 and I-405 are already crowded and congestion will simply transfer to these corridors.

REMAINING INFORMATION INPUTS

Preliminary Results of the Origin/Destination Survey

Bruce Brown, Pacific Rim Resources, presented the preliminary findings of the origin/destination survey to the Study Committee. He reviewed the process in taking the surveys, presented information on the statistical validity of the results, and covered the important findings in the study. The origin/destination study was conducted during peak traffic hours on May 4th and May 5th, in both eastbound and westbound lanes. A total of 59,415 license plates were videotaped, of which 1,064 were eliminated due to out-of-state plates, and 11,587 were eliminated because they were duplicate plates. The remaining 46,764

unique plates were sent to the Department of Licensing where 42,691 were matched to addresses. A proportional stratified random sample of 16,000 was taken from this information, and the surveys were mailed.

Bruce explained that the actual percentages of traffic on the corridors is as follows: SR 520 at 33 percent, I-90 at 47 percent, and SR 522 at 20 percent. The returns of surveys matched these percentages almost exactly in each corridor. Survey results showed that 93 percent of the people were on their usual route, and that 95 percent were on one portion of a round trip. Additionally, 89 percent of those responding to the survey were in an SOV with 88 percent commuting to and from work. Bruce then presented a map with a dot for the origin of trips and arrows showing the destinations. The survey was not structured to reach transit or vanpool users. The Metro database is available from which the technical team hopes to pull relevant information for the Study Committee to review.

In addition, the survey addressed perception questions about safety, reliability, and congestion by corridor. Answers show that the safest route was SR 522 with SR 520 the most dangerous. The most congested route is SR 520, and the most common method of dealing with this problem is "to leave early." Most of the people answering the survey do not have trip reduction plans through their employer. A variety of reasons were voiced for using the SOV option including: buses do not meet travel needs, pre and post work errands, preference for driving a car, inflexible work hours, inability to leave in an emergency, and a need to use a car for work.

The committee discussed the following issues:

- Can commercial vehicles be identified by examining the license plate numbers? Bruce responded that this is covered by putting a question in the survey addressing commercial vehicles.

- Buses and vanpools were not surveyed. This should be made clear in all of the information presented on the survey.

- The maps do not show the distribution of trips coming off the main freeways.

- The committee asked for clarification on the zones of the survey. Several members asked for zone designation on the map or in a summary table.

- The employment number in Redmond was 44,000 in 1995, and is now approximately 57,000; this may explain the change in origin/destination numbers from the 1995 PSRC data.

- Many people have social and recreational activities after work, making the commute much lighter.

- Can the license plates not matched to an address be examined to determine if they are truck plates.

- Comments on the survey result presentation can be sent to Bruce Bury by calling 206-623-0232 x207 or e-mail at bruce@prr-seattle.com.

Community Survey

Martha Cepress, Pacific Rim Resources, presented the preliminary findings of the community survey to the Study Committee. The survey was structured to reach people using all forms of transportation around the region. In total, 1,067 phone interviews were conducted in 39 different zip codes. Of the corridors involved in the Trans-Lake Washington Study, I-90 was the most frequently used. Martha explained most people surveyed answered that congestion is the biggest problem in the region. The least number of people favor making no changes to the present system, and most favor adding rail. When people were asked the likelihood of using the improvements, general purpose lanes received the most support. She cautioned the group not to draw too many conclusions from the initial results; more information will be generated as the data is cross tabulated.

The committee discussed the following issues:

- The least favored improvements is tolls (20 percent), general purpose (11 percent), no change (10 percent).
- Those surveyed may support rail so that there will be more room in the general purpose lanes for them to travel.
- The numbers from the community survey are representative of the region as a whole.
- The most important factors influencing the favored improvements were allowances for movement, decrease in travel time, choices other than auto, and improved safety.
- There are air quality concerns associated with several options in the solution sets.

Public Workshops

Doug Hurley, CH2M Hill, briefed the Study Committee on the public workshop held on June 3rd in Lake City. He commented that public responses were similar to the Bellevue and Kirkland meetings. When the group of about 35 divided into solution set discussion groups, about 8 people concentrated on the maximize alternatives area, no one went to new crossings, and about 3 people chose the roadway/bus solution set. Attendees were positive about rail options.

REASONABLE AND FEASIBLE SOLUTIONS

Pat Serie, EnviroIssues, stated that the Study Committee had been extremely productive in the last discussion regarding corridor options. She asked members to consider the SR 520 corridor, the option of ferries, and several other topics which were not included in the previous meeting's discussion.

The following issues were discussed by the Study Committee:

Ferries

- Keeping passenger ferries as an option is important for providing additional connections and choices to residents of the northeast region.
- Are there any speed requirements for ferries?

- Discomfort was expressed in endorsing the ferries when the model showed that the passenger numbers would only be around 200.

- There will be too many issues surrounding the creation of Park and Rides for a passenger ferry to be effective.

- An agency other than WSDOT is needed to carry out this option. Public funding is necessary to finance the project.

- Examine the value addition of ferries versus additional transit. If ferries take ridership from other modes, it is not worth pursuing. As it stands, funding would be taken from the existing system and put towards ferries while it might be better spent on the existing system.

- There is a ferry from West Seattle to downtown that is a public/private partnership. It runs in good weather only, but carries a good number of people during its operation (700-900 per day).

- The proposal calls for the ferry to dock at the waterfront activity center at the University of Washington. Passengers would be required to walk 15 minutes to campus.

SR 520

- Jean Amick presented low cost ideas which could quickly be implemented on SR 520 and SR 513. She recommended that the Study Committee consider sending these ideas forward in a final recommendation. 1) WSDOT radio traffic alerts to reflect conditions on SR 513; 2) addition of small signs on Montlake Blvd. to alert vehicles of alternate routes; 3) HOV lanes southbound on Montlake; 4) better monitoring of the red light on the freeway entrance to prevent the Montlake backup; 6) more bicycle crossings; and 7) keeping the Montlake bridge down during peak hours.

