SeaTac People Mover Study

Final Report

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SEATAC PEOPLE MOVER STUDY
EXECUTIVE SUMMARY

PURPOSE OF THE STUDY

The objective of the SeaTac People Mover Study is to produce a feasibility analysis for a people mover system within the City of SeaTac. The Study is guided by a Steering Committee composed of representatives of:

- Municipality of Metropolitan Seattle (Metro)
- The City of SeaTac
- Seattle–Tacoma International Airport (Sea–Tac)
- King County
- Private Businesses and Development Community of the Study Area

The ultimate objective of this study is to allow the Steering Committee to make an informed decision whether or not a people mover system is feasible, viable, and worth pursuing beyond this stage of study. The purpose of this study is to determine whether such a system could have a worthwhile mitigating effect on present and future traffic in a limited area of the City of SeaTac and/or the Airport.

STUDY AREA CHARACTERISTICS

What is the study area?

The SeaTac People Mover Steering Committee established the limits of the study area at the outset of the study. With reference to Figure E–1, the study area is bounded by 140th Street South, the eastern limit of commercial development fronting International Boulevard (SR 99), 216th Street South and SR 509 to the west of Sea–Tac Airport.

What are the current and projected land uses in the study area?

Figure E–1 shows a wide variety of existing land uses and trip generators in the SeaTac People Mover Study area. Sea–Tac Airport is a destination for the majority of trips in the area. The Airport is the most prominent and largest land use in the study area. The study also focuses on areas along International Boulevard and the 28th/24th Corridor to the south of the Airport. Along International Boulevard and elsewhere in the study area are numerous hotels, park–and–fly lots, automobile rental agencies, offices and major employers. Major future mixed use developments to include offices, hotels and commercial uses are proposed in the 28th/24th Corridor, and to the

south in the Des Moines Business Park. The Port plans to locate most of its future remote airport employee parking spaces in a new lot to be developed near 24th Avenue South and SR 518.

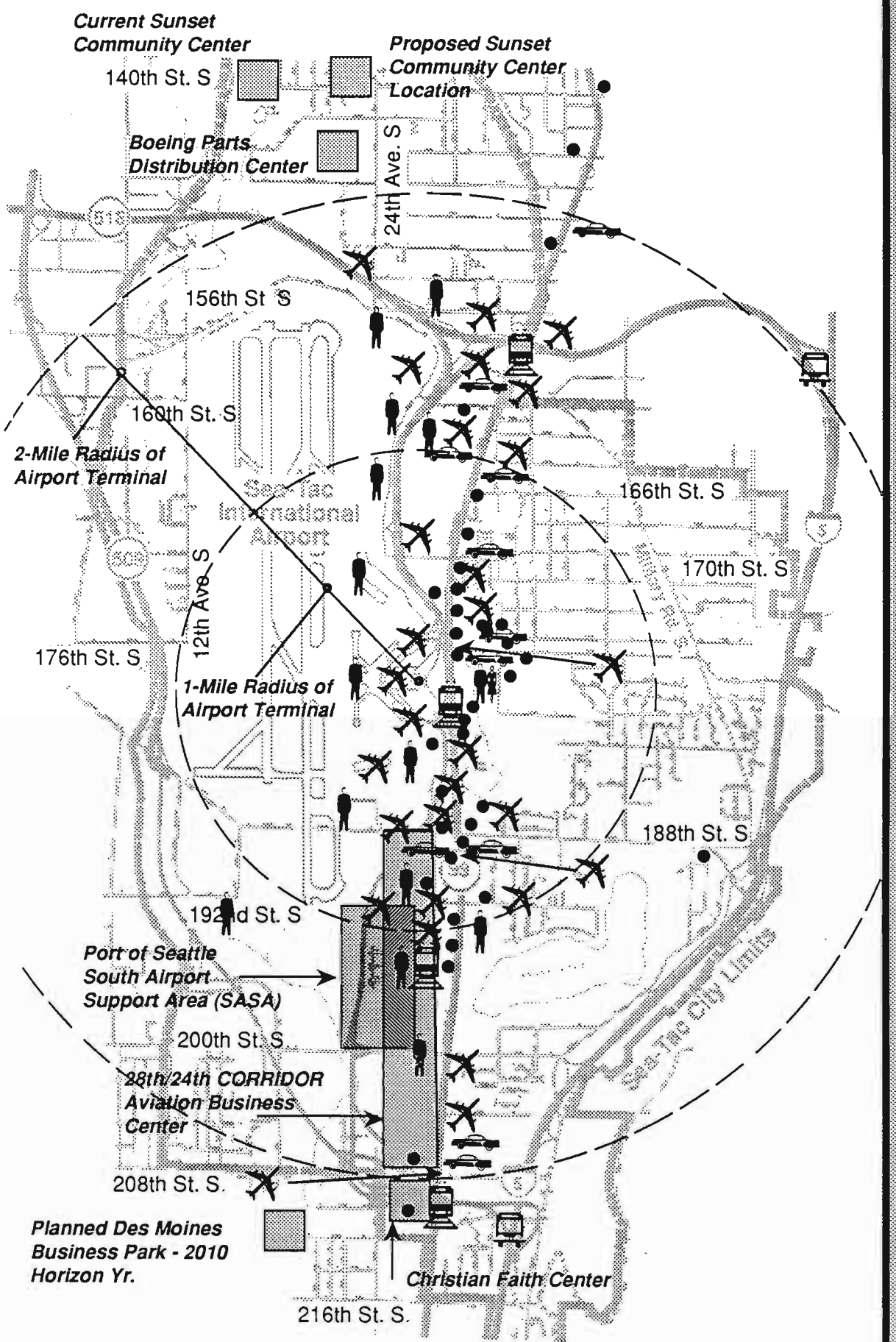
What is the transportation problem in the study area?

