Rail Operation Network

As the rail system is deployed, it will undergo several basic changes in its operating configuration. It is expected to start service as a single line operating through the DSTT to a southern terminal near the Boeing Access Road. Extensions will be opened to the north and south, still operating as a single line, but with increased ridership and shorter headways. A branch line to the east, through Bellevue to a Northup station, will introduce a junction between the south line and the east line and a significant increase in complexity of train operations. As the north and south lines are extended, the operations will be modified to include intermediate turn-back locations for trains in order to balance the operations with patronage patterns. Additional junction points will be introduced with the branch to Totem Lake and the potential branch to Paine Field.

If surface light rail alternatives (i.e., systems with at-grade crossings and mixed traffic operation) are adopted to provide service to the Paine Field and Everett areas and/or in Tacoma and Lakewood, the high capacity rail system will need to provide transfers between these complementary rail systems. Station configurations at these rail-to-rail transfer stations would permit across-the-platform transfers between these two services. Routing trains directly from surface LRT routes onto the high capacity lines is not practical for maintaining efficient operation of the rail system as trains from the surface operation cannot maintain schedules closely enough to mesh with trains from other points in the rail system.

Rail Support System

The rail system will require a number of support facilities. These facilities consist of storage yards for the trains, rail vehicle maintenance shops, a central control facility, and track and wayside maintenance shops.

The initial rail system segment needs to have each of these support facilities in order to operate effectively. This segment is projected to be a south line from the DSTT to the Boeing Access station; a combined storage yard and vehicle maintenance shop is planned for this location. The yard and shop at Boeing Access would provide support for the entire rail system until it is extended to NE 145th Street in the north and/or to Northup on the Eastside. As the system expands further, additional yards and shops can be located beyond the

Redmond terminal and at several possible locations along the south line. Initially, the track and wayside maintenance shops would be located at the Boeing Access yard and shop site. As the system grows, additional locations will be needed to better serve each of the system's branches.

In addition to the storage yards, the end of each rail line needs to provide storage space for a minimum of four trains and a double cross-over. These end-of-line facilities are necessary to provide the ability to turn trains back at the end of the line and to provide limited train storage to facilitate adding trains at the beginning of the peak periods.

The central control facility is the location from which the operation (both normal and emergency) of the rail system is controlled. Communications, operational data and the command and control functions are located in central control. This facility does not have to be physically located on or near to the rail system; however, its location is currently assumed to be in the maintenance shop building at the Boeing Access yard.

Operation and Maintenance Costs

Operation and Maintenance Costs for the rail system have only been estimated for the full Rail/TSM Alternative for the year 2020. O&M cost estimates, as annual cash flows, for the rail deployment will be prepared as part of the next phase of the Project Planning effort. Annual O&M costs will vary increasing as the rail system expands. The increase in costs will be due to operating trains over longer routes and increasing the frequency of trains as more people ride the rail system.

7.1.3.3 Ridership and Economics

Several criteria can be used to assess the investment returns of individual RTP construction phases as well as to evaluate different RTP phasing scenarios given the appropriate travel demand forecasts. For example, the capital cost per route-mile might be used to assess which phase provides the most service area per dollar. Similarly, the capital cost per passenger (as measured by dividing an investment's capital cost by the projected ridership for that investment's first year of revenue service) is a practical criterion for assessing the ridership investment return of a particular phase or alternative. In addition, the farebox recovery ratio is sometimes used to compare different phases

of an alternative or different alternatives for their relative efficiency in terms of the proportion of operating costs covered by the fare-paying ridership.

Within the bounds of a particular alternative, these criteria are important for identifying the construction segment to be given initial priority as well as in ranking and selecting future project investments following the implementation of the initial phase or "starter" system. To the extent that ridership projections change over time and different phasing scenarios within a particular alternative allocate different segments to each construction phase, criteria such as the capital cost per passenger help identify the phasing scenario that provides the highest ridership return on investment. Capital cost per passenger can also be used to compare the relative returns of different alternatives, given their phasing assumptions.

The following information and analysis pertains to the preferred phasing scenario of the Regional Transit Project (Rail Alternative excluding Commuter Rail and TSM components). **Table 7.3** displays the characteristics of the preferred phasing scenario in terms of what each construction phase and its associated capital costs adds to the overall system.

Figure 7-17 illustrates shares of service area facilities and capital costs allocated to each phase of the preferred RTP phasing scenario. The initial system or Phase I requires the greatest capital cost and also provides the largest number of rail stations and the greatest system mileage of any of the four phases. Capital costs per mile or per station are relatively constant between phases; a dollar invested in Phase II would buy about the same proportion of route mileage or station facilities as it would in Phase IV, although there are a few capital costs associated with the initial phase that would not be incurred in subsequent phases.

The relatively constant relationship between capital costs and service area facilities does not hold true for ridership returns. **Figure 7-18** illustrates the ridership returns of each phase of the preferred RTP phasing scenario. In this case, capital costs for the first phase, which account for 45 percent of the total 2020 system cost in 1991 dollars, attract a disproportionate 84 percent of the 2020 ridership. Furthermore, the subsequent phases attract diminishing shares of the remaining ridership demand, as shown in **Figure 7-18**. In terms of capital cost per passenger (based on the ridership for the first year of

TABLE 7.3

PREFERRED PHASING SCENARIO CHARACTERISTICS

	Capital Cost 1991 Dollars (in Millions)		Miles of System	Number of Stations	Annual Riders (in Millions)	Percentage of 2020 Ridership	Capital Cost per Passenger
Phase I: Revenue Service by 2005	3,523	(1)	38	24	132.7	84%	26.55
Phase II: Revenue Service by 2010	1,130		21	14	12.4	8%	91.13
SUBTOTAL	**4,653**		**59**	**38**	**145.1**	**92%**	**32.07**
Phase III: Revenue Service by 2015	1,367	(2)	28	13	9.2	6%	148.59
SUBTOTAL	**6,020**		**87**	**51**	**154.3**	**98%**	**39.01**
Phase IV: Revenue Service after 2015	1,723		37	18	3.0	2%	574.33
TOTAL	**7,743**	(1)	**124**	**69**	**157.3**	**100%**	**49.22**

(1) Excludes Commuter Rail and TSM Components
(2) Capital cost reduced from original estimate by $ to achieve better equity

8/27/92

Local-express service would combine collector and line-haul functions into one operation. Local-express routes would pick up and drop off passengers in neighborhoods, serve local park-and-ride lots or transit centers, and proceed to the nearest transitway access point. The express portion of local-express routes would connect to regional activity centers or major activity centers by way of the transitway network.

Feeder bus service would also be provided to stations and park-and-ride lots. The feeder routes would function as collectors. Feeder route passengers would transfer to express routes or the express portions of local/express routes.

The network of background transit services in each corridor is comprised of local and express routes which do not operate on the transitway. Background transit service would consist of the TSM baseline transit service modified to eliminate service duplication and improve travel time and reliability. Some of the TSM baseline routes would be re-routed onto the transitways or converted to provide feeder bus service to the transitway system.

4.4.3.2 Service Hours and Frequency

Transit service under the Transitway/TSM Alternative would be consistent with the transit service hours and frequency described in the TSM Alternative. However, because transit speeds would be increased by the capital improvements for the alternative, platform miles would be somewhat greater than for the TSM Alternative.

4.4.4 Operating and Maintenance Costs

Operating and maintenance costs for the Transitway/TSM Alternative would be about $406 million (1991 dollars) as tabulated in **Table 4.2**.

4.4.5 Fleet Size and Composition

Fleet sizes were developed based on peak-hour service needs and necessary spares. This alternative would have a fleet size similar to the TSM Alternative as listed in **Table 4.2**. The Transitway/TSM Alternative requires expansion of Metro's dual-power fleet to 561 buses by 2020. The remainder of the fleet would consist of 1,368 internal-combustion-engine buses (powered by an alternative fuel), 220 trolley buses, and five streetcars operating on the waterfront

streetcar route. By 2020, all the dual-power buses in Metro's fleet would also use an alternative fuel or clean diesel.

Community Transit would expand to a fleet of 418 buses, Everett Transit to a fleet of 82 conventional buses, and Pierce Transit to a fleet of 220 buses. These figures reflect only the fleets that would be required to implement the regional service that was included in the patronage modeling. Additional buses would be required for these transit agencies to implement increases in local service. As with Metro, increasingly strict air quality regulations would probably result in these buses being fueled by alternative fuels or clean diesel.

In addition to the regular fleets, approximately 370 ADA shuttle vans would operate in King County, 152 in Pierce County, and 157 in Snohomish County. Transit operators would provide 1,713 vanpool vans in King County, 704 in Pierce County, and 725 in Snohomish County.

4.5 Rail/TSM Alternative

4.5.1 Rail Technology

This alternative would be based primarily on an electric rail system operating on an exclusive, grade-separated right-of-way. For purposes of evaluation, it is assumed that this rail system would operate with steel wheels on steel rails and would draw power for its electric propulsion system from an overhead catenary system. Except for a commuter rail line, the rail vehicles would be propelled by conventional rotary electric motors. The appropriate rail vehicle and technology would be selected during the project-level environmental review or Preliminary Engineering phases of project implementation.

In addition to the electric rail system, the rail system would include conventional commuter rail service using approximately 40 miles of existing railroad right-of-way through the Green River valley between Tacoma and downtown Seattle. However, unless otherwise indicated, "rail" in this document refers to the electric rail system and not to commuter rail.

4.5.2 Capital Facilities

The following description portrays the Rail/TSM Alternative in terms of the general areas and activity nodes served, and the general pattern of a feeder bus service. Although the description refers to specific potential rights-of-way and facility locations, the actual evaluation of specific alignments and facilities would occur subsequent to adoption of the System Plan. If the Rail/TSM Alternative is selected, specific alignments and facilities would be subject to project-level environmental review. The alignments and facility locations described here as part of this alternative are illustrative of the alternative for purposes of system evaluation. They are not precise or preferred alignments or facility locations. The markets to be served by the alignments are part of the decisions to be made for the System Plan and the general configuration of the RTP rail corridors to serve these markets is shown in **Figure 4-10**.

For illustration purposes only, typical rail stations are shown in **Figure 4-11**. The baseline alignments used for modeling are shown in **Figure 4-12**. These facilities would be overlaid on a reduced set of TSM measures and a park-and-ride system with capacity greater than that of the TSM Alternative.

In addition to corridor-specific facilities described below, the Rail/TSM Alternative would require development of rail car maintenance and storage facilities. The system would probably incorporate a 53-acre primary maintenance and storage facility in the South Corridor, as well as outlying light maintenance and storage facilities in each of the three principal corridors.

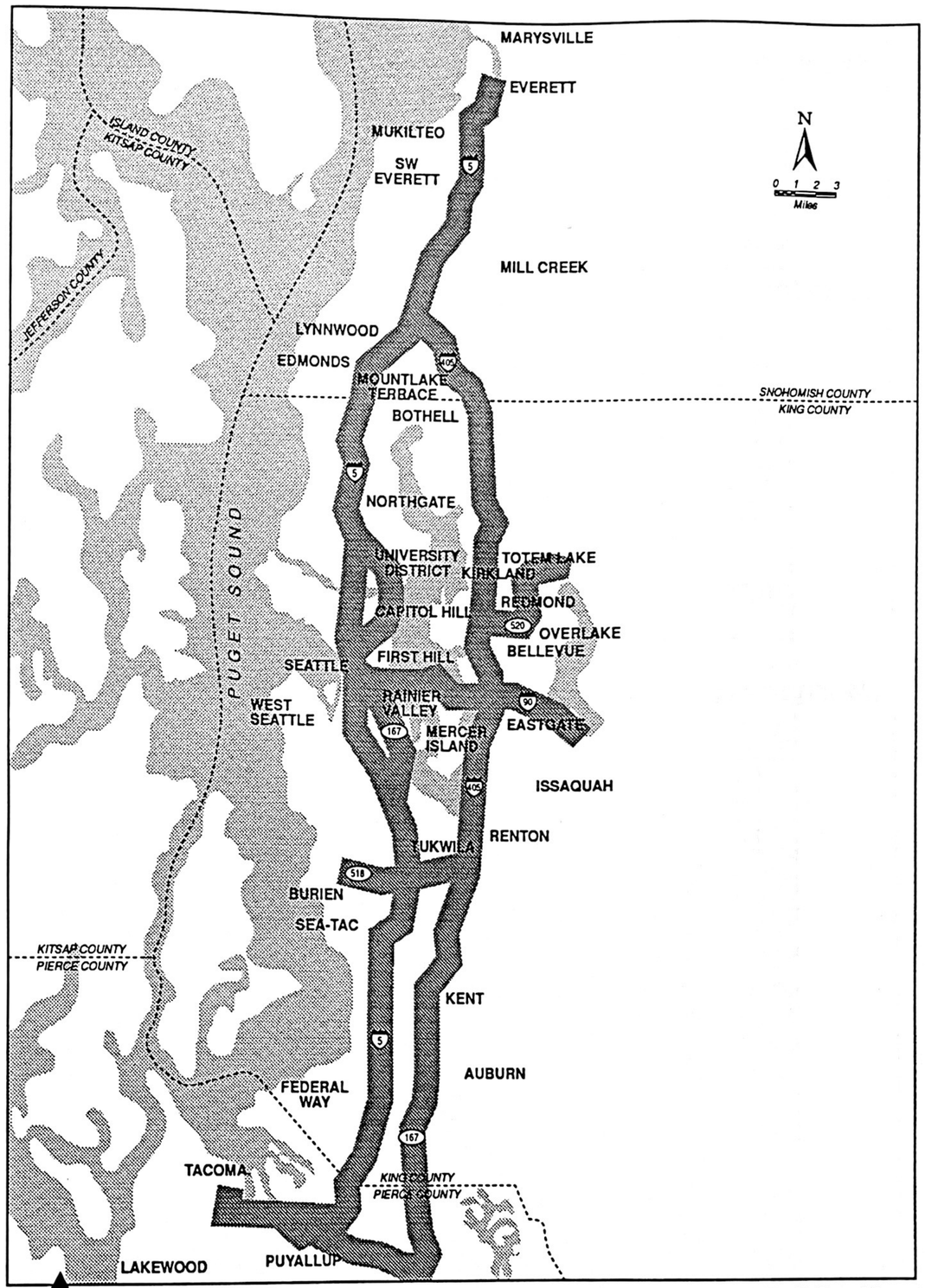
4.5.3 Cost of Rail/TSM Facilities

The Rail/TSM Alternative would cost approximately $10.2 billion more than the No-Build Alternative as listed in **Table 4.3**.