- A sign should be added on SR 520 reminding drivers to maintain their speeds. Additional signs may be painted in the lane as well.

- If SR 520 is going to continue to function, I-5 must be improved. The express lanes should be reversible.

- Transit can be metered onto the freeway and preferential treatment should be given to buses on the Arboretum ramps.

- Remove the ramps at the Arboretum.

- Rail technology can not be proven as reasonable and feasible and should not be considered on SR 520.

- Expand or improve road alignments.

Members Proposals for Reasonable and Feasible Solutions

Donavon Tracy, Eastside Business, commented that he had hoped the group would be able to find a common theme and that the process would define the problem before creating alternatives to solve the problem. He presented several overarching goals and principles which he hoped the Study Committee would remember when making decisions. First, the Growth Management Act (GMA) does not mean that the region is going to be less urban. There will be a greater dependence on the transportation systems to function effectively in the future. The urban centers must be connected to meet this goal as the system can not work with the current fractures. Secondly, the system must be in balance. Finally, the freedom of choice must be protected. The high quality jobs on the Eastside support the entire region. The attitude of Eastside versus Westside will not work to solve this problem.

Eugene Wasserman, Seattle Business, presented a proposal showing options for further recommendation and options which should be omitted. He senses general support from Study Committee members on transit lane priorities on SR 522. In a environmental impact assessment process, the pontoons on SR 520 should be replaced, HOV added from Redmond to I-5, general purpose lanes added from Redmond to I-5, and rail considered in the corridor. Eugene does not support continuing to study rail on I-90. He asked the committee to begin considering enhancements and mitigation to the solution sets.

Rob McKenna, King County, presented his recommendations for the SR 520 corridor. He explained that he was attempting to provide a context for looking at the Trans-Lake problem. All the potential solutions sets should achieve the GMA goals by discouraging sprawl and connecting urban centers. There is a need to have all the options involved in the regional system. Rail, enhanced HOV facilities, linked corridors, and more coordination are among the needed improvements in the system. Rob stated that he assumes that all solution sets will include mitigation, implementation of TDM principles, bicycle and pedestrian connections, and the inclusion of improvements on SR 522. He explained that a layered approach was needed in the SR 520 corridor. General purpose lanes should be added in each direction to make SR 520 consistent with other freeways in the region. An HOV expressway should be built as a second layer on SR 520 for use by vanpools, transit, and HOV traffic. The third layer in the corridor should be rail from the University District under Capital Hill and through downtown Seattle. The rail should be elevated in the corridor, and if lids are applied to the SR 520 corridor, the rail can be added over the top.

Daryl Grigsby, City of Seattle, stated five principles for the Study Committee to consider in the final proposal: 1) connections across the lake are critical, the downtown Seattle business district depends on sales from the Eastside and other areas of the region; 2) move the most people with the least environmental, social, and physical disturbance; 3) based on the current condition on SR 520, there should be a new structure in that corridor to reflect the quality of life; 4) protect environmental assets; and 6) there should be some of the same solutions as used in the past as well as new options. He suggests transit priority lanes on SR 522. He also recommended a ferry system as an alternative in the SR 520 corridor. The City of Seattle feels that a primary concern is to make transit lanes function on SR 520. The addition of HOV traffic in the transit lane may be considered if it remains 3 riders in each vehicle as well as significant assurances that the additional traffic does not impact city arterials. Additionally, mitigation measures should be taken to reduce the impacts on I-5 and I-405. Bicycle connections and shoulders should be added on SR 520. The area surrounding the corridor is extremely sensitive and addition of new concrete should be limited. Thus, a layering approach on SR 520 is supported. Daryl added that bus fares should be reduced and congestion pricing considered to encourage transit use by commuters.

Maggi Fimia presented TDM and land use components that she feels are essential in the Study Committee's final recommendation. These components have been endorsed by 21 committee members and calls for including TDM strategies in any proposal. Although pricing is important, the recommendation is to not include that as a TDM strategy per se, but let it be researched by the PSRC's Pricing Task Force.

IDENTIFICATION OF POTENTIAL REASONABLE AND FEASIBLE ELEMENTS/SOLUTIONS

Pat Serie, EnviroIssues, explained that the Study Committee would place red, green, or yellow dots on the various options in the solution sets to serve as a straw poll of the support for each option. Red dots represented disagreement with the option, green represented agreement, and yellow meant that more discussion was needed. She emphasized that the activity was not designed to take a vote or make a decision, but that it would give the technical team an idea of the direction to pursue.

The results of the activity showed that most members were able to support or refute each option. There were few yellow dots indicating that little more discussion was needed on the solution set components. The technical team will summarize the findings and discussion from the proposals. Pat stated that it was time for the Study Committee to begin considering appropriate language and mitigation to form the beginning of the recommendation. The technical team will summarize what areas it feels the Study Committee has generally reached agreement on and what questions still need to be discussed at the June 16th meeting.

The committee discussed the following options:

- The technical team can bring back indications of what the model might say on several of the proposals, but there is not enough time between meetings to do new model runs.

- Design schematics would be helpful in considering the recommendation. For example, a conceptual design of stacking versus a normal cross section of the corridor would be useful.

- Problems could arise from air quality compliance in the SR 520 corridor. The topic needs attention by the Study Committee and the technical team. Additional vehicles in the corridor will quickly cause the region to go out of compliance.

- The challenge for the Study Committee is to produce alternatives for the EIS phase of the project. Time should be spent on the areas of questionable agreement.

- The issue of general purpose lanes will not be resolved by the Study Committee. The option should definitely go to the EIS process and go through the public process.

PUBLIC COMMENT

Elizabeth Newstrum, citizen, stated that the option of tolls should not be considered by the Study Committee. When the process of reaching a recommendation began, it focused on giving commuters better access across Lake Washington. When tolls are imposed, commuters are punished. If part of the Study Committee's task is to make the recommendation palatable to the public, tolls should be dropped.