The problem in SeaTac occurs primarily during peak travel conditions. During these periods a lack of adequate transportation capacity exists where a collection of sporadic and inefficient transportation services which must satisfy a fast-growing demand for travel within the City. This is not only a problem in SeaTac but is a regional concern. More and more common is an extremely congested street system both along International Boulevard and within the Airport's curbside access roadways. Regional traffic is known to divert to International Boulevard from I-5 in order to avoid congested conditions on that facility. This further compounds the difficulties for local travel in SeaTac. Travel time within the city has become unpredictable during many hours, and it is commonplace for traffic to divert to alternative routes to bypass congestion. People must often allow long periods of time to travel short distances. The transportation deficiencies in the City and congested roadway system are a detriment to future development, and a significant factor in the degradation of the quality of life within the City. Traffic congestion is also a key factor in worsening air quality caused by combustion of fossil fuels.

Many of the existing hotels, rental car agencies and parking lots currently operate people movers in the form of a shuttle bus system. The Port of Seattle operates bus services to serve remote airport employee parking lots and airport usage is projected to dramatically increase. These services are exclusively oriented to each particular trip served, often operating as on-demand, origin-to-destination, services with no intermediate stops. The large number of independently operated shuttles exacerbates the roadway congestion, while many of the shuttles operate what could be considered to be overlapping and under-utilized services.

How are travel patterns expected to change?

Figure E-2 illustrates the complexity of travel patterns in SeaTac. The development of Metro's regional High Capacity Transit (HCT) system through the City in combination with continued air passenger increases and major office and commercial developments as part of the Aviation Business Center will influence these patterns and cause the need for greater local distribution of trips. While travel will still be heavily oriented to the Airport, additional focus will be placed on new development nodes, especially if the Aviation Business Center develops with 6 to 9 million square feet of development as proposed.



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Legend

- Proposed Development
- Proposed Metro Transitway Access Points
- Proposed Metro Rail Station
- Hotel/Motel
- Rental Car
- Airport Parking
- Major Employers:
  - Airport
  - Center

Composite of Possible Study Area Trip Generators

E-1

Approximate Scale

0' 1500' 3000'