4.5.4 Descriptions of Rail Corridor Alignments

4.5.4.1 North Corridor

Alignment Description. The rail alignment within the North Corridor would extend from the DSTT to Everett. Activity centers served could include Downtown Seattle, First Hill, Capitol Hill, the University District, Northgate, Lynnwood, Southwest Everett/Paine Field and Everett CBD.



Regional Transit Project
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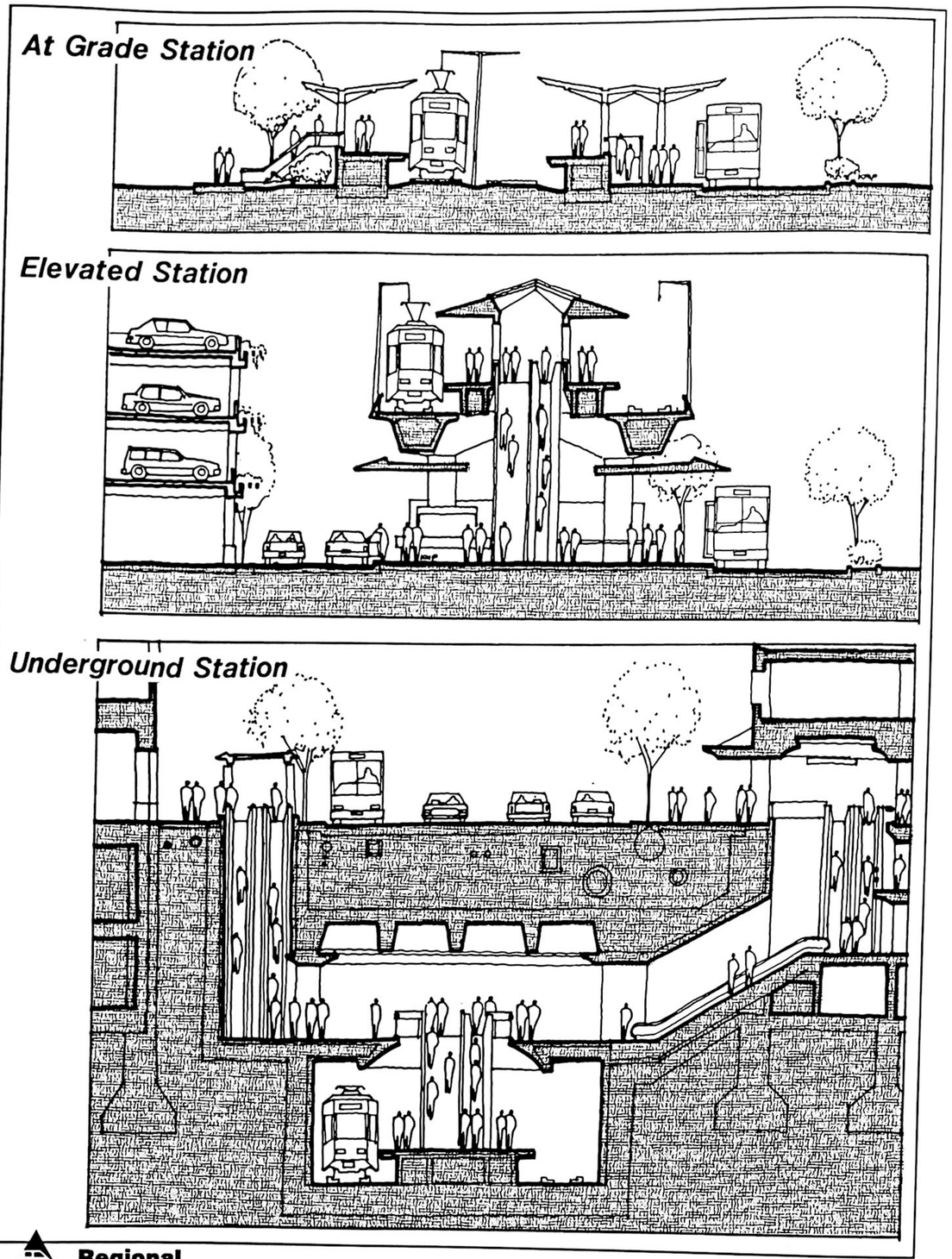
RT PF 0204A

2020 Rail Corridors
System Plan
FIGURE 4–10



Typical Rail Stations
System Plan
FIGURE 4–11

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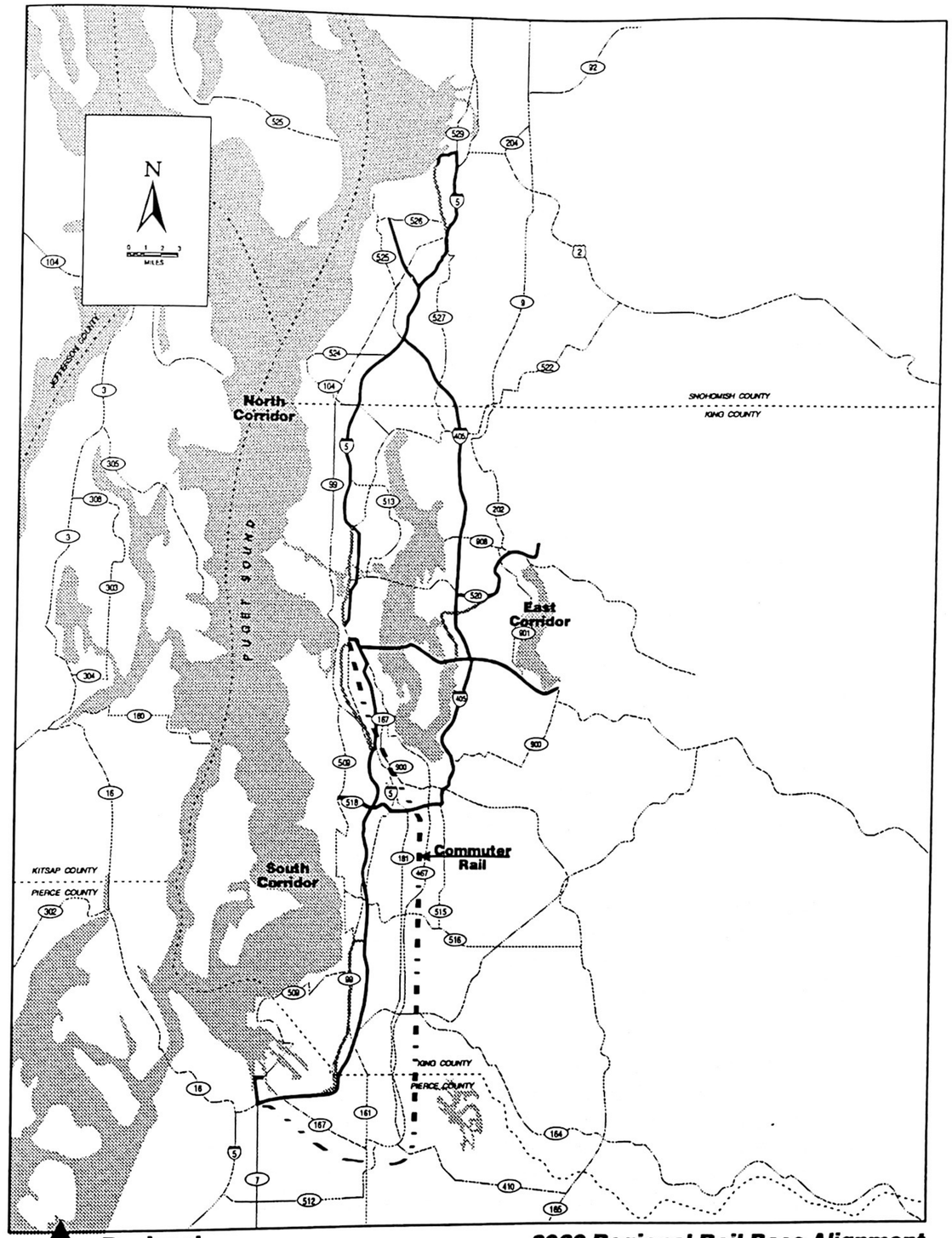

2020 Regional Rail Base Alignment
System Plan
FIGURE 4–12

Regional Transit Project
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Regrail2

The baseline alignment in the North Corridor generally parallels I-5 from the Seattle CBD to downtown Everett with a spur to Paine Field in Southwest Everett. Starting at the Convention Place Station on the DSTT, the line would pass under I-5 to First Hill, then to Capitol Hill along Broadway. From the Capitol Hill the line would proceed north crossing under Portage Bay through the University and Roosevelt Districts to Northgate. North of Northgate the line would parallel I-5 through the northern part of Seattle, the Shoreline area of north King County and into Snohomish County, serving Mountlake Terrace and Lynnwood. North of the I-5/I-405 interchange a branch line would extend north and west to Paine Field, while the mainline would continue north parallel to I-5 serving the Mill Creek area, the Everett Mall area, and eventually terminating in the Everett CBD.

The JRPC and Metro's Planning Subcommittee have designated the portion of the alignment between the DSTT and Northgate as the preferred alignment in the North Corridor.

In addition to this baseline alignment a large number of options exist for various portions of the alignment, particularly between Northgate and/or NE 145th Street and the Everett CBD. The most significant deviations from the baseline alignment include alignments along portions of SR 99 in both King and Snohomish Counties and alternative connections between the Lynwood CBD, Paine Field and the Everett CBD.

Stations/Access Points. Potential station locations for the baseline alignment include:

- First Hill
- Capitol Hill (one to two stations)
- University District (two stations)
- NE 65th Street
- Northgate
- NE 145th Street
- NE 175th Street
- Mountlake Terrace (one or two stations)
- Lynnwood (two stations)
- 164th Street SW
- 128th Street SW
- Everett Mall

- Broadway and 35th Street SE
- Downtown Everett (2 stations)

Station locations on the Paine Field extension of the baseline alignment include Paine Field and SR 99.

Maintenance Facilities. Interim maintenance facilities for the North Corridor would probably be located in the industrial area south of downtown Seattle. With completion of the line north into Snohomish County, permanent maintenance and storage facilities for this corridor could be located on a number of possible sites between 164th Street SW and downtown Everett.

4.5.4.2 South Corridor

Alignment Description. One rail alignment within the South Corridor would extend from the Seattle CBD through Federal Way to Tacoma. An interconnecting east-west rail segment would extend from Burien east around the south end of Lake Washington to the May Creek area, where it would connect with the southern extension of the East Corridor. A commuter rail line would extend from downtown Seattle to Tacoma through the Green River Valley.

Two general South Corridor alignment options are under consideration between downtown Seattle and the south end of Boeing Field. Both of these pass through the Rainier Valley and end at the Boeing Access Road. These two alignment options are discussed below. From Boeing Access Road the alignment would continue south along SR 99 to the vicinity of SR 518, where it would continue to directly serve the Seattle Tacoma International Airport. The alignment would continue under relocated 28th Avenue South, serving the City of SeaTac. From there it would follow the proposed extension of SR 509 and connect with I-5 in the vicinity of South 216th Street. It would then follow the I-5/SR 99 corridor through Federal Way south to Tacoma.

Rainier Valley Alignments. The Rainier Valley alignments would proceed east in the I-90/Dearborn corridor to Rainier Avenue South and south on Rainier Avenue to South McClellan Street. The rail line would then continue using either Rainier Avenue South or Martin Luther King, Jr. Way to the vicinity of South Henderson Street, then west to the south end of Boeing Field, where it would connect to the common South Corridor alignment. The JRPC and Metro's Planning

Subcommittee have designated this alignment as the Preferred Alignment in the South Corridor.

Commuter Rail Element. The rail system would also include a commuter rail line which is shown in **Figure 4-12**. Commuter rail typically consists of conventional rail cars pulled by a locomotive, generally operating only, or with greater frequency, in the direction of commuter travel. The proposed service would operate from Tacoma to the King Street Station in downtown Seattle along the Burlington Northern or Union Pacific Railroad tracks. Service would begin by 1997. The commuter rail line could connect with the rest of the rail system at Tacoma, Longacres, Boeing Access Road, and the International District/King Street Station. Section 4.6 provides a more definitive description of this program element.