Johannes Kurz, Snohomish County, commented that while TDM principles are critical to the transportation system, they often fall apart upon implementation. In order to implement TDM practices, the responsibility lies in the private sector. The major problem facing the region is the backlog of unmet transportation facility improvements.

MEETING HANDOUTS

- Agenda

- June 2, 1999 Flipcharts
- Consideration of Lids on SR 520
- O/D survey
- O/D survey Preliminary Results
- Community Survey Preliminary Results
- Ozone Status
- Eugene Wasserman Proposal
- Seatrans Proposal
- Aerial Photo of Solution Sets
- Editorial from Anirudh Sahni
- Correspondence from Larry Pursky
- Correspondence from Bellevue, Kirkland, Redmond
- Correspondence from Debbie Treen
- Correspondence from Maggi Fimia and Peggy Gerdes
- Transit Options Overhead
- Transit Vision
- Public Workshops Update
- Rail Concepts

MEETING ATTENDEES

Members

Dick Adams	T.R.U.S.T.
Jean Amick	Seattle Neighborhoods
Maynard Arsove	No Expansion of 520
Dan Becker	Points Communities
David Cortelyou	Seattle Business
Paul Cowles	North Lake Business
Aubrey Davis	Washington Transportation Commission
Margaret Doman	Eastside Neighborhoods
Bob Edwards	Puget Sound Regional Council
Maggi Fimia	King County
Nona Ganz	City of Kirkland
Peggy Gerdes	North Lake Neighborhoods
Bob Gillespie	Eastside Business
Daryl Grigsby	City of Seattle
Virginia Gunby	1000 Friends of Washington
Tom Heller	Seattle Neighborhoods
Rosemarie Ives	City of Redmond
Ken Jacobsen	Washington Legislature
Anne Knight	Transportation Choices Coalition
Connie Marshall	City of Bellevue
Rob McKenna	King County
Ed Murray	Washington Legislature
John Okamoto	Washington Department of Transportation

- Cheryl Pflug — Washington Legislature
- Doug Pullen — Highway Users Association
- Rick Pusateri — Eastside Business
- Janet Ray — AAA
- Phil Rourke — Point Communities Neighborhoods
- Scott Rutherford — University of Washington
- Cynthia Sullivan — King County
- Dick Taylor — City of Bothell
- Donovan Tracy — Eastside Business
- Jim Tutton — Washington Trucking Association
- Eugene Wasserman — Seattle Business

Alternates

- Susan Baker — Seattle Neighborhoods
- Alan Borning — Transportation Choices Coalition
- Daniel Bray — T.R.U.S.T.
- Richard Conrad — City of Mercer Island
- Maurice Cooper — Seattle Neighborhoods
- Peter Dewey — University of Washington
- Roy Francis — King County
- Chris Johnson — King County
- Kingsley Joneson — Seattle Neighborhoods
- Jim MacIssac — Eastside Transportation Committee
- Connie Niva — Washington Transportation Commission
- Henry Paulman — T.R.U.S.T.
- Dave Russell — Puget Sound Regional Council
- Andrew Schmid — King County
- Noel Schoneman — City of Seattle
- Larry Springer — City of Kirkland
- Ed Switaj — City of Seattle
- Mitch Wasserman — Point Communities Neighborhoods
- Fred Watson — No Expansion of SR 520

Public, Staff, Media

- Nancy Adams — Citizen
- Daniel Bray — T.R.U.S.T.
- Paul Demitriades — City of Medina
- Pat Dorrateague
- Gil Eade — Wetherall Nature Preserve
- Johannes Kurz — Snomomish County
- Ashley Probart — Legislative Transportation Commission Staff
- Les Shafer — King County Department of Transportation
- Betty Spleth — Kirkland Chamber of Commerce

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
MOUNTAINEERS BUILDING
JUNE 16, 1999—1:00 P.M. TO 5:00 P.M.

INTRODUCTION

Pat Serie, EnviroIssues, welcomed the attendees to the Study Committee meeting and reviewed the agenda. She stated that the meeting would focus on discussion of remaining issues and create a framework for the committee's recommendations. She mentioned that several members had expressed interest in touring some of the affected neighborhoods to get understand what might happen under certain options.

PUBLIC COMMENT

Maurice Cooper presented a proposal to the committee for consideration, focused on SR 520. Mr. Cooper drew a cross section of the bridge, and suggested that rail should be considered on SR 520 as well as buses. The solution set with these options predicted a capacity of 16,000 cars per hour. If the ramps were straightened and the vertical alignments changed, the capacity could grow to 21,000. This is an increase of 30 percent capacity. He suggested that a combination of these ideas, rather than paving through Montlake, might work and be publicly acceptable.

Elizabeth Newstrum read from a letter she was submitting for distribution to the Study Committee. She stated that her husband, Len Newstrum, understands the flow problems in the region and currently works at Boeing Labs. She has a masters in English and has worked several years as a configuration manager. They both have experience with the EIS process and contributed successfully to the Yarrow Bay wetlands project. Len has spent considerable time attempting to improve the State Environmental Policy Act. They are concerned with the actions that affect their daily lives. She would appreciate the Study Committee taking the time to read her letter.

Len Newstrum read from a letter he wrote to the Study Committee. He stated that the problem is to find a reasonable method to improve mobility across Lake Washington, not to worry about reliability or affordability. The Legislature did not ask the Committee to focus on all these other issues. He stated that WSDOT has "befuddled" the Study Committee and "provided mind-numbing data." The result has been a small group of actions with slower travel times and higher cost. The degradation of mobility may be slowed, but no plans have been made to handle the traffic during construction. Congestion will shift to I-5 and I-405. Creative ideas were thrown out at an early stage because they were too high technology. Mr. Newstrum stated that WSDOT and Parsons Brinkerhoff were running the show and the biases were obvious. He complimented the committee on doing the best they could under the process and suggested that they inform the Legislature about the restrictions in the process that resulted in solutions not best for the region. They should tell the Legislature that the solution sets contained in the recommendations are not equally weighted.