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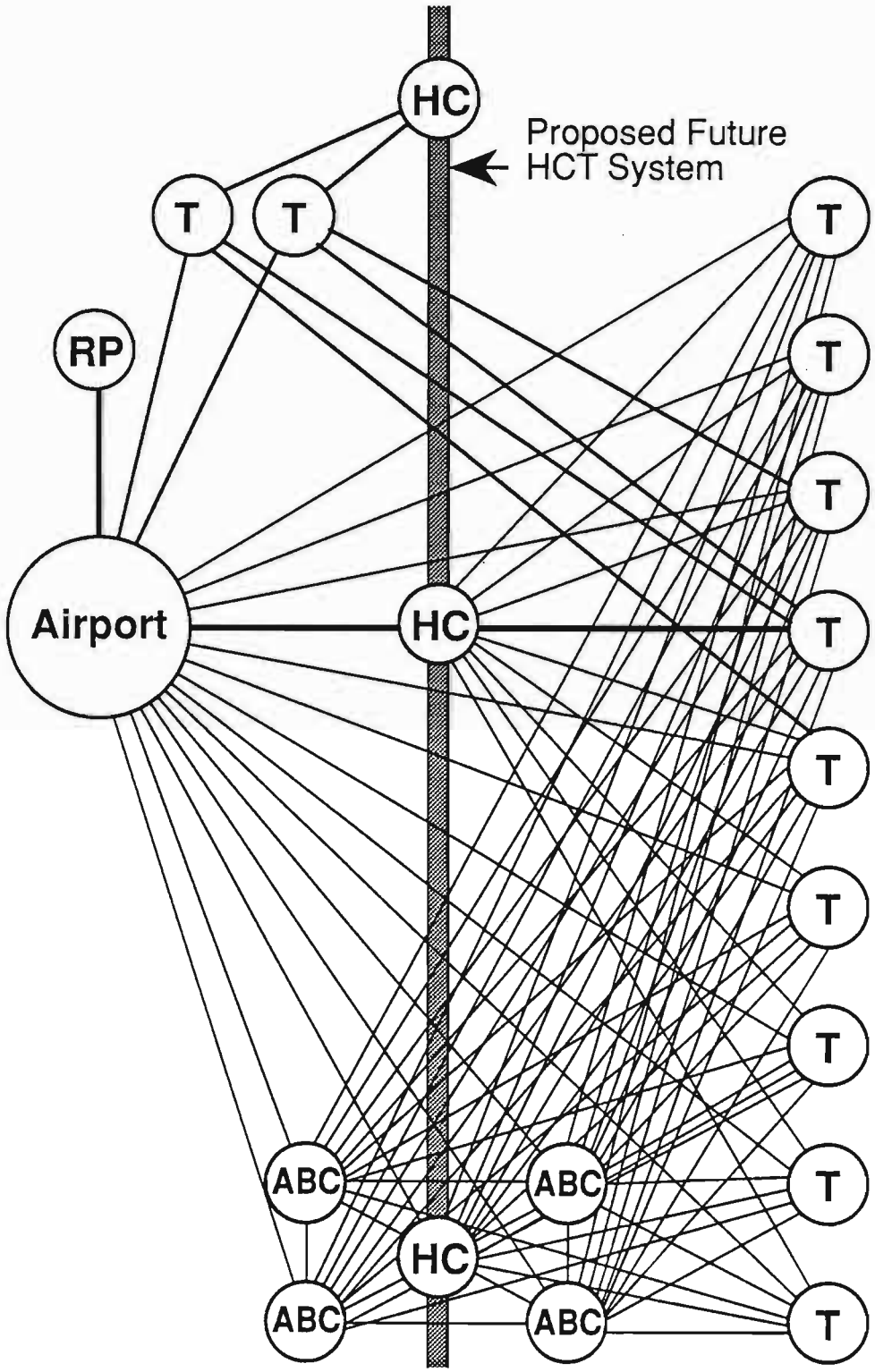
Map Source: City of SeaTac, 1991



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Legend

- T — Hotels, Remote Public Parking & Other Local Trip Generators
- RP — Remote Airport Employee Parking
- ABC — Major Nodes Within Proposed Aviation Business Center
- HC — Future Access Points to High Capacity Regional Transit System (HCT)

Concept of Future SeaTac Internal Travel Patterns

E-2

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TECHNOLOGIES AND ALTERNATIVES CONSIDERED

The Steering Committee has considered a wide range of technologies and alternatives for the People Mover System. Figure E-3 illustrates the range of technologies considered.

Bus: The people mover system that exists today in the City of SeaTac is a combination of privately operated shuttle bus services, Metro and Port operated bus services. The bus concept advanced in this study could include a change to joint operation controlled by a central dispatch facility. Bus systems are characterized by paid drivers operating rubber tired, self-propelled vehicles. Bus systems usually operate on the public street system in mixed-traffic flow. However, they can operate with preferential treatment at selected locations or on an exclusive reserved guideway. Buses come in a wide range of sizes and shapes as evidenced by the current combination of vehicles seen in the City of SeaTac today.

Light Rail Transit (LRT): LRT is an electric railway system characterized by its ability to operate as single cars or short trains along exclusive right-of-way at ground level, on an aerial structure, in subways, or occasionally, in streets and to board and discharge passengers at track level or at car-floor level (Source: TRB). During the early stages of the study the Steering Committee determined that this mode was not applicable for the internal distribution system in SeaTac and it was not analyzed in detail.