Stations/Access Points. Stations would be provided at locations along the rail line to provide access to/from employment centers, neighborhoods, park-and-ride lots, and other transit lines. Potential station locations in the Rainier Valley include:

- Rainier Avenue at I-90
- South McClellan Street
- South Genesee Street
- South Graham Street, and
- South Henderson Street.

Other potential station locations include:

- Boeing Access Road and East Marginal Way South
- SR 99/SR 518 interchange
- Sea-Tac Airport
- SeaTac Town Center
- Kent-Des Moines Road
- Star Lake
- Federal Way
- South Federal Way
- SR 167/I-5 (Fife)
- Vicinity of the Tacoma Dome, and
- Downtown Tacoma.

Potential stations along the east-west alignment south of Lake Washington include:

- Burien
- SR 99
- Boeing Longacres site
- South Renton
- Renton Boeing plant, and
- Kennydale.

Potential commuter rail stations include:

- Spokane Street
- Georgetown
- Boeing Access Road (Oxbow)
- Longacres
- Downtown Kent
- Downtown Auburn
- Puyallup/Sumner
- Tacoma Dome/Amtrak Station

Maintenance Facilities. Maintenance facilities for the RTP South Corridor alignment would be located near Boeing Access Road. Maintenance facilities for the Burien line could be located north of SR 518 near SR 99. Maintenance facilities for the commuter rail line could be located in Auburn or Tacoma, with an additional layover yard south of downtown Seattle.

4.5.4.3 East Corridor

Alignment Description. The East Corridor alignment would extend from the International District Station of the DSTT to downtown Bellevue by way of I-90 and I-405. From downtown Bellevue the line would branch northeast to Redmond and north along I-405 to I-5 in Snohomish County. The I-90 alignment would be extended to Issaquah. The I-405 segment would be extended south to Renton along Burlington Northern right-of-way tracks where it would connect to the Burien line.

Station/Access Points. Potential station locations currently under consideration include:

- I-90 at Rainier Avenue South;
- Mercer Island;
- I-90 and I-405;
- South Bellevue park-and-ride or Wilburton park-and-ride lot;
- Downtown Bellevue;
- Six locations along I-405 including the Houghton park-and-ride lot, NE 85th Street, Totem Lake, NE 160th Street between Kirkland and Bothell, east Bothell, and the Canyon Park area near the intersection of I-405 and SR 527, and Damson Road; and
- Seven locations between Bellevue and Redmond, including Northup/124th Avenue NE, the Overlake area, the Evergreen Highlands area, NE 51st Street at SR 520, downtown Redmond, and in Southeast Redmond.

Additional stations could be located at the Eastgate park-and-ride lot and in Issaquah. South of Bellevue, potential stations could be located at the Newport Hills park-and-ride lot and in the May Creek area.

Maintenance Facilities. Interim maintenance facilities for the East Corridor could be located in Bellevue east of I-405 in the vicinity of Metro's current Bellevue base. Permanent maintenance facilities would be located in Southeast Redmond.

4.5.5 Rail Service Plan

The following service plan is an example of how the rail system could operate, along with supporting bus services. The plan is preliminary and subject to change during subsequent environmental review.

4.5.5.1 Operating Concept

Rail service would be operated along five-through routes as follows:

- Line 1-Everett to Seattle, then east to Issaquah;
- Line 2-Redmond through Bellevue and downtown Seattle, then north to Everett;

- Line 3-Tacoma to downtown Seattle, continuing north to Northgate;
- Line 4-Paine Field in Snohomish County along the Airport Road/I-405/SR 518 corridor through Bothell, Bellevue, and Renton to Burien; and
- Line 5-Northgate to Seattle, continuing south to Federal Way.

Transfer points between the lines would be at 164th Street in Lynnwood, downtown Seattle, downtown Bellevue, the I-405/I-90 interchange, and the SR 99/SR 518 interchange and I-90/Rainier (if the preferred Rainier Valley alignment is selected).

The rail system would rely on a network of feeder bus routes, transit centers, and park-and-ride lots which would be linked and/or integrated with rail system stations similar to those under the Transitway/TSM Alternative.

4.5.5.2 Service Hours and Frequency

The rail system would operate from 5 a.m. to 1 a.m., seven days a week. By 2020, frequencies would range from every two minutes to every thirty minutes, as shown in **Table 4.5**. Peak service would be provided from 6 a.m. to 8:30 a.m. and 4 p.m. to 6:30 p.m. on weekdays. Base service would be provided from 8:30 a.m. to 4 p.m. and 6:30 p.m. to 10 p.m. weekdays and 6 a.m. to 10 p.m. weekends and holidays. Owl service would be provided from 5 a.m. to 6 a.m. and 10 p.m. to 1 a.m. Four-car trains would be used at peak periods and two-car trains at other times.

By 2020, commuter trains could operate every 15 minutes during peak hours and as demand warranted during the middle of the day, and could offer evening, weekend and special event service.

4.5.6 Rail/Bus Service

The background bus system for the Rail/TSM Alternative would consist of a feeder bus and a local bus system. The feeder bus system would be a network of routes serving rail stations. The local bus system would be a network of local and express routes which do not specifically feed the stations. Routes in the TSM Alternative network in proximity to rail stations would probably be re-routed to serve the

TABLE 4.5

PEAK HOUR FREQUENCIES OF RAIL OPERATIONS (2020)
(Frequency in Minutes)

Segment	Line(s)	Peak	Base	Owl
Everett CBD to Northgate	1, 2	5	8	10
Northgate to Seattle CBD	1, 2, 3, 5	2	3	7
Seattle CBD to Federal Way	3, 5	3	4	10
Federal Way to Tacoma	3	10	15	20
Seattle CBD to I–405/I90	1,2	5	8	10
Bellevue CBD to I–405/I–90	2, 4	6	9	10
Bellevue CBD to Redmond CBD	2	12	18	20
Issaquah CBD to I–405/I–90	1	12	18	20
Paine Field to Bellevue CBD	4	15	22	20
Burien CBD to I–405/I–90	4	15	22	20
Seattle to Tacoma (Commuter Rail)		15		

rail stations. Routes in the TSM network which competed with rail service would probably be truncated or deleted entirely. New routes would be proposed, as appropriate, to provide access to rail stations from areas left unserved by other modifications to the TSM bus network.

4.5.6.1 North Corridor

All stations would be served by one or more feeder routes. The University District and Northgate stations would have the greatest number of feeder bus routes. In addition to routes from the North Corridor, the University District stations would have feeder bus service from the East and South corridors. Although passengers arriving from other corridors would be destined primarily for the University District, they would also be able to transfer to the rail system at that point. In addition to the TSM service proposed for Snohomish County, Everett Transit also proposes nine new local circulator routes to provide access to rail stations from areas not served by the TSM network.

The Metro local bus system would provide service from areas west of I-5 to downtown Seattle. Metro would provide local bus service between First Hill and North Seattle and paratransit services to Kenmore and Bothell. Community Transit would provide service between Mukilteo and Everett Boeing.

4.5.6.2 South Corridor

Metro feeder routes would provide access to rail stations from communities in south King County, as well as from areas in the Rainier Valley, West Seattle, and south Seattle. Pierce Transit would provide access to the rail line from Tacoma and other areas throughout Pierce County. Metro routes which would serve stations along the Burien-Renton alignment would consist of local feeder routes from Burien, West Seattle, Southcenter, and Renton. In addition to routes proposed under the TSM Alternative, Pierce Transit would provide new routes connecting Bonney Lake, Lakewood, Olympia, and Fort Lewis to rail stations in Tacoma and Fife.

The local bus system would provide express service between downtown Seattle and White Center, Harbor Island, Beacon Hill, and Vashon Island, as well as local service within and between communities in the South Corridor.

4.5.6.3 East Corridor

Metro feeder bus service would operate to all rail stations from the areas in the East Corridor served by the TSM Alternative. In addition, a new route would operate from Totem Lake and Kirkland to the University District, stopping to feed stations at Totem Lake, NE 85th, and NE 70th. Stations along the I-405/Paine Field line would be served by routes operated by Metro, Community Transit, and Everett Transit. Express service from Snohomish County to Redmond would continue to be provided by express bus routes operating on I-405. Local regular bus service would be provided, similar to the TSM Alternative, where local routes were not truncated by the rail system. Metro would also provide express bus service to downtown Seattle from Kirkland.

4.5.7 Operating and Maintenance Costs

Total operating and maintenance costs for the Rail/TSM Alternative would be about $492 million (1991 dollars) annually in the year 2020, as listed in **Table 4.1**.

4.5.8 Fleet Size and Composition

Fleet sizes were developed based on peak-hour service needs and necessary spares. As shown in **Table 4.6**, the 2020 rail system would require almost 400 rail transit cars, as well as 80 conventional commuter rail cars and 10 locomotives for the commuter rail line.

The Metro bus fleet would consist of 1,573 internal combustion engine buses powered by an alternative fuel or clean diesel, 233 trolley buses, and five streetcars on the waterfront route.

Community Transit would expand to a fleet of 286 buses, and Everett Transit to a fleet of 82 conventional buses Pierce Transit's fleet would actually decline to 172 buses. These fleet figures represent only the vehicles required to implement the regional service plan used for patronage modeling; additional fleet would be required to increase local service in Pierce and Snohomish Counties. As with Metro, new strict air quality regulations would result in these buses being fueled by alternative fuels or clean diesel.

TABLE 4.6

2020 RAIL/TSM ALTERNATIVE FLEET COMPOSITION

Operator	Vehicle Type	Number of Vehicles in Model *
RTP	Rail Transit Cars	396
	Commuter Rail Cars	80
	Commuter Rail Locomotives	10
Metro	Standard Buses	1,163
	Articulated Buses (60')	410
	Standard Trolleys (40')	164
	Articulated Trolleys	69
	Streetcars	5
Community Transit	Standard Buses	174
	Articulated Buses (60')	112
Everett Transit	Standard Buses	82
Pierce Transit	Standard Buses	172
	Total Vehicles	**2,837**

*Represents only vehicle needs for regional service as modeled for ridership calculations. CT, ET, and PT would have additional buses as needed for local service.

Approximately 370 ADA shuttle vans would operate in King County, 152 in Pierce County, and 157 in Snohomish County. Transit operators would provide 1,713 vanpool vans in King County, 704 vanpool vans in Pierce County, and 725 vanpool vans in Snohomish County.

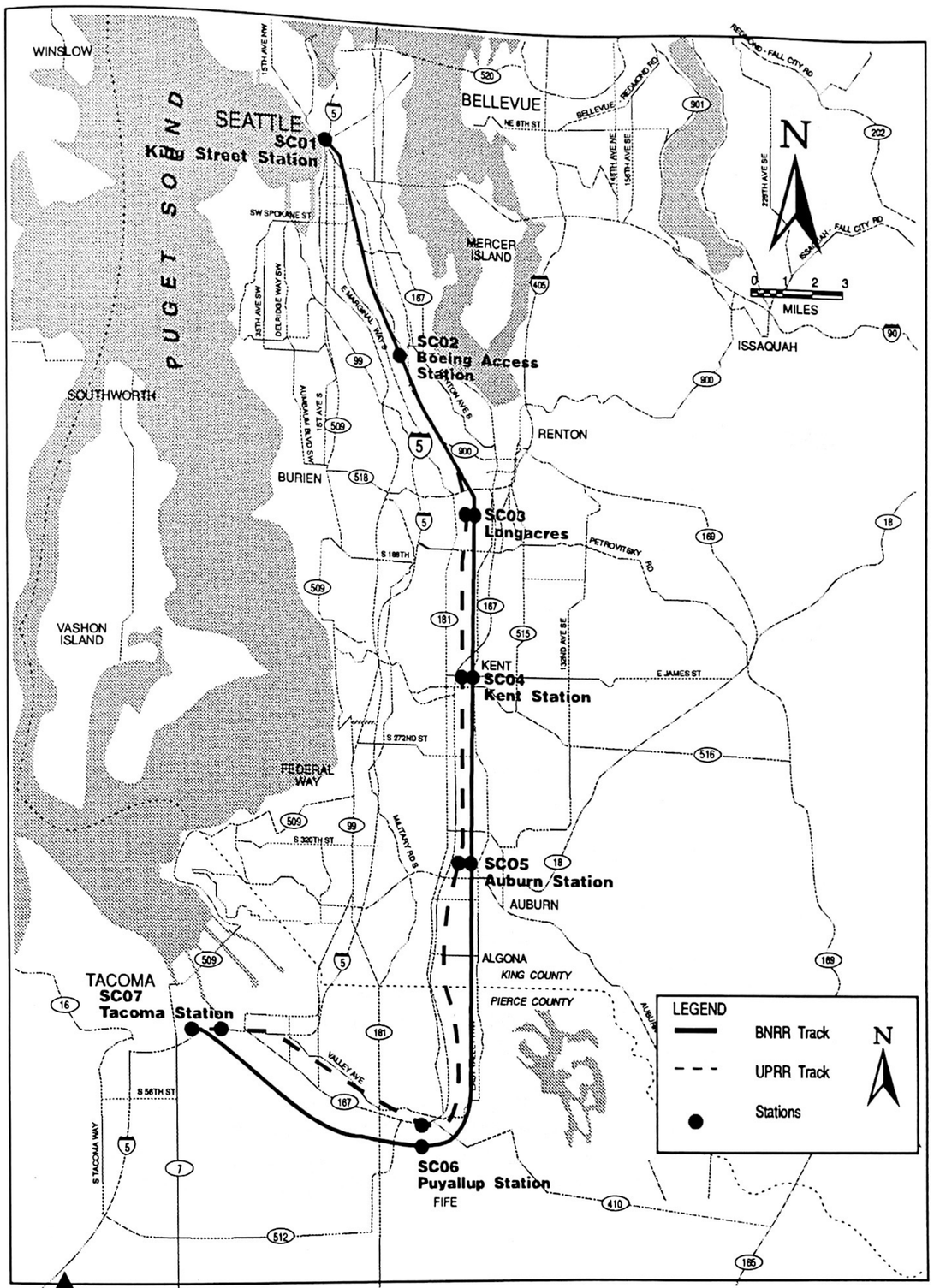
4.5.9 South Corridor Commuter Rail

The South Corridor Commuter Rail element of the Rail/TSM Alternative is documented in the *South Corridor Commuter Rail Service Alternatives Report,* PB/KE Team, August 1992, PB/KE Team, August 1992. This element of the RTP envisions bidirectional passenger service using approximately 40 miles of existing Burlington Northern or Union Pacific railroad main line between downtown Seattle and Tacoma as shown in **Figure 4-13**.