Dave Petrie, Petrie Transit Consultants, commented that most of the recommendation components are old material with little innovation or forward thinking. There is also a problem with leadership in government to eventually solve the problem. The larger problem in the region is congestion, and there is government support for a different type of design across the SR 520 bridge. The cost of a car-bus-transporter would be comparable to SAFECO field because the infrastructure is already in place. A proposal has been submitted for a 59-mile car-bus-transporter from Lynwood to Tacoma, and it is in the plans for future

construction. He urged the Study Committee to add the option to the study. He feels the option has more of a chance of implementation than light rail or additional HOV lanes.

PROGRESS TOWARD STUDY COMMITTEE RECOMMENDATIONS

Jeff Peacock, Parametrix, stated that the technical team had put together a package summarizing discussions during the last meetings. The ideas expressed by Rob McKenna, Daryl Grigsby, Eugene Wasserman, Jean Amick, Donovan Tracy, Maggi Fimia, and other Study Committee members were incorporated in the package. He commented that the proposal put forward by Rob McKenna contained similar elements to the MTP Flipped solution set, which was previously modeled. The overall carrying capacity of the solution set was 619,000 trips and is a good estimate for the proposal put forward by Mr. McKenna. The modeling work to date has emphasized construction of roadway at grade and widening of the corridor. The opportunities for stacking the facility were examined as well. The right-of-way in the corridor is constrained to 70 to 80 feet wide in certain areas. There are many issues on the east side, where the bridge is already approaching this width. Dick Adams questioned the feasibility of widening the SR 520 corridor due to the impacts on neighborhoods.

Jeff Peacock stated that Eugene Wasserman's table helped to illustrate how similar the solution sets still being considered really are. He presented a chart with four potential solution sets that had received support from the Study Committee during recent meetings. The four proposals included the No Action solution set, SEATRAN's proposal, Rob McKenna's proposal, and 1000 Friends of Washington's proposal. He stated that there were similarities between the ideas. All proposals agreed that transit priority lanes were needed on SR 522, treatment is necessary for non-motorized users, and improvements should be further studied on SR 523 and/or east-west connections with I-5. The majority of proposals advocate considering passenger ferries across Lake Washington, continue to support the possibility of rail on SR 520 in the future, and suggest HOV lanes and pull-outs on SR 520. Similar suggestions were given in the I-90 corridor as well.

The technical team demonstrated connection diagrams a few months ago for the Study Committee. They showed the aerial view of HOV lanes to Kirkland, and the six-lane underground freeway to I-5. Analysis showed that the addition of general purpose lanes to I-5 was not reasonable due to high displacements. Scott Rutherford expressed concern for the committee's ability to reach three reasonable and feasible alternatives. He suggested that the recommendations be for solutions to move forward for further analysis. Jeff reminded the members that the three big issues still remaining for discussion are the new crossing, demand management, and mitigation.

The committee discussed the following issues:

- Has it been determined whether it is feasible to put rail on the SR 520 bridge? It functions more like a boat than a roadway and there could be technical issues. Jeff responded that the engineers were examining the possibilities, but did not feel it was a fatal flaw. Rail does not need to be tied to the bridge, it could be a narrow separate structure.

- Can the Study Committee get technical information on the feasibility of light rail on SR 520? The technical team will talk with Sound Transit and give a more positive statement on the technical feasibility of the project.

- Maynard Arsove commented that there is no room to build to the north of SR 520 because the yacht club is there. The highway right-of-way is to the south of the current corridor, so construction would have to spill 100 feet into the Montlake community. Any addition must be built underground to avoid displacements.

- Restricting commercial vehicles to I-90 was suggested, but would be highly controversial.

- The Roadway/Bus solution set accommodates 712,000 trips, while Rob McKenna's proposal allows 620,000. Where is the discrepancy in numbers? What is the unconstrained "requirement"?

- Keep high capacity transit in the solution set mix.

- How will the connections to I-5 and I-405 be fixed to improve the flow of traffic? What will happen to the Montlake neighborhood?

- Modifications to I-5 would need to be made 2.5 miles from the SR 520 interchange in order to accommodate the new crossing. The changes would add $1 billion to the cost of the project.

- The technical team assessed the possibility of tying HOV lanes on SR 520 to the express lanes. It works well going westbound into the city, but does not work in the opposite direction.

- Concern was expressed that a new crossing would add congestion to I-5. The congestion on SR 520 does not seem to appear because it is transferred to the city streets.

- The Maximize Alternatives solution set should be included in the recommendation because it has the highest carrying capacity and allows people the most freedom and choices.

- Are pedestrians and bicycles included?

- No matter what the outcome of the study, congestion will continue to become worse. There is no way to have free flowing traffic and land use patterns must change in order to address these issues.

TDM Strategies

Jeff Peacock reported good reception for congestion pricing concepts from attendees at public meetings. He summarized other suggestions for recommendations, including interlocal corridor agreements. These agreements could help to identify how to reduce trips. Committee members appear to be in agreement about basic ideas for mitigation, and these concepts should probably be carried forward in the final recommendation and into the EIS process.

The committee discussed the following issues:

- Concern was expressed about paying for the facility. Funds derived from a usage fee, area-wide taxes, and possibly tolls may help the financial aspects of the problem.

- Non-commute trips should be examined.

- 80 percent of trips in the region are non-commuter trips. Strategies must address these issues to protect the corridor.

- Two parts of the PSRC TDM study are complete; transportation pricing strategies should be pursued in that venue and should be regional

- What needs to be done above federal requirements for mitigation? The federal requirements for mitigation will not be as stringent as the community desires.

- Some impacts on wetlands and other natural areas cannot be mitigated.

STUDY COMMITTEE DISCUSSION ON POTENTIAL RECOMMENDATIONS

Pat Serie stated that the committee should attempt to determine the issues where consensus had already been reached. She stressed that the goal of the discussion was not to reach a final decision, but rather to gain a feeling on the direction in which the Study Committee was heading. She asked the committee to discuss the major concepts to carry forward as well as the areas of disagreement.