Group Rapid Transit (GRT): These systems serve groups of people with similar origins and destinations. Typically, they are part of a class of transportation systems in which unmanned vehicles are operated on fixed guideways along an exclusive right-of-way. GRT guideways may merge or divide into branch lines, but are most usually operated primarily as shuttles. Local examples are the Seattle Center Monorail (which is manually operated) and the Satellite Transit System (STS) which is an automated system in tunnels beneath Sea-Tac Airport. Both of these systems have operated for several years.

Personal Rapid Transit (PRT): PRT is defined by the Advanced Transit Association as having fully automated vehicles (i.e. without human drivers); vehicles are captive to the Guideway, which is reserved for the vehicles; small vehicles available for exclusive use by an individual or a small group traveling together by choice; small guideways that can be located above ground, at or near level ground, or underground; vehicles able to use all guideways and stations on a fully connected PRT network. It is envisioned to be developed as a network of guideways with personalized vehicles which are summoned for individual trips and provide non-stop, origin to destination service. This mode of transit is in the development phase, never having been implemented in public transit service to date.

PREFERRED ALTERNATIVE

What is recommended for development of the SeaTac People Mover System?

A combination of People Mover System technologies should be pursued in parallel.

1. Shuttle buses are expected to fill a people mover function at SeaTac for the "near-term" (at least five years) future. Improvements to their operation can occur relatively inexpensively to provide immediate benefits. Depending on the successful development of other technologies, shuttle bus access may continue to be the primary people mover mode for several years. Improvements suggested for SeaTac related to shuttle operations are discussed in the following section titled *Baseline Transportation Improvements.*

2. If it were available for application, the characteristics of PRT were found to respond most successfully to the needs for a people mover system in the City of SeaTac. PRT could replace many of the current shuttle operations with comparable or superior levels of service in many instances throughout the study area. No other alternative technology was found to be as responsive to the diverse internal trip-making needs between the various existing and future land uses in the study area. PRT, when it is technologically capable of development, will most closely respond to the on-demand, origin to destination, non-stop, personalized travel needs found in SeaTac.

3. The Port of Seattle may wish to consider the potential opportunity to develop a separate guideway system for service between the airport terminal and remote employee parking facilities. A system similar to the Satellite Transit System operating beneath the airport now would be a GRT shuttle, and could be developed on elevated guideway. It may fulfill the needs provided by a portion of a full PRT system. BRW recommends that the Port consider development of a GRT shuttle as a stand-alone system, within the context of the overall transportation development program in SeaTac.

4. The currently proposed regional rail system assumes a station for airport access which is beyond a reasonable walking distance from the terminal. Neither PRT nor GRT may be the appropriate mode to provide a connection between the rail station and terminal. Metro and the Port should further consider means to make this connection including moving walkways.

What are the benefits of PRT over other possible choices?

A PRT system would improve access and circulation and travel reliability for a substantial number of properties. PRT provides direct origin-to-destination transportation with minimum vehicle wait time. Compared to other choices, a PRT system provides the following benefits:

BUS

The Citiliner®

Diamond Coaches

LRT

San Diego *Light Rail Existing*

Portland MAX *Light Rail Existing*

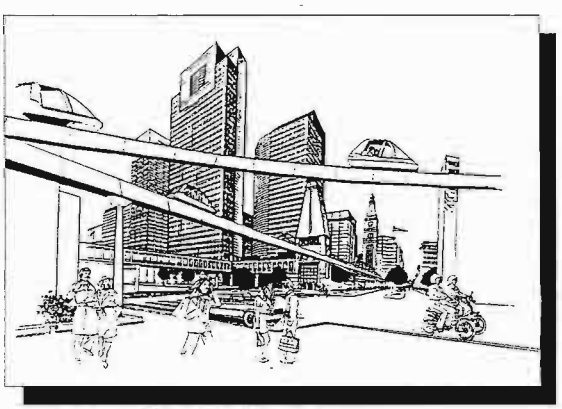
GRT

Las Colinas *AEG Westingouse Vehicle*

PRT

Cabintaxi® *Prototype PRT*

Seattle Monorail *Existing*



Taxi 2000® *Concept PRT*

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Technologies and Alternatives

E-3

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- Choice of Destinations. In the SeaTac area travel could occur between any two stations, thereby allowing the many-to-many scenario for distribution of trips.

- Travel Time. PRT potentially offers the fastest point to point travel time since it requires no intermediate stops. Wait times are minimal since vehicles are constantly circulating or waiting at off-line stations for passengers. Demand-responsive operation occurs at all times.

- Compatibility. Due to the smaller envelop for PRT, alignment and stations can be integrated into existing development and rights-of-way. Also, visual intrusion is not as great as more conventional rail or GRT options.