Stations would be strategically located to serve the major communities on the existing railroad main lines - including the Seattle CBD, the Boeing/ Duwamish industrial area, the Tukwila/Longacres area, Kent, Auburn, Puyallup and Tacoma. Other locations have been suggested and may be included as a consequence of more detailed analysis. Various capital improvements would be required to support pedestrian, bicycle, and vehicular access to each of these stations. In addition, various types of physical and institutional improvements to the existing infrastructure and operations would be required in order to provide commuter rail service in a cost-effective manner. Locomotives and passenger coaches will have to be leased or purchased, as well.

At the system plan level of analysis, the use of conventional diesel locomotives and bi-level, locomotive-hauled commuter coaches equipped for push-pull service have been assumed for initial south corridor commuter rail start-up service. Further, more detailed project level studies may result in decisions to pursue variants on this technology.

A preliminary 2020 estimate of operating costs for any south corridor commuter rail service alternative is approximately $10 million annually, based on a two-person crew and 32 trains per day.



South Corridor Commuter Rail Alternative Alignments
System Plan
FIGURE 4–13

4.6 Potential Supplements to the Rail/TSM Alternative

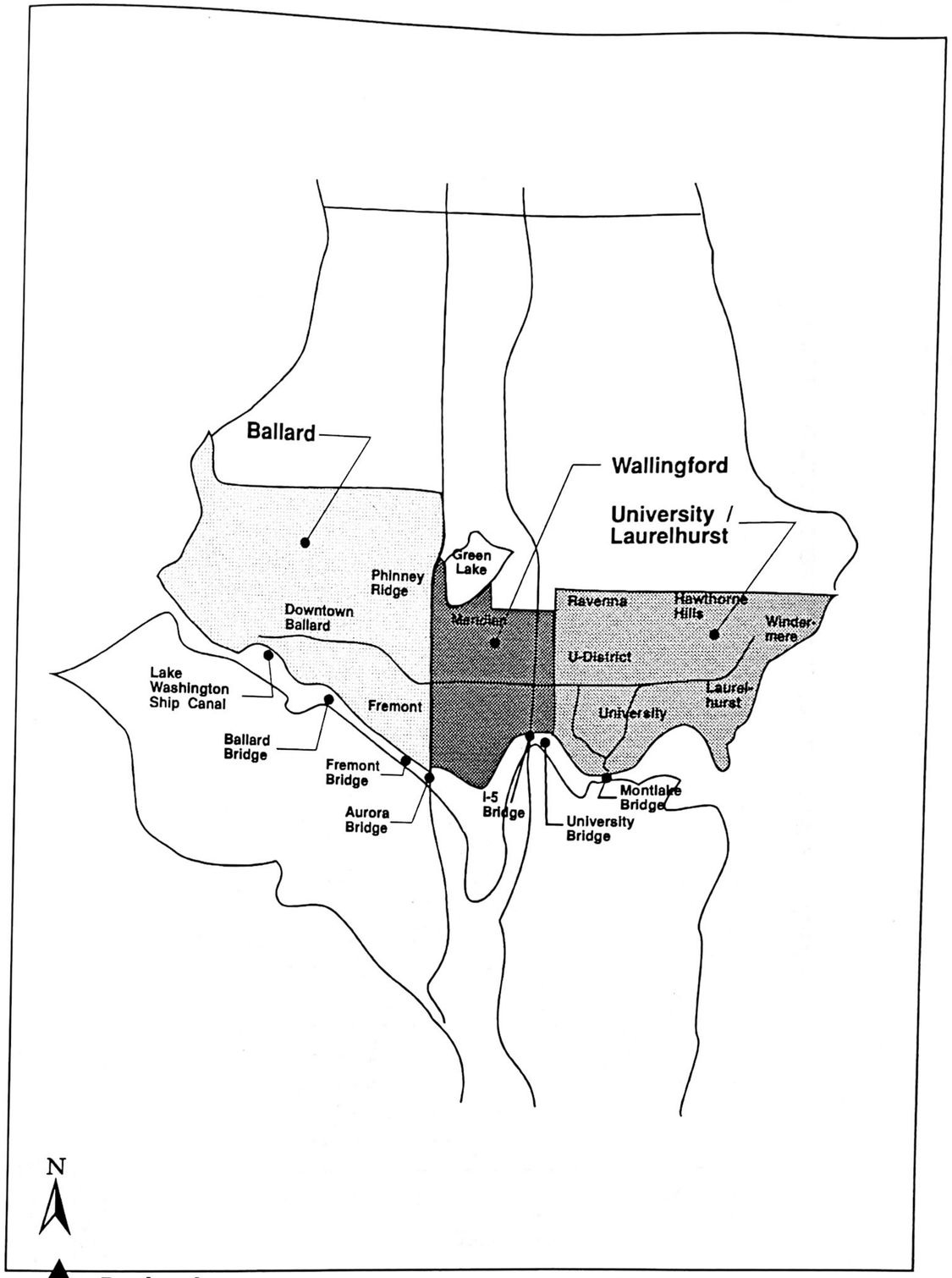
4.6.1 Background

As the alternatives were designed, a number of specific supplemental alignments or services were proposed as either substitutes to one of the alternatives or as additional service. Although a number of options were studied during the system plan formulation, there were several studies undertaken to address needs in specific subareas. The sections which follow summarize the most significant studies.

4.6.2 Ballard to Laurelhurst Study

The *Ballard to Laurelhurst Study Corridor Study*, PB/KE Team, October 1991, was conducted to determine the need for improvements for one of the major crosstown arterial corridors in the area immediately north of the Seattle downtown as illustrated in **Figure 4-14**. These improvements would be a major supplement to the RTP North Corridor rail alignment. The communities within the study area are among the oldest in Seattle and include: Ballard; the University District; Wallingford and Laurelhurst. There are also concentrations of commercial facilities, e.g., the University of Washington and University Hospital. The principal transit route in the area, Route 43, is one of the most heavily utilized and productive in the Metro system. However, the route suffers from poor reliability due to traffic congestion. Five technologies were considered for this corridor: enhanced bus service; LRT in street operation; automated people movers; personal rapid transit (PRT); and terrafoils. These technologies were tested against 15 criteria and ranked. The enhanced bus service ranked first and the LRT second. A fatal flaw analysis was also conducted. **Figure 4-15** shows that the corridor topography is quite varied and difficult and does not accommodate all forms of transit. These constraints and other considerations eliminated all but the enhanced bus and LRT.

Present corridor ridership is currently about 13,000 riders per day. Daily ridership is expected to increase to 21,500 by the year 2020 which would be the upper limit of the enhanced bus technology and further ridership demand would have to be satisfied by switching to LRT.



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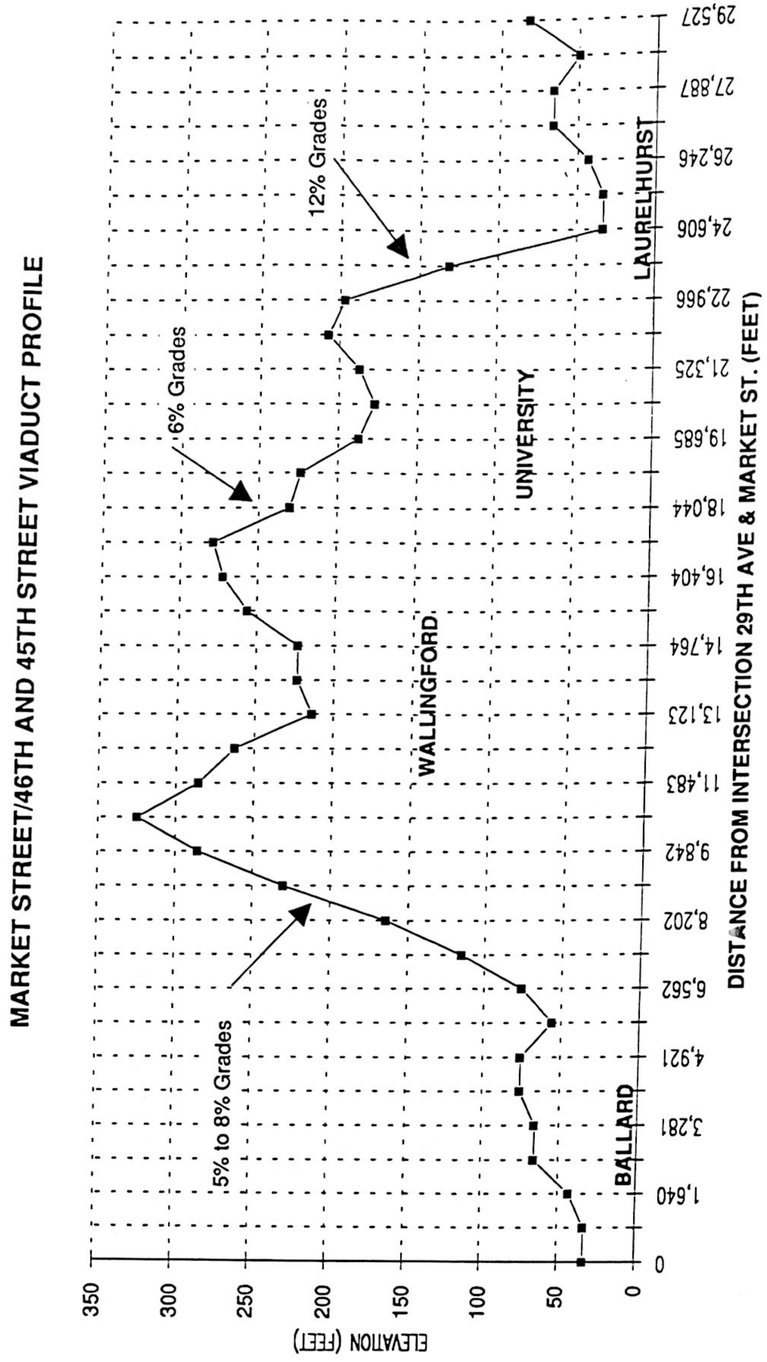
Ballard to Laurelhurst Study Area
System Plan
FIGURE 4–14