Donovan Tracy presented a structure he and Eugene Wasserman developed to help the Study Committee reach consensus. He stated that the 20-year planning horizon is too short sighted for the magnitude of the transportation problems facing the region. He placed several of the solution set options into three proposed categories. The outside "book ends" were dropped in the plan because of cost, carrying capacity, and the high controversy with the options. Advanced TDM would be an important element in all the sets, but the timing of advanced TDM is one of the most important questions to consider. He added that the urban centers must be integrated, provide a transit friendly environment, and contain more affordable housing near jobs centers. He stated that small teams from the Study Committee should be created to define the enhancement goals and TDM strategies in detail.

The committee discussed the following issues:

- Connie Marshall recommended that high capacity transit be inserted instead of the term rail.

- It is important to understand the baseline of TDM before incorporating a more stringent effort.

- An option is needed that does not require additional lanes in the SR 520 corridor.

- The SR 520 bridge has a number of problems that could be relieved by metering HOV and transit.

- "No Action" is not a good name for the solution set.

- General purpose lanes cannot be dropped out of the EIS because they would solve a majority of trips in the region.

- I-5 and I-405 must be included in the recommendations.

- There should be a statement of conditions for implementation.

- There will be issues that members have to compromise on and send on to the EIS phase of the project.

- A guiding principle should be protection of the environment.
- Other corridors for improving bus connections should be examined.
- The Kirkland to Sandpoint new crossing should be left in the mix of recommendations carried forward.
- Given the investment in the SR 520 corridor, recommendations should focus on solving the problems there and not look at a third crossing. It would be hard to justify this as an effective use of public money. The model numbers do not support pursuing the Kirkland to Sandpoint crossing.
- 30 percent of the vehicles on the road are freight vehicles. They should move at night.
- All traffic is coming from the north down a narrow corridor.
- High speed rail could be considered in the new crossing.
- Rail separate from the SR 520 corridor would be worth pursuing. High capacity transit should be integrated with the rest of the system.
- Rail between Redmond and the University District could be useful.
- The focus should be long-term and keep all options open.
- Urban growth and TDM must be kept on the list of options.
- Mitigation should be an overarching principle.
- The committee agreed that several groups would be set up to discuss TDM, early actions, and mitigation language for the recommendation.
- A meeting to debate the new crossing informally will be established.

PUBLIC COMMENT

Johannes Kurz , Snohomish County DPW, suggested that the Study Committee concentrate on using a general term to talk about high capacity transit. He stated that using the term "fixed guideway, grade-separated transit" might be useful. It gives the smallest right-of-way and provides the most flexibility in technology. He also stated that recommendations should look at considering compatibility with the science and technology developments.

MEETING HANDOUTS

- Agenda
- Consensus Structure – Donovan Tracy
- Memo – "Stepping Toward Project Recommendations"
- SEATRAN Proposed Build Alternative

- Rob McKenna's Proposal Slides
- Study Committee Member Roster
- Memo – "Land Use and TDM Strategies"

MEETING ATTENDEES

Members

Dick Adams	T.R.U.S.T.
Maynard Arsove	No Expansion of 520
Dan Becker	Points Communities
Richard Conlin	City of Seattle
David Cortelyou	Seattle Business
Paul Cowles	North Lake Business
Margaret Doman	Eastside Neighborhoods
Bob Edwards	Puget Sound Regional Council
Maggi Fimia	King County
Peggy Gerdes	North Lake Neighborhoods
Robert Gillespie	Eastside Business
Daryl Grigsby	City of Seattle
Virginia Gunby	1000 Friends of Washington
Tom Heller	Seattle Neighborhoods
Jim Hill	Eastside Business
Jim Horn	Washington Legislature
Rosemarie Ives	City of Redmond
Ken Jacobsen	Washington Legislature
Doug Jacobson	City of Lake Forest Park
Anne Knight	Transportation Choices Coalition
Connie Marshall	City of Bellevue
Rob McKenna	King County
Ed Murray	Washington Legislature
Phil Noble	Eastside Neighborhoods
John Okamoto	Washington Department of Transportation
Cheryl Pflug	Washington Legislature
Doug Pullen	Highway Users Association
Rick Pusateri	Eastside Business
Janet Ray	AAA
Scott Rutherford	University of Washington
Cynthia Sullivan	King County
Dick Taylor	City of Bothell
Donovan Tracy	Eastside Business
Ward Truess	Eastside Transportation Committee
Jim Tutton	Washington Trucking Association
Eugene Wasserman	Seattle Business
Mark Weed	Seattle Business

Alternates

• Susan Baker	Seattle Neighborhoods
• Alan Borning	Transportation Choices Coalition
• Daniel Bray	T.R.U.S.T.
• Maurice Cooper	Seattle Neighborhoods
• Tracey Eide	Washington Legislature
• Roy Francis	King County
• Chris Johnson	King County
• Kingsley Joneson	Seattle Neighborhoods
• Jim MacIsaac	Eastside Transportation Committee
• Dave Russell	Puget Sound Regional Council
• Doug Schulze	Points Communities
• Noel Schoneman	City of Seattle
• Larry Springer	City of Kirkland
• Ed Switaj	City of Seattle
• Mitch Wasserman	Point Communities Neighborhoods

Seats Not Represented

• Aubrey Davis	Washington Transportation Commission
• Peter Orser	City of Mercer Island

Public, Media, Staff

• Johannes Kurz	Snohomish County DPW
• Elizabeth Newstrum	
• Len Newstrum	
• Dave Petrie	Petrie Transit Consultants
• Rick Thursten	1000 Friends of Washington

MEETING SUMMARY

TRANS-LAKE WASHINGTON STUDY COMMITTEE
BEST WESTERN INN, BELLEVUE
JUNE 30, 1999—1:00 P.M.--5:00 P.M.