- Versatility. PRT can operate in a variety of restricted operating environments. The primary advantage is in geometric design, where tight radii curves and steeper grades can be accommodated.

Other advantages attributable to PRT are its potential to cause increased attractiveness of land for development and subsequent increased visibility and use. This improved access may ultimately lead to increased property values.

From the standpoint of private shuttle operators, PRT would best meet the needs of their clientele. Direct trips would be provided; service would be comparable to or better than that provided by current shuttles.

PRT SYSTEM COMPONENT

Where would PRT be located?

Figure E-4 shows a configuration of PRT Guideway development for comparative evaluation. As shown, it would provide service to most major destinations. As reduced system is possible which would incorporate a GRT shuttle as described above. Shown is a system with approximately seventeen lane-miles of one-way guideway. Each of the possible 31 stations are located on sections of "off-line" guideway, such that vehicles may bypass stations and never have to make intermediate stops between origin and destination of each personal trip. If pursued, the system would be likely to be developed in stages.

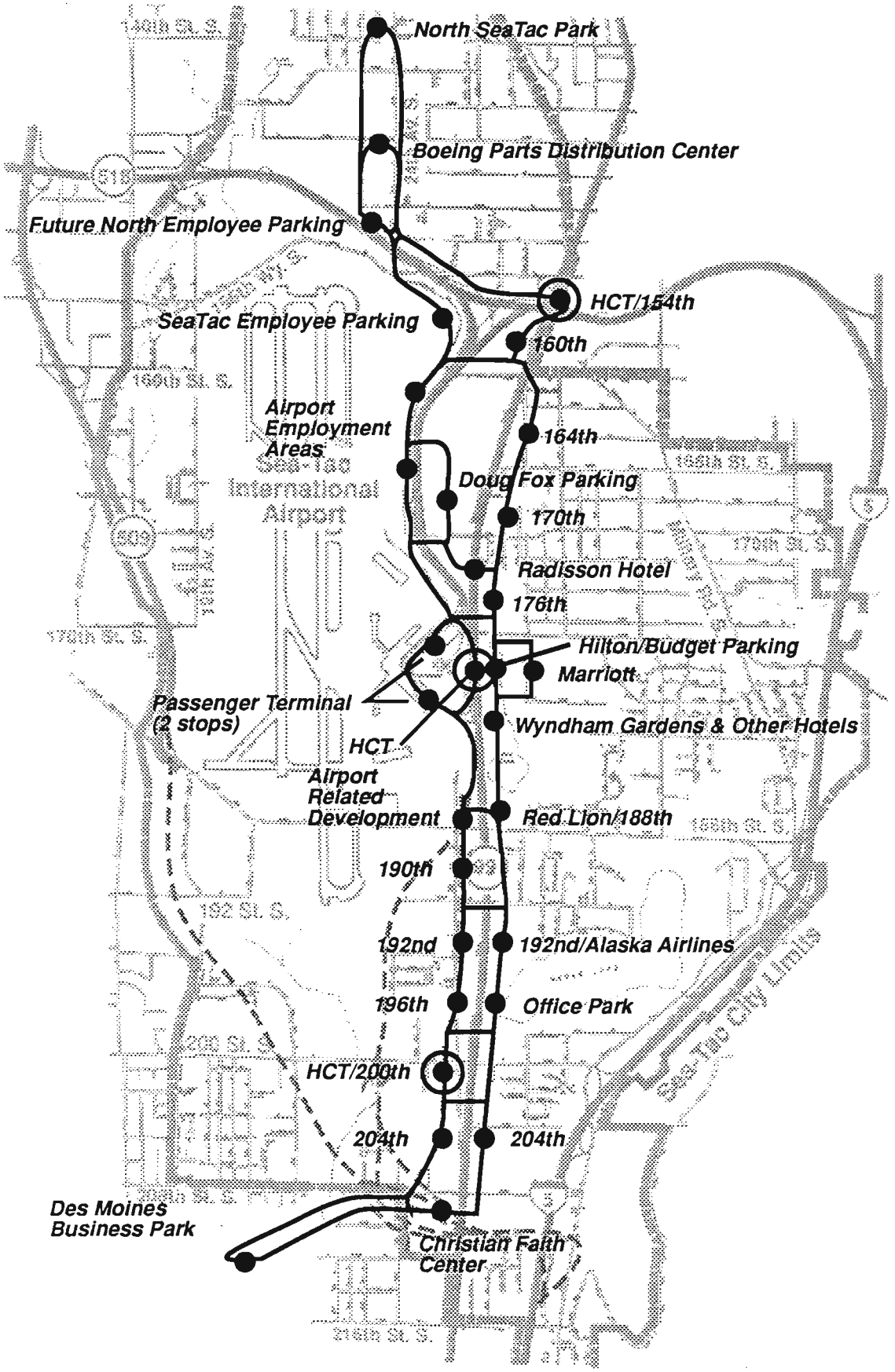
The system would consist entirely of elevated guideways located along street rights of way and integrating into developments and buildings wherever opportunities exist. In order to provide direct integration, some stations could penetrate directly into the lobbies of new or existing hotels, office buildings, and the Airport Terminal at Sea-Tac. This would provide some potential for shared pedestrian access and cost responsibilities. Some stations would be free-standing and require stairways and elevators for handicapped access.