Ballard to Laurelhurst Study - Proposed Route Profile

System Plan

FIGURE 4–15

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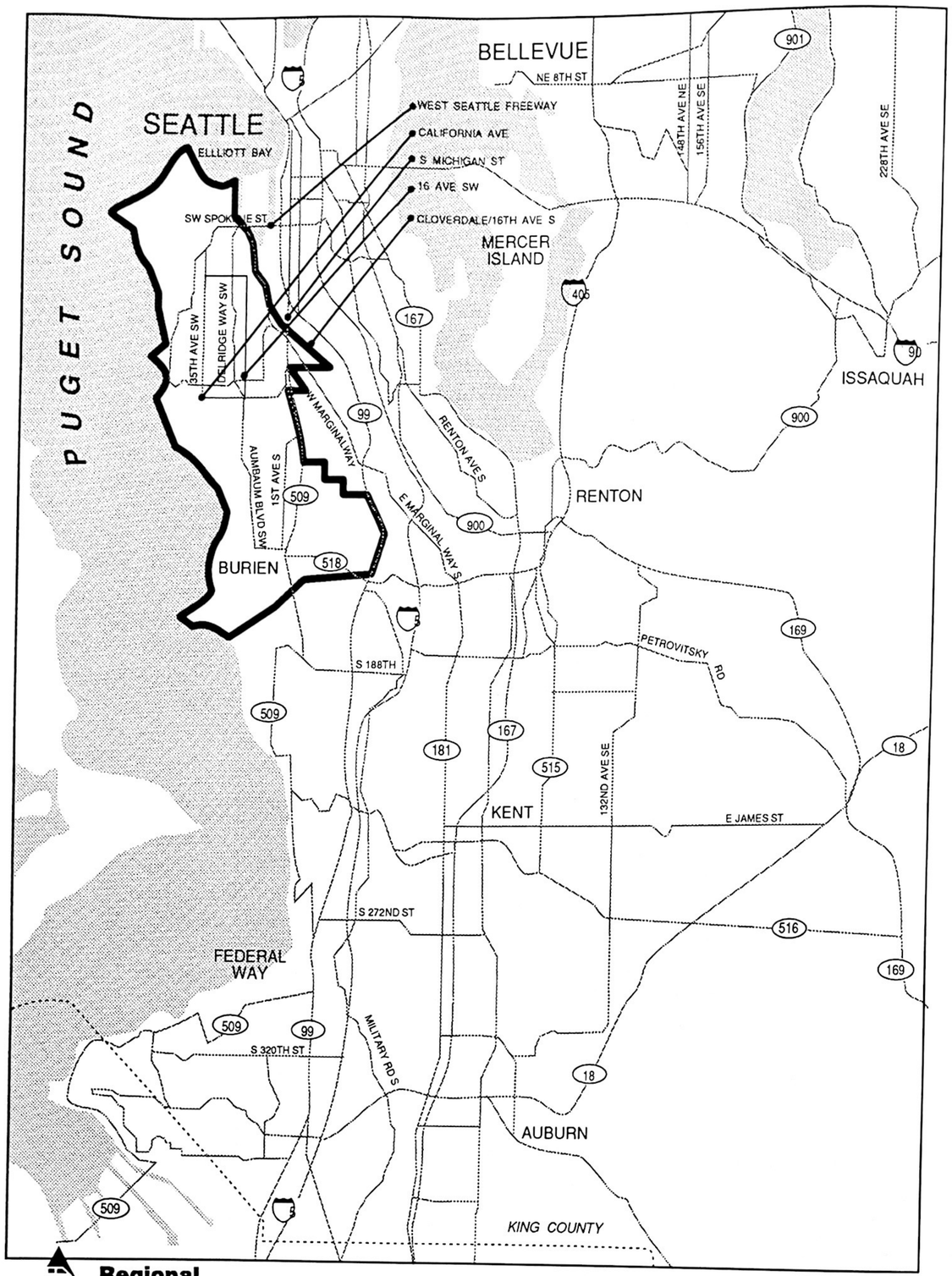
It was recommended that further study be done to determine which of the two technologies to use within the corridor, to design the proper alignment and facilities, and to resolve many of the outstanding issues, e.g., the elimination of much of the existing on-street parking.

4.6.3 West Seattle Study

The *West Seattle Study*, PB/KE Team, October 1991, evaluated the feasibility of additional bus service connections with the RTP South Corridor rail alignment. West Seattle is a rolling upland peninsula across Elliott Bay from downtown Seattle. This area merges with the ridge that separates Puget Sound from the Green River valley. Except for some small redevelopment areas, West Seattle is a relatively stable urban residential area which is expected to grow by only one percent over the next ten years. However, households are getting smaller and more numerous as the average number of residents increases.

The street system is a grid pattern overlaid on rolling, sometimes steep, topography. The West Seattle Freeway is the principal east-west tie to Seattle. There are only a few continuous major arterials in the community. At the present time 21 bus routes serve the West Seattle study area composed of five express, two shuttle and 14 local routes. In general, ridership on local and shuttle routes varies significantly. The express routes are well utilized, especially in the peak periods.

Based on the findings of the study, it was recommended that Bus Route 20 be extended from the West Seattle Freeway south to SR 518 then east to SR 99, a distance of about 12 miles, as shown in **Figure 4-16**. This extension would provide a needed north-south connection and direct access to both the Seattle CBD and the South Corridor rail line. Service would also be increased to 15-minute frequencies during peak hours. It was also recommended that the two existing transit hubs be upgraded with more layover space to facilitate the timed transfer of passengers.



West Seattle Study Area
System Plan
FIGURE 4–16

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4.6.4 Benson Highway Study

The *Benson Highway Study*, PB/KE Team, October 1991, evaluated a potential connection between the rapidly growing areas along the Benson Highway (SR 515) and Renton and the South Corridor high capacity transit alignment. The study area is an irregularly shaped, fast growing urban corridor south of Lake Washington. The study area includes Renton and Tukwila on the north, Kent in the middle and Auburn to the south. Future population growth is expected to be slightly lower than the region as a whole, but households and employment are expected to grow faster than the average.

There are a number of problem roadways in the study area with peak period levels of service of E and F, especially on the Benson Highway, 132nd Avenue SE, and Petrovitsky Road. Lane widening is under way on East James Street and Benson Highway, but this improvement is only expected to relieve the congestion at principal choke points and not solve the overall congestion problem. Transit service consists of seven express routes to the Seattle CBD with heavier than average ridership, especially on Route 150. These routes are shown in **Figure 4-17**.

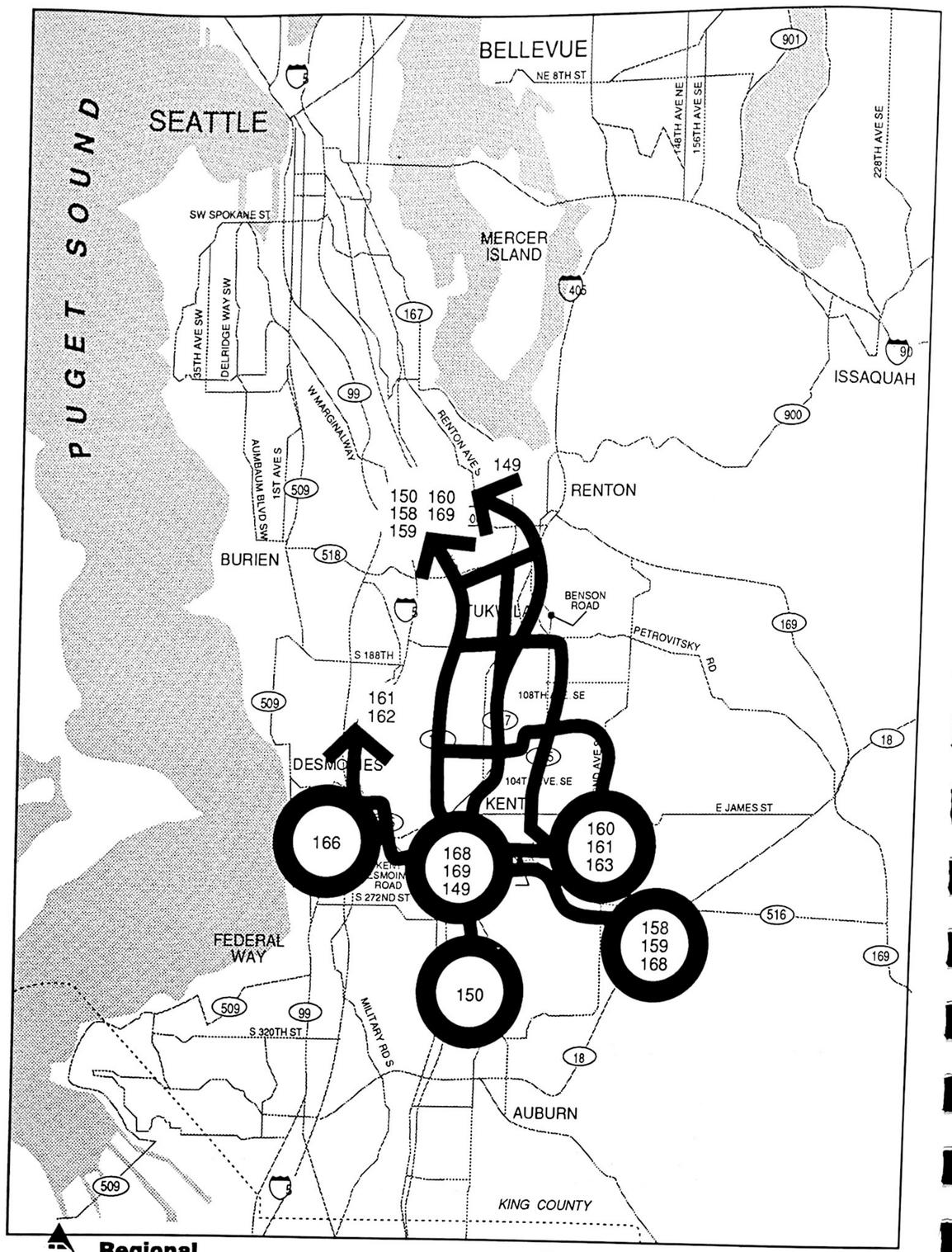
Metro recently initiated three new bus routes in the area and increased ridership is expected. It was also recommended that HOV queue-by-pass improvements be made in several locations and a new park-and-ride facility be built at 92nd Street and Benson Highway. In addition, local feeder bus service should be evaluated as development increases in the area.

4.65 Other Studies

In addition to the studies discussed above, there were a number of other studies conducted which are related to the RTP System Plan. These studies fall into two categories: detailed analysis of areas of special concern; and alternatives to the System Plan.

4.6.5.1 Detailed Analyses

Use of I-90 Floating Bridge for Rail Transit Analysis, PB/KE Team, November 1991, was conducted to determine the feasibility of adding both the East Corridor light rail train and an express busway to the I-90 floating bridge. No fatal flaw to the proposal was discovered.



Benson Highway Transit Routes
System Plan
FIGURE 4–17

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It was concluded, with some reservations for further study, that both LRT and the busway could be accommodated on the bridge.

North Corridor: Seismic Retrofit of Lake Washington Ship Canal Bridge and East Galer Viaduct, PB/KE Team, February 1992, was conducted to determine the feasibility of seismic retrofit of the Lake Washington Ship Canal Bridge as a link in the I-5 corridor rail alternative. The determination was that the retrofit was feasible and acceptable.

The North Corridor Tunnel Alignment Workshop Study, PB/KE Team, October 1991, was conducted in conjunction with several WSDOT representatives to determine the feasibility of tunneling under the I-5 foundations near the Convention Center in downtown Seattle as a connection to the Capitol Hill alignment of the Rail/TSM Alternative. The determination was that such a tunnel was feasible.

The Non-Motorized Access Study, PB/KE Team, December 1991, was conducted to plan bicycle and pedestrian access to the proposed LRT stations. The study was conducted with the participation of many representatives of local communities and the bicycle associations. The study recommended the enlargement and connection of all bike paths to the proposed station areas. It was estimated that this would increase the non-motorized service area many times and reduce the amount of commuter parking required at the stations.

4.6.5.2 RTP System Plan Alternate Studies

Analysis of the Rhododendron Line Concept, PB/KE Team, September 1991, was proposed by a group of citizens as an alternative to the North and South Corridors Rail/TSM Alternative. The proposal was to build an at-grade LRT system to operate in the median of Aurora Avenue (SR 99). There were three principal reasons for this proposal including: 1) to provide relatively low cost fixed-rail transit in this transportation corridor; 2) to provide a pedestrian-oriented transit element that would enhance both the roadway and surrounding areas; and 3) to redevelop the corridor at greater densities and to be more transit friendly. All of these efforts would then contribute to the drastic reduction of dependence on the auto for the corridor residents.

The primary goal of the proposal was not to provide a regional transit system, but rather to redevelop Aurora as a classic "streetcar corridor" typical of late 19th and early 20th century land use and public transit patterns. This type of development was largely abandoned as greater

TABLE 4.3

SUMMARY COMPARISON OF ALTERNATIVES BY CORRIDOR AND COUNTY (CAPITAL COSTS IN 000's $)

RTP Alternative	Corridor			County			Total
	North	East	South	King	Snohomish	Pierce	
TSM Component of Alternative							
No-Build	548,100	233,555	433,602	977,634	143,196	94,427	$1,215,257
TSM	1,509,532	922,972	2,293,749	3,059,471	696,225	970,556	$4,726,252
Transitway – TSM	1,471,991	885,447	2,212,422	2,917,968	677,408	974,483	$4,569,860
Rail – TSM	1,074,357	640,224	1,788,183	2,052,130	566,020	884,614	$3,502,764
RTP Alternatives, With TSM Component Added							
No-Build	$548,100	$233,555	$433,602	$977,634	$143,196	$94,427	$1,215,257
TSM	$1,509,532	$922,972	$2,293,749	$3,059,471	$696,225	$970,556	$4,726,252
Transitway – TSM	1,471,991	885,447	2,212,422	2,917,968	677,408	974,483	4,569,860
Transitway	426,862	196,409	220,405	778,914	64,761		843,676
Transitway Total	$1,898,853	$1,081,856	$2,432,827	$3,696,882	$742,169	$974,483	$5,413,535
Rail – TSM	1,074,357	640,224	1,788,183	2,052,130	566,020	884,614	3,502,764
Rail	2,980,893	2,624,336	2,332,963	5,883,552	1,688,365	366,279	7,938,194
Rail Total	$4,055,250	$3,264,560	$4,121,146	$7,935,682	$2,254,385	$1,250,893	$11,440,958

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Everett Transit will double its number of demand-responsive vans, increase demand-responsive service hours, and equip 60 percent of its buses with wheelchair lifts. Similar arrangements are being explored by Pierce and Community Transit. In addition, the RTP proposes expanding supplemental service programs for non-ADA eligible low-income seniors and persons with disabilities by 25 percent beyond the current plan. This proposal is the same for all the System Plan alternatives.

4.3 Transportation Systems Management Alternative

4.3.1 TSM Concept

The TSM Alternative emphasizes a substantial increase in transit service in the region. As compared to the Transitway/TSM or Rail/TSM Alternatives, it would enhance transit and HOV operations with lower-cost capital improvements and smaller-scale general traffic and HOV improvements. This alternative provides the baseline against which the cost-effectiveness of major transitway or rail investments will be evaluated and a framework for the Transitway/TSM and Rail/TSM Alternatives.

