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Policy Brief

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The need for speed

This"is the fourth of a series of Policy Briefs examining the Phase 1 Proposal of the Central Puget Sound Regional Transit Authority (RTA), which will go to the voters on March 14. The Regional Transit System Master Plan *is subtitled:* Fighting congestion. Moving People. *This brief reviews the role of regional rapid transit in VISION 2020.*

The role of high capacity transit in VISION 2020

In October 1990, the General Assembly of the Puget Sound Council of Governments formally adopted *VISION 2020, Growth and Transportation Strategy for the Central Puget Sound Region* to serve as the region's long-range planning framework.

The land use element of VISION 2020 calls for concentrating future growth in a limited number of central places, while the transportation element of the planning framework envisions a hierarchy of public transit networks that would support the system of regional centers. At the peak of the hierarchy would be a regional rapid transit system providing reliable, high speed, high capacity connections between the centers.

The Joint Regional Policy Committee's plan

In August 1990, the Joint Regional Policy Committee (JRPC) was formed under the state's High-Capacity Transportation Act. Committee members included representatives of Metro, Pierce Transit, Community Transit, and Everett Transit, as well as the state Secretary of Transportation. The committee guided the Regional Transit Project, which worked to develop a plan for a high capacity transportation system consistent with VISION 2020. In June of 1993, JRPC adopted the Regional Transit System Plan. This plan proposed that $7.5 billion (1991$) be spent to construct two distinct regional rail systems. The first system, Commuter Rail, would connect Everett, Seattle, Renton, and Tacoma with diesel trains running on existing freight tracks. The second system, dubbed Rapid Rail by JRPC, would connect these four cities with electric trains running on a new right-of-way. Rapid Rail also would extend east from Seattle across the I-90 bridge to Totem Lake and Redmond. Either Commuter Rail or Rapid Rail would extend from Tacoma south to Lakewood. The JRPC plan left undecided the choice between heavy rail and light rail equipment for Rapid Rail, but specified that the trains would achieve maximum speeds ranging from 35 to 70 miles per hour and average speeds from 25 to 40 miles per hour. To achieve these speeds the trains would run primarily in exclusive right-of-ways.

Heavy rail vs. light rail

The terms heavy rail and light rail often confuse people. It is not weight that distinguishes the two modes; rather, it is the manner in which vehicles receive electricity. Heavy rail trains draw power from a third rail, while light rail trains draw power from overhead wires. With the source of power on the ground, heavy rail systems must be designed to keep pedestrians and automobiles away from the tracks. Often heavy rail systems are "grade-separated," running through tunnels or on aerial structures. Sometimes heavy rail systems are placed "at-grade" in the medians of freeways. In any case, this separation results in a system that runs at a fairly high speed. Light rail is a more variable technology. At one extreme you find small vehicles—streetcars—running singly on rails on city streets. Interference from auto traffic makes these systems quite slow. At the other extreme are systems running multiple car trains on tracks that are fully grad-separated. Fully grade-separated light rail can achieve performance comparable to heavy rail. Between these extremes, light rail can operate in exclusive lanes on streets and highways. In this case, interference from cross traffic reduces speed somewhat. As the degree of separation increase, both cost and performance increase.

RTA

During the summer of 1993, Snohomish, Kind, and Pierce counties formed the RTA to carry forward the JRPC plan. The RTA chose to break its project into phases and to seek voter approval initially for only the first phase.

The RTA found the flexibility of light rail extremely attractive. In the central segments of the network, where ridership is high and automobile traffic is most congested, the system could be fully grad-separated. While at the outer edges of the system, with lower ridership and less interference from traffic, RTA could save money by accepting less separation.

On Sept. 9, 1994 RTA issued the "Phase 1 Study Options Results Report." This report presented three options for the first phase of construction. All three included commuter rail from Everett to Lakewood. Study Option 1 featured 13 miles of at-grade light rails, with an average speed of 20 miles per hour. Study Option 2 included 44.7 miles of light rail with an average speed of 22 miles per hour. Study Option 3 included 66.1 miles of light rail with an average speed of 26 miles per hour. When choosing a Phase 1 plan, however, the RTA board could "mix and match" elements from the various options, and the board could choose from a list of supplemental elements that were included in none of the three explicit options.

When the RTA board finished the process of mixing and matching, the actual Phase 1 system was longer and more expensive than Study Option 3. The final version added mileage to the north and south, while it downgrade from light rail to commuter rail east of Lake Washington and from grade-separated to at grade in parts of Seattle. Here, the flexibility of light rail, the ability to trade-off cost against speed, may have worked to the system'' disadvantage.

To hold down annual cost, Phase 1 was extended five years, through 2010. The total cost through 2010 would be $6.7 billion (1995$).

System speed

For commuter rail, the trip from Lakewood to King Street in Seattle will take 69 minutes, at an average speed of 41 miles per hour. The trip from Everett to King Street will take 61 minutes, at an average speed of 34 miles per hour.

Table 1 shows travel times between a number of stations along the light rail line. By light rail, the average speed on the trip from 164th SW in Snohomish County to the International District Station (IDS) in Seattle is 28 miles per hour. The average speed from Overbrook to IDS is 26 miles per hour; from downtown Tacoma IDS, 25 miles per hour.

-Kriss Sjoblom

RTA Light Rail System

Travel Time in Minutes

	Overlake	Bellevue Central	9th & Pacific	S. 348th	Sea-Tac	Boeing Access Road	International District Station	Convention Place Station	Northgate
164th SW (Snohomish County)	79	65	134*	111*	85*	73*	44	39	22
Northgate	57	43	105	82	56	44	22	17 -	
Convention Place Station	40	26	88	65	39	27	5 -		
International District Station	35	21	83	60	34	22 -			
Boeing Access Road	57*	43*	61	38	12 -				
Sea-Tac	69*	55*	49	26 -					
S. 348th (south Federal Way)	95*	81*	23 -						
9th & Pacific (Tacoma)	118*	104* -							
Bellevue Central	14 -								

*Assumes a lay-over of 7.5 minutes while transferring between trains.

Source: RTA, WRC Calculations