What would PRT look like in SeaTac?

Figure E-5 shows representative examples of PRT concepts serving the SeaTac Red Lion Hotel and interfacing with Sea-Tac Airport Terminal. The hotel concept shows how a PRT guideway could be built back away from International Boulevard for service "direct to the door." The airport terminal concept shows an option for the PRT station above the upper level sidewalk directly serving the ticket lobby. This type of station development would greatly assist the system in reaching its potential.

How much would PRT cost to construct?

Since no current experience exists with this mode of transit, it is virtually impossible to provide a reliable cost estimate for construction. It has been suggested vehicles could cost as little as $45,000 each and that the guideway could be built for about $1.9 million per mile. These levels of cost are far below those of other automated guideway transit systems for which experience exists. Some potential risks and technology development costs have not been taken into account in those numbers. Alternatively, the 15+ mile PRT network shown could cost between $195 and $315 million, if the assumption is made that guideway and vehicle costs are somewhat higher. The Steering Committee has assumed the $195 million level of expenditure for purposes of feasibility assessment. As the technology is further analyzed and developed more definitive cost information will become available, prior to the commitment of funds to construct such a project. Table E-1 illustrates three levels of PRT system costs. Mid to Moderate range of cost is recommended for planning purposes. In contrast, the GRT alternative was estimated to cost $210 to $290 million, while the bus alternative was estimated to cost $3.3 million.



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Legend

- PRT One-Way Guideway
- Possible PRT Station
- Possible Interface with Metro HCT Rail Station
- South Access Area Recommended Roadway Improvements (by others)

Note: Stations are conceptually located to provide best reasonable access to/from the vicinities indicated.

PRT Alternative for Comparative Evaluation

E-4

Approximate Scale

0' 1500' 3000'