The TSM Alternative would increase regional and community transit service to and between the centers identified in the Vision 2020 plan. Service improvements would emphasize all-day and more frequent two-way service, with increased access to the regional system. Connections between regional centers and suburban activity centers would also increase. Improved transit centers and new park-and-ride spaces would accommodate the proposed expansion of service. To support this service concept, TSM capital improvements would expand and enhance the freeway HOV network of the No-Build Alternative, adding projects to improve transit system speed and reliability. The alternative would provide better access to the freeway HOV network and give HOVs priority on key arterial roadways. The TSM Alternative also includes capital projects directed toward increasing the speed and reliability of transit operations on arterials, including intersection bypass lanes, signal priority and parking limits along some arterials. Three routes in the City of Seattle serving Ballard and the University District would be converted from diesel to trolley service.

4.3.2 TSM Capital Facilities

The TSM Alternative is described in the *Transportation System Management Alternative Report,* PB/KE Team, January 1992. The detailed description and evaluation of specific facilities would occur subsequent to adoption of the System Plan. The facility locations described here as part of this alternative are illustrative of the alternative for purposes of system evaluation.

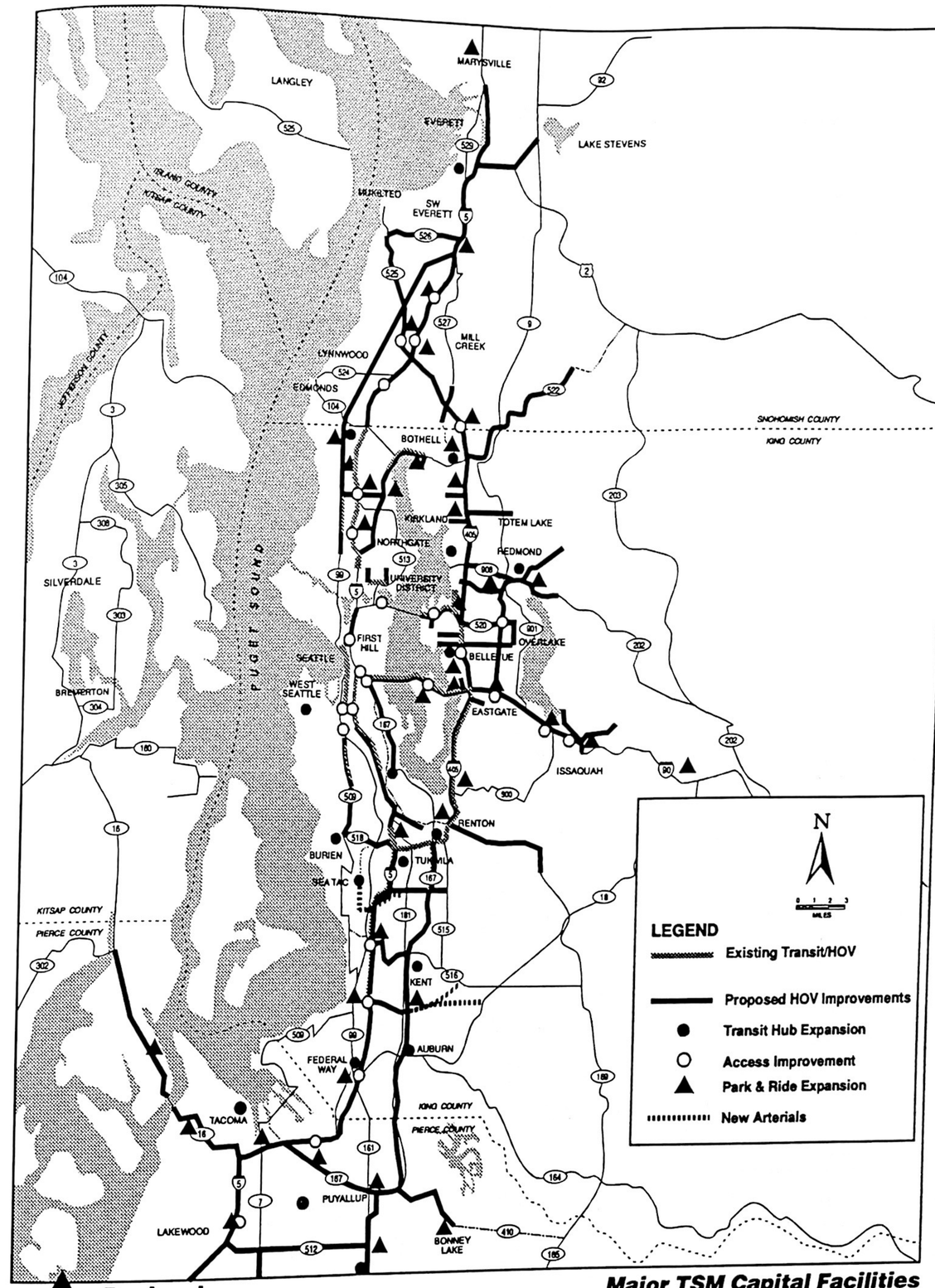
4.3.2.1 Types of Facilities

Transit and HOV enhancement projects which would be completed between 1992 and 2020 include: development of additional HOV lanes, and implementation of measures to give priority to transit and carpool movements on arterials and freeways as shown in **Figure 4-3**. Other TSM improvements would increase the speed and reliability of transit operations within congested urban areas by increasing the distance between some bus stops; construction of pullout locations; and adjustment of signal timing to give buses and HOVs priority at congested intersections. Passenger transfers would be enhanced by giving transit centers more efficient bus access, better pedestrian access and amenities. In addition, new freeway flyer stops and stations would be constructed next to selected park-and-ride lots, allowing buses to pick up and drop off passengers without leaving freeway rights-of-way.

The TSM Alternative would include direct access ramps to HOV and bus lanes, direct freeway access to park-and-ride lots and transit centers, and new and expanded park-and-ride lots. The alternative would include expansion of bus operating and maintenance facilities, overhead trolley wire extensions, and expansion of the staging areas at the entrances of the Downtown Seattle Transit Tunnel.

4.3.2.2 Cost of Facilities

The TSM Alternative would cost about $3.5 billion more than the No-Build Alternative as shown in **Table 4.3**.



Major TSM Capital Facilities
System Plan
FIGURE 4-3

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4.3.3 Corridor-Specific TSM Capital Projects

The following sections outline the TSM projects by corridor which would be implemented by 2020. These are representative projects in general locations which would be in addition to the No-Build Alternative. Their final configurations and feasibility have not been determined.

4.3.3.1 North Corridor

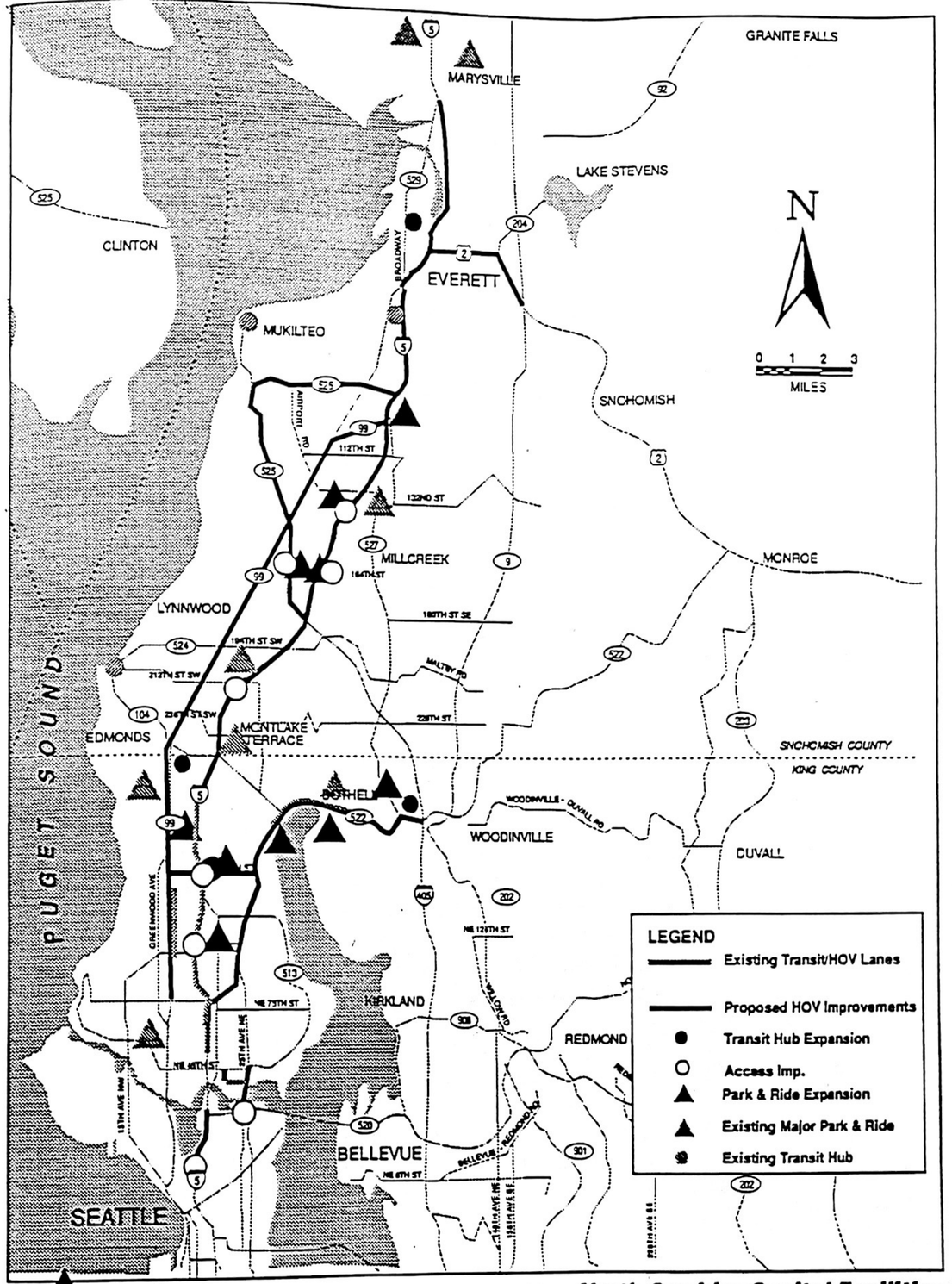
New HOV lanes would total 74 lane-miles on freeways and 17 lane-miles on arterials. Approximately 5,300 new park-and-ride spaces would be added in the North Corridor. These improvements are shown in **Figure 4-4**.

Interstate 5. Ramps, priority signalization, and lanes to allow buses to bypass congestion at traffic lights would improve transit access between I-5 and the Convention Place Station, the Northgate Transit Center, NE 145th Street, NE 175th Street, the Lynnwood park-and-ride, a new 164th Street SW park-and-ride, and Mariner park-and-ride. A new south Everett park-and-ride would take advantage of freeway access at 112th Street SE provided under the No-Build Alternative. I-5 HOV lanes would be extended from 195th Street in King County to Marysville in Snohomish County. A northbound HOV lane would extend from Olive Way to SR 520.

State Route 99. Improvements would include a bus-only lane from Green Lake to the King County line, HOV lanes on segments in Snohomish County, priority signalization, and queue bypass lanes. HOV/bus lanes would extend the length of SR 99 from the King County line to Everett.

State Route 522. Improvements would include an eastbound bus-only lane, HOV lanes, priority signalization, and queue jump lanes at selected locations.

State Route 2. Improvements would include HOV lanes from I-5 to SR 9.



North Corridor Capital Facilities
System Plan
FIGURE 4-4

Regional Transit Project
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State Route 525. Improvements would include HOV lanes from I-5 to SR 526 in Mukilteo.

State Route 526. Improvements would include HOV lanes from I-5 to SR 525.

Park-and-Ride Lots and Transit Centers. Park-and-ride lots and transit centers would be expanded or added at Aurora Village, Shoreline, Northgate, Lake City, Kenmore, and I-5 at North 145th Street, North 175th Street, 164th Street SW, Swamp Creek, SR 526, the Mariner park-and-ride and Everett.