INTRODUCTION

Pat Serie, EnviroIssues, welcomed Study Committee members and attendees at the Trans-Lake Washington Study Committee Meeting. She stated that the most important agenda item was to discuss the recommended draft language. The Study Committee would work to understand the issues which need more discussion in order to reach consensus. Pat reminded the committee that July 16th was scheduled as the final meeting and the recommendation would be finalized on that date.

PUBLIC COMMENT

Paul Gibson stated that he lives in the Seattle area and that his last job was on the opposite side of the lake from his home. He has attended several of the public meetings and was impressed with the Study Committee's knowledge of transportation issues. He commented that he is troubled with the word "solutions" because the recommendations from the Study Committee are not necessarily solutions. In his opinion, the word "solution" suggests a large overall fix to the region's traffic problems. He encouraged the committee to concentrate on small improvements instead.

Elizabeth Newstrum referred to Resolution 565 from the Washington Transportation Committee. It states that the goal of the Study Committee is to identify reasonable and feasible solutions that will start the EIS process and guarantee opportunities for the public to influence the outcome. She sees herself and her husband as the worker bees in the process. They don't feel that they have influenced the outcome of the study. In fact, she feels that no one has influenced the outcome of the recommendation after the $3 million spent on the process.

Leonard Newstrum presented a graph showing the maximum mobility for several solution set options. He is concerned that the committee has not looked close enough at maximum mobility. After examining five different solution set options, he stated that an additional two lanes in the SR 520 corridor does not make a difference in the person throughput. He feels that the capacity demand in 2020 has not been studied adequately. An option he presented called "Maximized Mobility" allows for a capacity of 900,000 by his calculations. Mr. Newstrum added that the MTP update process begins soon and that the committee needed to recommend solutions to improve mobility.

Daniel Bray, T.R.U.S.T., is an engineer and a student of rail. He stated that rail on floating bridges will have many technical problems. One issue is the rough environment on the bridge. He doesn't know of a floating bridge that has attempted to carry a rail vehicle. The environment they are exposed to is too severe. Additionally, both I-90 and SR 520 have been damaged by wind and storms, and the concrete and steel members broken. A rail car would be more fragile that the concrete and steel parts of the bridges. It will take lots of money to put shielding up for protection, and no one has faced the nature of the problem yet. Also, the alignment from the pontoons creates additional problems. A system would be needed to adjust for the alignment. He reminded the Study Committee that rail has been voted down twice by people on the Eastside.

Paul Demetriades, City of Medina, congratulated the committee on finishing the study. He asked them to consider two recent occurrences that could impact the study. They could impact the political financing, especially TDM strategies. First a lawsuit on Referendum 49 was presented on June 17 in court. A

decision is expected before the end of the year. Also, Initiative 695 recommends a $30 license tab tax and was able to gather 450,000 signatures. The targeted number was only 180,000. The initiative will be on the November ballot.

John Behnke, Seattle Arboretum, explained that the Arboretum contains 230 acres of land for conservation, education, and recreation. It is the largest garden north of San Francisco, and has many plants from around the world, including endangered species. Five years ago the foundation commenced a study on a plan designed to take the park into the next century. The study showed that 18,000 cars travel on Lake Washington Boulevard, a road that was designed for 4,000. He believes that the Trans-Lake study can improve access to SR 520 and help to protect the Arboretum and the air quality of the region. The ramps around the area have a negative impact and the non-stop traffic accessing SR 520 continues to impact the health of plant collections. The community enhancement and mitigation measures must be examined by the Study Committee in regards to the Arboretum area.

Jean Berry, Mayor of Yarrow Point, presented a city resolution. She thanked the Study Committee for their hard work in the process and for addressing important transportation issues for the region.

Cornelius Peck, University of Washington, stated that TDM strategies will not be permitted on SR 520 because of an agreement made with the federal government. It says that no tolls shall be charged on the bridge after construction costs are recovered through bonds. SR 520 was to be maintained as a free bridge. In 1991, a provision stated that the agreement will remain in effect unless the federal government decides to overrule the decision. It seems clear that no tolls will be allowed on the bridge in the future. He doesn't want to see the Study Committee's plan caught in litigation. Finally, he stated that SOV commuting can never work and that the committee should not facilitate additional SOV capacity for the future.

Philip Grega applauded the recent discussion groups addressing some of the key issues in the draft recommendations. He commented that a north corridor in the lake would meet some of the travel demands and provide a link to the north end of the lake. He suggested that 95th Avenue East would be a sensible corridor, although he clarified that he is not a proponent of another corridor.

DISCUSSION OF DRAFT RECOMMENDATION LANGUAGE

Pat Serie stated that the Study Committee would review the proposed draft language circulated prior to the meeting and examine the substance of the recommendation. Staff attempted to capture the proposal put forward by Eugene Wasserman and Donavon Tracy at the last meeting, the recent group discussions, and comments received from members. She suggested that a narrative was an effective format because of the level of detail needed in the recommendation.

Dan Becker expressed concern about how the changes were made. He felt that not all views were represented in the discussion groups. Pat replied that all members were notified of the meetings and that today's discussion was a chance for all members to shape the recommendation.

I-90

The Study Committee discussed changes to the narrative provided by the staff. After several changes were made to the language, general agreement was reached on the recommendation for the I-90 corridor. The following bullets show the issues and concerns raised by members during the discussion.

- Concern about the two-way provision in the recommendation was expressed.

- The option of rail on I-90 must be carried forward.

- Freight mobility must be protected.

- A presentation of the I-90 study was never given, but rail has been adopted by the regional plan and is part of the existing I-90 Memorandum of Agreement (1976). It should be left open for an independent study of rail.

- It is important for the Study Committee to make a strong statement about rail on I-90.

- Two-way HOV should be left in the recommendation.