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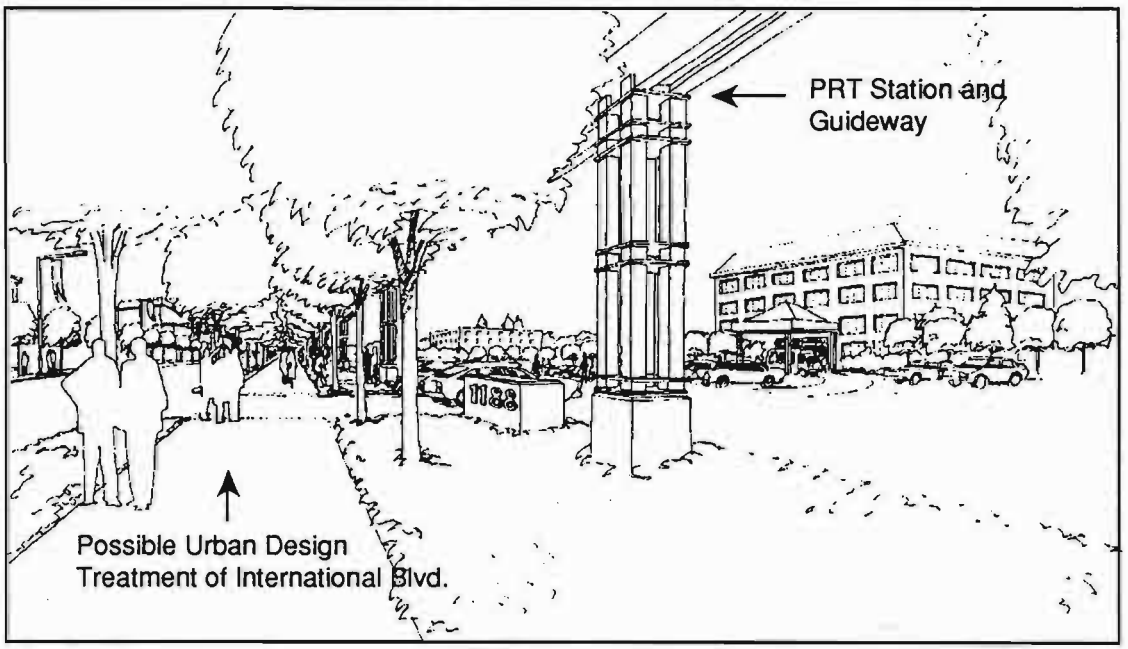
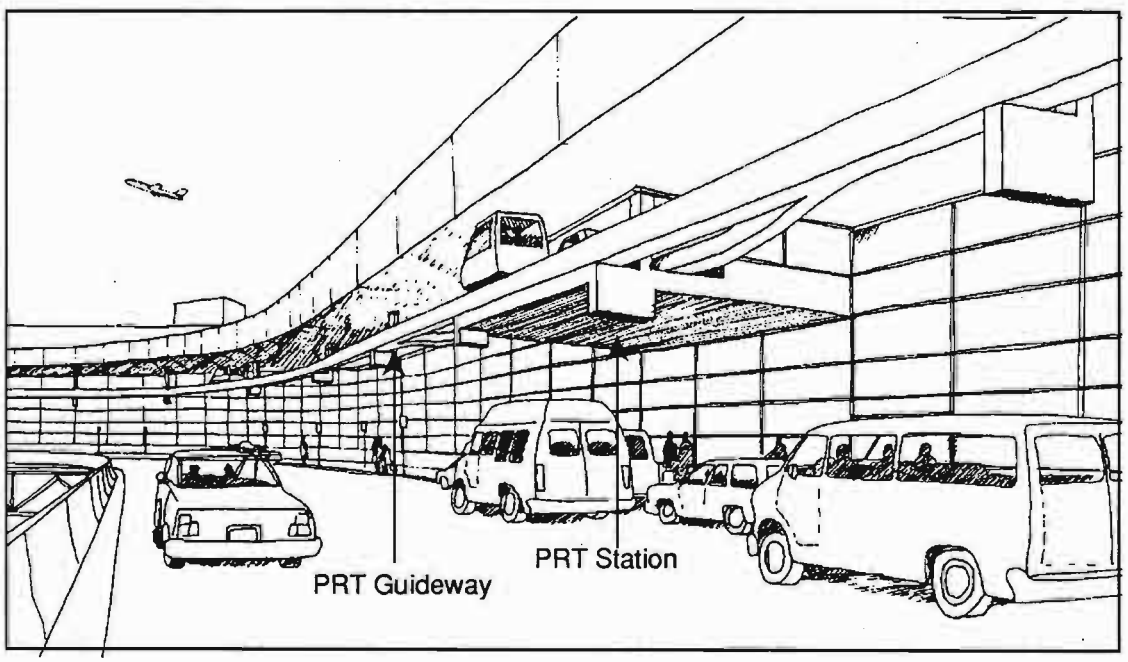
Map Source: City of SeaTac, 1991



Rendering of Figure 3-21 (p.3-33)



Sea-Tac Airport PRT View (from upper Terminal Departure Roadway)

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Concepts of PRT Station Locations in Sea-Tac

E-5

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ZIMMER•GUNSUL•FRASCA PARTNERSHIP

Table E-1
PRT Cost Estimate Summary
(millions of 1991 dollars)

	Low	Mid-Range	Moderate
Guideway (17 lane miles)	$32.7[1]	$50.0	$75.0
Stations (31)	$8.3[1]	$15.0	$20.0
Vehicles (260)	$11.5[1]	$24.0	$48.0
Maintenance & Control	$1.8[1]	$4.0	$8.0
Subtotal	$54.3	$93.0	$151.0
Contingency (60%)[2]	$32.5	$55.8	$90.6
Engineering/Administration (31%)[3]	$26.9	$46.1	$74.9
Total	$113.7	$194.9	$316.5

1 Base data provided by current developer of technology

2 Contingency allowing some development costs. Note this level of contingency is assumed higher for PRT than for other alternatives considered since the technology is still under development. all alternatives included a contingency in the capital cost estimates.

3 Based on current Metro practice.

How much would PRT cost to operate and maintain?