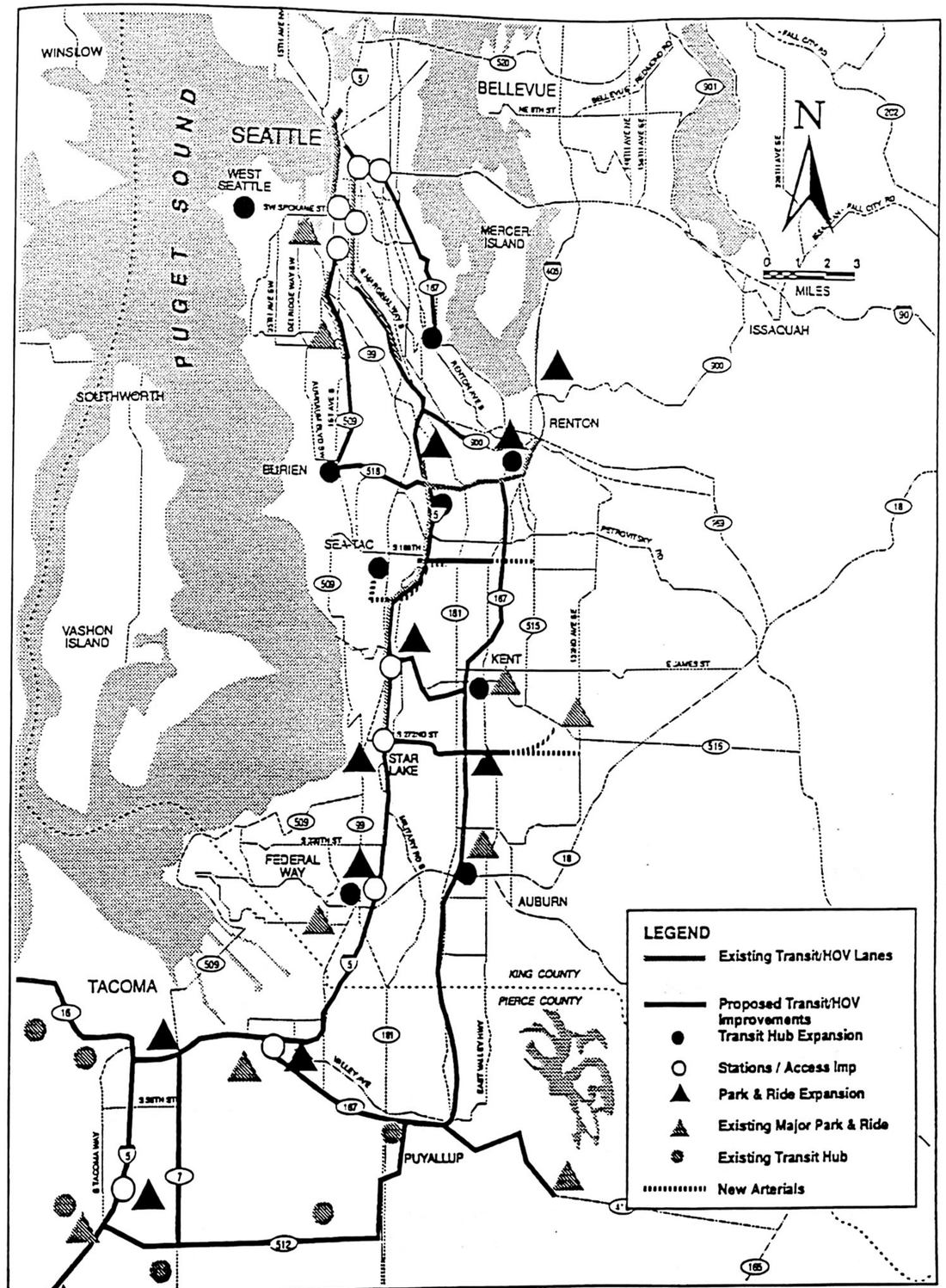
Other Improvements. Projects to give HOVs and buses priority at intersections would be installed on local arterials, including 145th Street, Montlake Boulevard, and 15th Avenue NE in the University District. Bypass trolley wire for express trolleys on Route 2 to Queen Anne Hill and a second track for the waterfront streetcar would be added.

4.3.3.2 South Corridor

New HOV lanes would total approximately 191 miles on freeways and 78 miles on arterials. Park-and-ride capacity would be expanded by about 5,300 stalls, as shown in **Figure 4-5**.

Interstate 5 Corridor. Improvements include connection of the E-3 busway to I-5 and the West Seattle Freeway and improved access between I-5 and South Spokane Street, completion of center HOV lanes on I-5 from Spokane Street to Lakewood (south of Tacoma), and an arterial HOV lane on SR 900 southbound from I-5 to South 129th Street. Ramps would provide access to the I-5 center HOV lanes from SR 516, South 272nd Street, the Federal Way park-and-ride at South 320th Street, and near the new SR 167/I-5 interchange. On-line stations would be built at South 272nd Street in King County and at 84th Street South in Pierce County.

Rainier Avenue South. Improvements include grade-separated access ramps connecting Rainier Avenue South transit service to the Downtown Seattle Transit Tunnel and priority signalization for HOVs.



South Corridor Capital Facilities
System Plan
FIGURE 4-5

Green River Valley. Improvements include HOV lanes on SR 167. Queue bypass lanes are proposed for congested intersections along SR 181 at South 192nd, SR 516 and the South 272nd/277th Street extension.

State Route 509. Improvements would include an HOV ramp connecting the bridge to Fourth Avenue South, and HOV lanes from Cloverdale to SR 518, facilitating routing Burien express service through the DSTT.

State Route 169. Improvements include HOV lanes from Cedar Grove to I-405.

Pierce County HOV Lanes. Additional lanes would be built on SR 512 from I-5 to SR 167, SR 7 from SR 509 to SR 512, SR 410 from SR 167 to the South Bonney Lake park-and-ride, and SR 161 from 176th to SR 512.

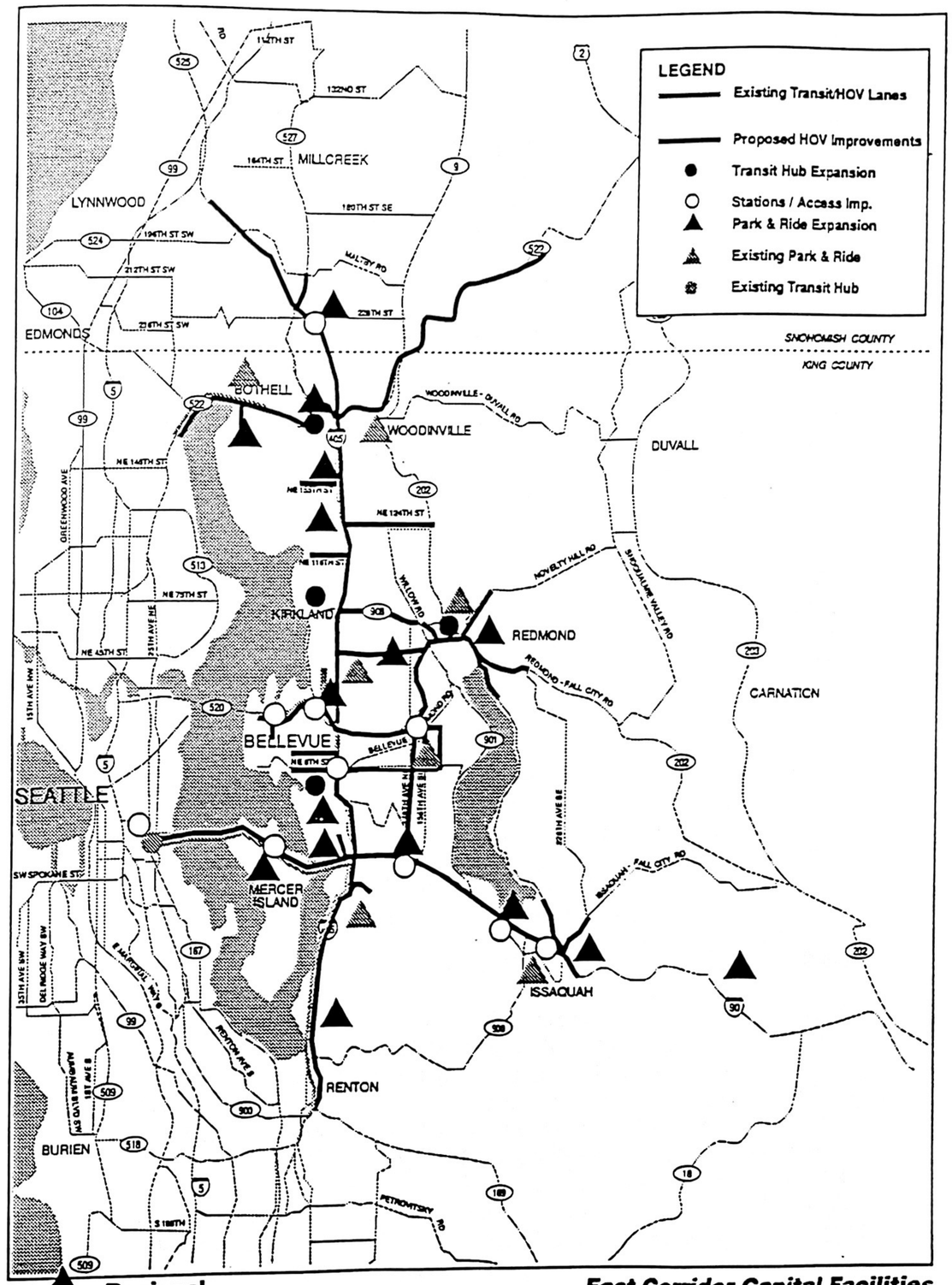
Transit Centers and Park-and-Ride Lots. Improvements would include expansion and access improvements to existing transit centers and development and expansion of new transit centers at Auburn, Federal Way, Kent, SeaTac, Burien, Southcenter, South Renton, Rainier Avenue South/South Henderson Street, and West Seattle. Park-and-ride capacity would be increased at Kenneydale, Tukwila, Kent-Des Moines Road, Star Lake, Federal Way, South Federal Way, Fife/Puyallup, the Tacoma Dome, and near Lakewood.

4.3.3.3 East Corridor

New HOV lanes would total about 104 miles on freeways and 17 miles on arterials. Park-and-ride capacity would expand by approximately 3,800 stalls. The East Corridor TSM capital improvements are illustrated in **Figure 4-6**.

Interstate 90. A two-way center-lane transitway operating all day between the Downtown Seattle Transit Tunnel and Bellevue Way and through HOV lanes and associated HOV and transit access ramps from I-405 to Front Street in Issaquah.

Interstate 405. Completion of shoulder HOV lanes and associated access ramps from Sunset Highway in Renton to I-5 in Snohomish County.



East Corridor Capital Facilities
System Plan
FIGURE 4-6

State Route 202. HOV bypass lanes from SR 520 to Sahalee Way.

State Route 520. HOV lanes and associated access ramps on SR 520 from the Evergreen Point Bridge to SR 202 in Redmond, and measures to give priority to HOVs at the intersections of SR 520 with Avondale and Union Hill Roads.

State Route 522. HOV lanes would extend past Bothell to the Snohomish River.

State Route 908. HOV bypass lanes from I-405 to Willows Road.

Arterial HOV treatments on NE 132nd Street, NE 124th Street, NE 116th Street, NE 68th/70th/72nd Street, Coal Creek Parkway, Issaquah-Fall City Road, Bellevue Way, East Lake Sammamish Parkway, 84th Avenue NE, 68th Avenue NE, 156th Avenue NE, Avondale Road, Union Hill Road, Leary Way, and 148th Avenue NE.

Bellevue CBD. Improved access to the Bellevue Transit Center and major investment in downtown pedestrian circulation improvements. New ramps between I-405 and NE 10th Street would give transit priority.

Transit Centers and Park-and-Ride Lots. Development of new transit centers in Redmond and Issaquah, expansion of the existing Kirkland and Bothell transit centers, and construction of new park-and-ride capacity at Mercer Island, Eastgate, Issaquah, Canyon Park, Bothell, Brickyard Road, Kingsgate/Totem Lake, South Kirkland, Wilburton, SR 520 at NE 51st Street, and Bear Creek.

4.3.4 TSM Transit Service Plan

The TSM transit service plan is based on increased funding for transit service throughout the region. Within King County, the funding increase would be approximately 40 percent by the year 2010, with the increased funds distributed approximately proportional to population between the City of Seattle/north King County (36 percent), east King County (28 percent) and south King County (36 percent). Actual distribution of service within these areas would be based on a collaborative process with local jurisdictions. Distribution of funds would account for a number of factors, including population and employment; transit-friendly land use; transportation policies; and

density. This section describes how TSM service improvements could be developed. Actual TSM service improvements would be based on the subarea planning process to follow adoption of the System Plan. The improvements would substantially increase transit service from that which would be provided under the No-Build Alternative.