"A +" Proposal

Tom Heller presented the Seattle Neighborhoods "A+" proposal. An attempt was made to take the early action notions and elaborate on them to create a reasonable solution. The proposal is neighborhood friendly and outlines a minimal footprint for the SR 520 corridor. Tom emphasized that any solution should keep the bridge as narrow as possible. The "A+" proposal calls for maintaining the four lane facility and providing preferential lanes for HOV/transit use. In addition, all ramps on and off of SR 520 should be rationalized. The plan is an embellishment on the "No Action" alternative. Maynard Arsove commented that the additional shoulders would be difficult to accommodate on the floating portion of the bridge. Rob Fellows indicated that a bike path was studied across SR 520, and that a proposed path has been identified.

The following issues were discussed:

- The proposal does not help arterial traffic congestion.

- Is there a regulation that says shoulders can be no narrower than 10 feet? Jeff Peacock replied that a standard facility would have 8-10 foot shoulders outside the lane and 4 foot shoulders on the inside.

- HOV use must be encouraged and better access would be a good incentive.

- Bicycle/pedestrian lanes could be added to the structure and would not require rebuilding the facility.

- The option is not environmentally friendly. Under this plan, the corridor will be expanded into existing wetlands and the Arboretum area.

SR 520

The committee discussed language referring to the SR 520 corridor. After much discussion, Rob McKenna and Ed Murray recommended language that all members agreed to. The issue of recommending general purpose lanes in the corridor was settled by agreeing to the following language.

- "Evaluation of an additional HOV lane in each direction on SR 520.
- Evaluation in addition to the above of
  - high capacity transit (light rail, busway and/or elevated technology), and/or
  - general purpose lanes in each direction."

The following includes issues and concerns raised by the committee members.

- Studies have shown that a transit only lane would be empty.
- All options for general purpose, HOV, and transit lanes should be left in the recommendation and carried forward to the EIS process.
- General purpose lanes must be accommodated.
- Jeff Peacock stated that all the options would be analyzed in the EIS if the Study Committee recommended they go forward. It should be clarified so that it does not appear that the committee recommended all options together, creating a 12 to 13 lane freeway.
- The list should be narrowed down for a better focus in the EIS.
- General purpose must not be recommended by itself.
- Recommendations should not be watered down in order to reach consensus.
- The public wants general purpose lanes to be evaluated in the EIS process.
- All the options should be mixed and matched in the EIS.
- The public is capacity oriented and all options should be put on an equal basis and analyzed.
- Straightening of the corridor should be included in the recommendation. John Okamoto stated that WSDOT examines the best alignment for the corridor given the need to move traffic, safety requirements, and environmental issues.
- The turn in the bridge was put in to avoid the wetlands, so the "squiggle" has a good purpose. Alignment will be examined during the EIS.
- If the pontoons were fixed, standard shoulders would be added to the bridge.
- Improving the access ramps and other access facilities should be included.
- Mitigation recommendations will be included before the SR 520 corridor recommendations.

Kirkland-Sand Point

Pat Serie stated that a group met and talked extensively on the Kirkland-Sand Point new crossing. Several people think it should be included in the recommendation. More people attending the discussion group did not want to include the corridor, but they agreed to look at a corridor in the north end of the lake. The committee discussed the issue at length and decided to take a straw poll to understand where the committee was headed. She asked—"Do we want to consider a 3rd crossing further in the EIS process?" The straw poll indicated that 14 people wished to carry the option forward, and 30 people were against

the option. She commented that the Study Committee would spend more time on the option at the next meeting.

The following issues were discussed:

- Dan Becker stated that the origin/destination study shows that the travel market in this area would support a new corridor.

- Paul Cowles suggested language that triggered the EIS to examine a new corridor if the footprint for the SR 520 corridor was too large. He stated that a third corridor gives more options and new technology could be accommodated.

- The cost of a new facility would be $7-8 billion. There is no way to finance this construction, the connections to I-5 and I-405 would be difficult, and sensitive areas around the lake would be devastated. Adding the option to the recommendation will add a cost of $8-10 million onto the EIS and double the time.

- A new crossing would be easy to toll.

- All time should be spent fixing the problems on existing corridors. The impacts on I-5 and I-405 from additional traffic make the option infeasible.

- SR 520 lies on an earthquake fault line. A new corridor should be studied outside of the fault line.

- Any third corridor should be only high capacity transit.

- The region has an obligation to meet GMA goals and must connect the urban centers. This new corridor does not accomplish that. Emerging land use patterns in the north end of Seattle should be examined.

- The cost of the new corridor alone makes it infeasible.

- The analysis done by the technical team should be attached as an appendix to the EIS so that work is not lost.

- If the committee does not recommend the new crossing, the message to the public is that they chose not to accommodate the predicted level of demand in the region.

WRAP-UP

The committee did not discuss the language on ferries, TDM, SR 522, or early actions. Pat asked all members to review the language and send comments on the wording by Tuesday, July 6. Aubrey Davis suggested that a meeting on early actions be held to refine the language.

Virginia Gunby thanked the Study Committee for the discussion at the meeting. She suggested that the public has been left out of the process recently. She asked that materials be put on the web site as soon as possible and that public comments be incorporated in the recommendation.