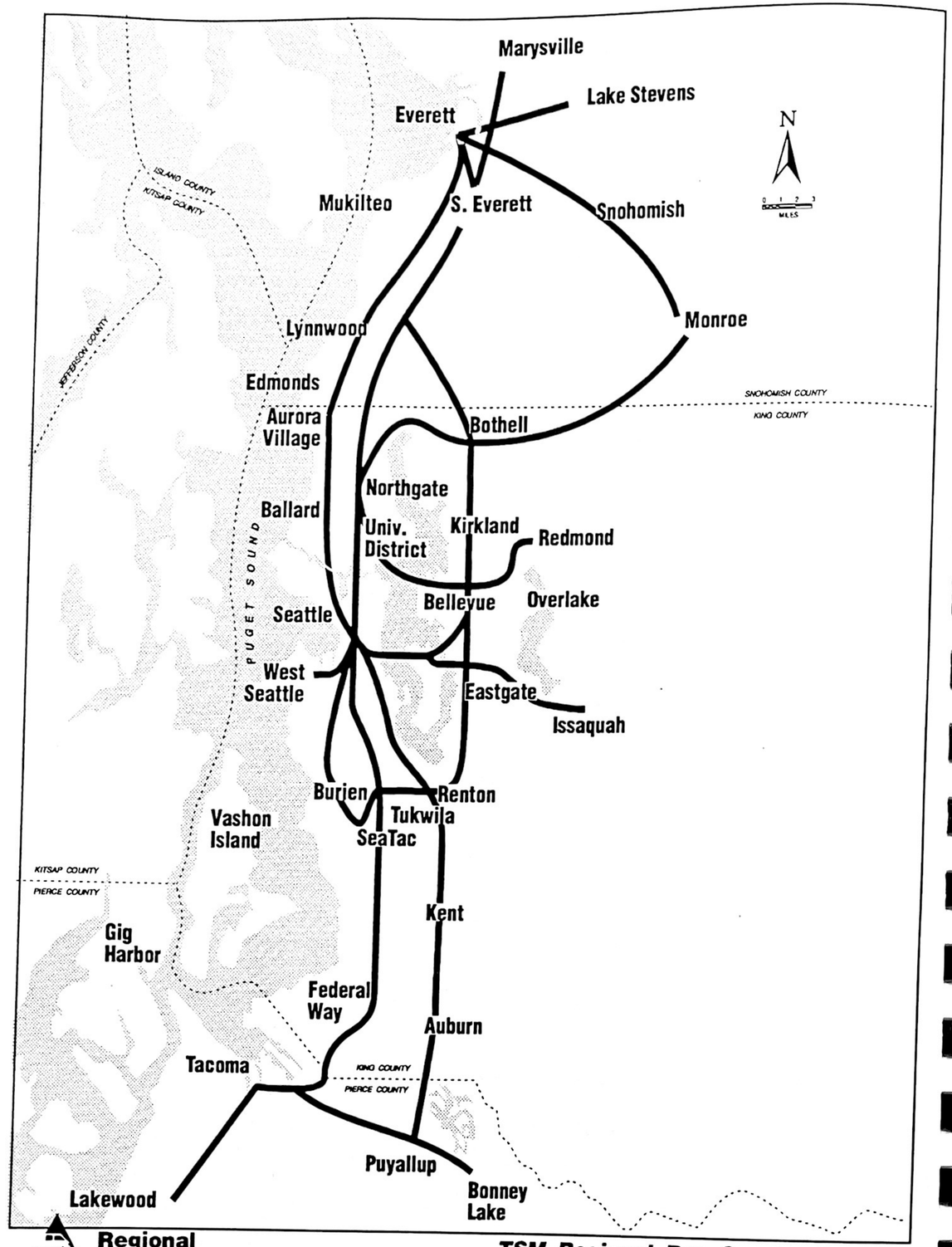
4.3.4.1 Service Orientation

The TSM transit service plan emphasizes more convenient service; provision of convenient community-based services; and access to major activity centers. The TSM regional service concept includes an improved network of regional routes which would link communities as shown in **Figure 4-7** with frequent service in both peak and off-peak directions. The regional routes would improve all-day travel among communities and regional centers. They would also improve service across county boundaries. New service would enhance connections between regional, subregional, and local activity centers, as recommended by Vision 2020. Most of the service expansion would occur in the presently urbanized areas of the region. Other new routes are oriented to the Vision 2020 forecasts for new growth of population and employment. This service would be augmented in the peak period by a series of commuter express routes serving major centers. The TSM Plan includes the following components:

- Improving access to regional destinations with frequent all-day limited-stop service;
- Frequent, all day local service to dense urban and moderately dense suburban communities;
- Expanded commuter service oriented to specific employers; and
- New demand-responsive paratransit services in lower density and rural areas.

4.3.4.2 Service System Structure

The community service concept for the TSM Alternative as shown in **Figure 4-8**, involves links between neighboring communities, links from communities to activity centers served by regional service, and areas of demand responsive or paratransit community service in lower-density



TSM Regional Bus Service Concept
System Plan
FIGURE 4-7

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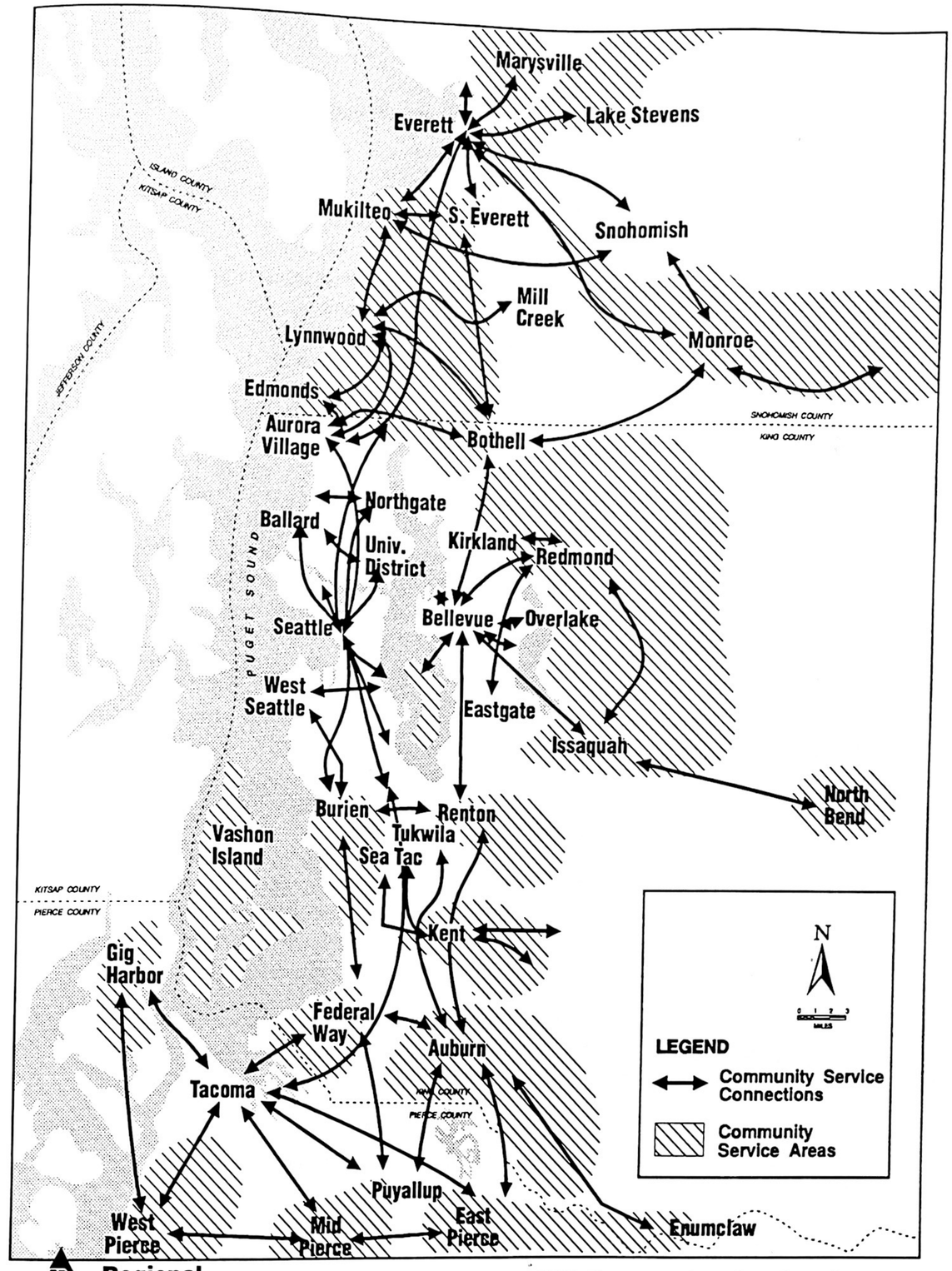

TSM Community Service Concept
System Plan
FIGURE 4-8

Regional Transit Project
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parts of the urban area. The community service concept would be implemented by:

- A group of primary bus routes operating at high frequency in urban neighborhoods and along key suburban arterials;
- A network of secondary routes to make travel between communities quicker and more convenient; and
- integration of flexible transit services to serve dispersed communities.

4.3.5 Service Hours and Frequency

Community Transit. Community Transit would double its total hours of transit service over the No-Build Alternative. A complete tabulation of the TSM route characteristics is provided in Tables 4.1, 4.3 and 4.6 of the *Transportation System Management Alternative Report*, PB/KE Team, January 1992. Service would be provided at frequencies of 30 minutes or less to downtown Seattle and 60 minutes or less to Seattle's north end throughout the day. Local Community Transit service to Bothell and Aurora Village would run at a minimum 60 minute frequency throughout the day.

Other TSM service improvements include:

- Providing service seven days a week;
- Tripling peak-hour and doubling midday service to downtown Seattle, the University District, and east King County by decreased headways on existing routes and creation of 11 new commuter routes;
- Doubling frequency on key peak-hour local suburban routes and creation of four new suburban routes from Snohomish County to downtown Bothell; and
- Increasing evening and weekend service and innovative fixed-route paratransit service to low-density areas.

Everett Transit

Everett Transit would double transit service. TSM improvements would include:

- Doubling bus frequency on peak-hour service to downtown Everett;
- Doubling bus frequency on selected midday service; and
- significantly improving commuter service to South Everett employment sites.

Metro

Metro would increase its total hours of transit service by about 78 per cent over the No-Build Alternative. According to service guidelines, local routes would provide service within walking distance of all urban areas and 0.75 miles of dense suburban areas (with access to park-and-ride lots or transit centers from remaining suburban areas), and provision of paratransit service to low density residential communities. Metro service would include:

- Minimum bus frequency of 15 minutes or better during most of the day between 6 a.m. and 10 p.m. on the primary routes within the most dense urban areas of Seattle;
- Minimum bus frequency of 30 minutes or better on the secondary routes in urban areas and on the primary routes in suburban areas of King County;
- Bus frequency of 30 and 60 minutes or better for routes within or between major suburban areas;
- Additional direct commuter routes with minimum service levels of six to twelve daily one-way trips on each route; and
- Demand-responsive service in low density suburban areas, and customized bus service to major employment sites.

Pierce Transit

Pierce Transit would increase its service by about 17 percent over the No-Build Alternative including:

- Tripling express service from Tacoma and Lakewood to downtown Seattle, with 4-minute headways on key peak-hour routes and 15-minute headways on the midday Tacoma-Seattle express route,

- Doubling bus frequencies on key peak-hour routes to employment and activity centers within Tacoma and Pierce County, and doubling bus frequencies on key midday routes to improve connections to outlying activity centers.

4.3.5.1 Corridor-Specific Service

North Corridor. The TSM service plan in the North Corridor would double Community Transit's and Everett Transit's regional service, and would increase Metro service by 45 percent. Suburban Metro platform hours would more than double. In King County, the plan emphasizes high frequency service and new transit service to the University District, Northgate and downtown Seattle; restructuring of routes around the Northgate and Aurora Village Transit Centers; and new crosstown services. In Snohomish County, the alternative would result in increased frequency of service on routes operated by Community Transit in Snohomish County between Edmonds, Mountlake Terrace, and Lynnwood, and from Snohomish County to King County, while Everett Transit would increase its service radiating from downtown Everett. Express services would operate in both directions to accommodate the increasing numbers of reverse commuters.

South Corridor. The TSM service plan in the South Corridor would increase Pierce Transit's regional service by 27 percent and would increase Metro's service by 82 percent. Service frequency would significantly increase in the corridor on both community and regional routes. The plan would provide frequent service between communities in the South Corridor. Schedule coordination at transit transfer hubs would improve connections within and between local communities.

In King County, Metro's plan emphasizes frequent all-day service on a select group of urban and suburban routes. New and expanded transit routes would serve key activity centers, including Federal Way, Auburn, south Renton, Kent, Tukwila, and the SeaTac and Boeing/Duwamish employment centers. Connections would increase between Federal Way, Auburn, Kent, south Renton, Burien, West Seattle, and Rainier Beach, as well as to regional destinations. In the low density areas of Maple Valley, Black Diamond, and Enumclaw, and also Vashon Island, paratransit (e.g., dial-a-ride) service would connect with express and local routes at park-and-rides, transit centers, and the Vashon and Tahlequah ferry terminals. Express service would be increased in the Rainier Valley and speeded up by routing Rainier Avenue South trolleys bound for downtown Seattle through the DSTT. Some West Seattle and Burien express routes would also use the E-3 Busway and the downtown tunnel resulting in better travel times and access to the north end of the tunnel.

From Pierce County, regional express service to Seattle would triple. Pierce Transit would also use its funding to increase express service to Olympia from Tacoma. Within Pierce County, frequencies would increase on community routes, particularly at peak hours, to transit centers and major employment and commercial centers, including universities and colleges, major hospitals, the Port of Tacoma, Tacoma Mall, and the 38th Street Shopping District. Service between Tacoma and suburban cities and among suburban cities would also increase.

East Corridor. The TSM service plan in the East Corridor would increase Metro's service by 113 percent. The plan emphasizes improved route coverage and frequency of service, focusing on a network of local community and express transit routes between major activity centers on the Eastside. Primary suburban routes would connect activity centers, transit hubs, and park-and-rides at Bothell, Woodinville, Kirkland, Redmond, Overlake, Eastgate/Factoria, and Issaquah. New and expanded transit routes would connect East Corridor communities to regional centers, including downtown Bellevue, the University District and downtown Seattle. In the lower density areas of Duvall, Novelty Hill, Carnation, Fall City, Snoqualmie, and North Bend, dial-a-ride service would connect with express/local routes at park-and-rides and transit centers. Customized bus service would be provided from the Eastside to Everett and the Duwamish industrial area. Community Transit would expand its express service between Snohomish County and Bellevue and add service to Redmond and Bothell.