MEETING ATTENDEES

Members

• Dick Adams	T.R.U.S.T.
• Jean Amick	Seattle Neighborhoods
• Maynard Arsove	No Expansion of 520
• Dan Becker	Points Communities
• Richard Conlin	City of Seattle
• David Cortelyou	Seattle Business
• Paul Cowles	North Lake Business
• Aubrey Davis	Washington Transportation Commission
• Margaret Doman	Eastside Neighborhoods
• Bob Edwards	Puget Sound Regional Council
• Maggi Fimia	King County
• Peggy Gerdes	North Lake Neighborhoods
• Robert Gillespie	Eastside Business
• Daryl Grigsby	City of Seattle
• Virginia Gunby	1000 Friends of Washington
• Tom Heller	Seattle Neighborhoods
• Jim Hill	Eastside Business
• Jim Horn	Washington Legislature
• Rosemarie Ives	City of Redmond
• Ken Jacobsen	Washington Legislature
• Doug Jacobson	City of Lake Forest Park
• Anne Knight	Transportation Choices Coalition
• Jean Leed	Seattle Neighborhoods
• Connie Marshall	City of Bellevue
• Rob McKenna	King County
• Ed Murray	Washington Legislature
• Phil Noble	Eastside Neighborhoods
• John Okamoto	Washington Department of Transportation
• Peter Orser	City of Mercer Island
• Cheryl Pflug	Washington Legislature
• Doug Pullen	Highway Users Association
• Janet Ray	AAA
• Phillip Rourke	Points Communities Neighborhoods
• Scott Rutherford	University of Washington
• Cynthia Sullivan	King County
• Dick Taylor	City of Bothell
• Donovan Tracy	Eastside Business
• Ward Truess	Eastside Transportation Committee
• Jim Tutton	Washington Trucking Association
• Raleigh Watts	Seattle Neighborhoods
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Alternates

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• Alan Borning	Transportation Choices Coalition
• Daniel Bray	T.R.U.S.T.
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• Dave Russell	Puget Sound Regional Council
• Andrew Schmid	King County
• Noel Schoneman	City of Seattle
• Larry Springer	City of Kirkland
• Ed Switaj	City of Seattle
• Mitch Wasserman	Point Communities Neighborhoods
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Seats Not Represented

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• Eugene Wasserman	Seattle Business

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• Susan Sareilg	Seattle—Strategic Planning Office
• Betty Spieth	Kirkland Chamber
• Rich Thursten	1000 Friends of Washington
• Rich White	Bellevue Chamber

Trans-Lake Washington Study

Appendix B
Bibliography of Technical Products and Major References

PROJECT BIBLIOGRAPHY

The following is a summary listing of the major study products and committee materials produced for the Trans-Lake Washington Study. The documents are listed in alphabetical order. Descriptions of the studies major technical products were also provided in Section 1.3.4. Many of the study documents are available through the Trans-Lake Washington Study web site (www.wsdot.wa.gov/translake); the web site lists the documents by date. The following notes indicate where and how the study documents listed below can be obtained for review:

1. Trans-lake Washington Study Technical Report, Volume 2, Appendices (copies available through the Office of Urban Mobility).

2. Hard copies are available for review on request at the Office of Urban Mobility.

3. Electronic form downloadable from the study web site; paper copies also available through the Office of Urban Mobility.)

- Adopted Committee Ground Rules [3]
- Bus and Passenger Ferry Concepts [1, 3]
- Committee Notebook: A compilation of committee's mail and meeting packages [2]
- Concept Review and Assessment Results/Study Committee Workshop Materials [1]
- Concepts: Consolidation and Descriptions [1, 3]
- Cost Estimations Methods and Findings [1]
- Description of the Proposed Evaluation Measures [3]
- Draft Concepts Screening and Evaluation Approach [3]
- Draft Evaluation Approach and Criteria [3]
- Draft Strategy Feedback [3]
- Draft Transportation Demand Management Strategy [1, 3]
- Environmental Effects of Solution Sets [2]
- Environmental Strategy: Conceptual Methodology Report [3]
- Evergreen Point Bridge Approach [1, 3]
- Final Problem Statement [1]
- Inventory of Existing Conditions Information Technical Report [2]
- Mitigation and Enhancement: Inventing an Approach [3]
- Open House and Public Meeting Notes [1]
- Origin-Destination Survey Results [1, 3]
- Proposed Decision "Road Map" [3]
- Solution "Strategy" Development [3]
- Solution Set Conceptual Engineering Definitions [1, 3]
- Solution Set Draft Descriptions [3]
- Solution Set Evaluation Criteria and Methodology (also included in final report) [3]
- Solution Set Evaluation Results (5/99 Committee materials) [3]
- Solution Set Evaluations: Bottleneck Analysis [1]
- Solution Set Evaluations: Results of Sensitivity Tests [1, 3]

- Study Committee Findings and Recommendations (also included in final report) [3]
- Summary of Findings for Each Solution Set (also included in final report) [3]
- Trans-Lake Tunnel Crossing Concepts [1, 3]
- Trans-Lake Washington Study Framework Document [3]
- Travel Demand Forecasting Methodology and Results [1, 3]

OTHER MAJOR SOURCE DOCUMENTS FOR THE TRANS-LAKE WASHINGTON STUDY

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Appendix C
Abbreviations

ABBREVIATIONS USED

AVO	Average Vehicle Occupancy
BNSF	Burlington Northern Santa Fe
BROTS	Bellevue-Redmond-Overlake Transportation Study
CAA	Clean Air Act (Federal)
CAW	Clean Air Washington Act (State)
CMS	Congestion Management System
CO	Carbon monoxide
Corps	Army Corps of Engineers
CTR	Commute Trip Reduction
DOE	Washington State Department of Ecology, or Ecology
EIS	Environmental Impact Statement
ESA	Endangered Species Act
GIS	Geographic Information System
GMA	Growth Management Act
HOV	High Occupancy Vehicle
ISTEA	Intermodal Surface Transportation Efficiency Act
LUTRAQ	Land Use, Transportation and Air Quality Study (Oregon)
mph	miles per hour
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
MVM	Million Vehicle Miles
NEPA	National Environmental Policy Act
PSRC	Puget Sound Regional Council
SEPA	State Environmental Policy Act
SHSP	State Highway System Plan
SIP	State Implementation Plan
SOV	Single Occupant Vehicle
TDM	Transportation Demand Management
TEA-21	Transportation Equity Act for the 21st Century
TMA	Transportation management associations
TRAC	Washington Transportation Center
TSM	Transportation System Management
UGA	Urban Growth Area
UGB	Urban Growth Boundary
USEPA	United States Environmental Protection Agency
UW	University of Washington
vht	vehicle hours of travel
vmt	vehicle miles of travel
vph	vehicles per hour
WSDOT	Washington State Department of Transportation
WTP	Washington Transportation Plan