A potential developer of PRT has estimated a cost to operate and maintain the SeaTac PRT System to be approximately 12.9¢ per passenger mile. This estimate was developed by one of the PRT technology developers based on their studies. It is noted that it is quite low when compared to operating costs for other modes currently in use. Based on this unit cost, annual operating cost is estimated to be $2.8 million, (1991 $). This includes vehicle cleaning and daily testing, regular scheduled maintenance, station cleaning, guideway cleaning and maintenance, system management and administration. Not included are any special costs for security on platforms and landscape maintenance. Caution is warranted in the recognition that conceptual operating costs are often vastly underestimated for new and unproven transit technologies.

How many people would use a PRT system today and in year 2010?

It has been estimated that as many as 30,000 riders per day could use the PRT system shown by the year 2010. It is noted, however, this level of riderships based on a variety of critical assumptions, including:

- No competing shuttle services would be provided in the study area.

- Full development of the Aviation Business Center to 9 million square feet of development
- 5,000 riders per day using the PRT system to access the airport terminal from a nearby HCT Rail station.

The following table illustrates the sources of potential PRT ridership. If the entire system existed today, it was estimated that it would carry 11,500 daily riders based on current land uses.

Table E-2
Sources of PRT Patronage

Patronage Category	Daily Riders	Percent of Total
Hotels	10,200	34 %
Employee Parking Lots	4,700	16 %
Passenger Parking Lots	600	2 %
Future Employment Centers	4,800	16 %
HCT Transfer (Including 5,000 at Airport)	7,000	23 %
Air Passenger Induced Trips *	1,000	3 %
All Other	1,700	6 %
Total	30,000	100 %

* Recreational Riders from the airport

What is the developmental status of PRT?

PRT is not an existing, available technology today. The most active, known PRT development project at present is that of the RTA in Chicago. This project is just past the halfway point of Phase I, System Design. Two system design contractors, Stone & Webster/Taxi 2000 and Intamin, are performing design and analysis of their proposed technologies towards the goal of convincing RTA and its support team that PRT can be deployed with a high probability of success. If convinced, the RTA will proceed to Phase II with the best of the two designs. Phase II is planned as a two-year effort, concluding with formal tests to demonstrate system performance on a test track. Thus, the concept of PRT appears to be on the threshold of a critical and significant period of development. The operation of PRT on a test track would begin to answer the questions of performance, safety, reliability, and cost so often raised by transportation professionals. A third phase would include demonstration deployment in a suburb of Chicago.

What is the schedule for the experimental PRT program in Chicago?

The implementation schedule for PRT in the Chicago area is in Figure E-6. As shown, the project is divided into three phases and will be completed according to the following schedule:

•	Phase 1	System Design	1991
•	Phase 2	Development and Test	1992 - 1994
•	Phase 3	Demonstration Site Deployment	1994 - 1995

Demonstration system operation is scheduled to begin in 1996.

How would the PRT System relate to other transit modes?

PRT would serve as a distributor or feeder for the planned HCT service and other Metro service within the SeaTac area. It would provide direct access from the Sea-Tac Airport HCT station to the main terminal. Other primary intermodal transfer points between PRT, HCT and Metro would be the planned 154th and 200th HCT stations. Additional transfer opportunities between PRT and Metro would also occur along International Boulevard. On closer and convenient access to many destinations, additional trips could be induced for Metro and for the future HCT due to the increase in destinations available through the PRT system. To ensure the greatest possible use and overall efficiency between modes, it is important that fare structures be interchangeable, transfer access be convenient and use of the system easy to understand.

Is the PRT system feasible?

PRT system feasibility is assessed against the following three items:

- Service Provided - Demand responsive, direct origin-destination, automated, and private party service is the service currently provided and preferred to serve the SeaTac area travel patterns and is the service provided by PRT technology.

- Financial - If the patronage projections are correct and the actual costs are consistent with the estimated costs, the cost/rider is reasonable.

- Technical - PRT technology is currently not a proven technology; work is underway which may or may not change this situation.

If available, PRT service could be feasible to serve the major people mover needs of the study area. PRT's technological feasibility remains to be proven.

What threshold of development justifies PRT?

An analysis was performed to consider the required cost per passenger in order for the system to be implemented and operated. Increasing ridership will produce lower cost per passenger, provided that operating and maintenance costs remain stable.

This analysis produced an estimate of cost per passenger ride in the range of $2 to $4 per ride for various configuration options. This level of cost is quite low as compared to that of urban public transit systems today. This indicates that PRT development could be justified if the various assumptions of the analysis prove correct. However, before implementation timing can be responsibly established, more refined analysis in these areas is needed:

- More reliable capital and operating cost estimates must be developed as more information on which to base them becomes available.

- Substantial analysis of potential ridership must continue in order to more firmly establish the level of system usage.

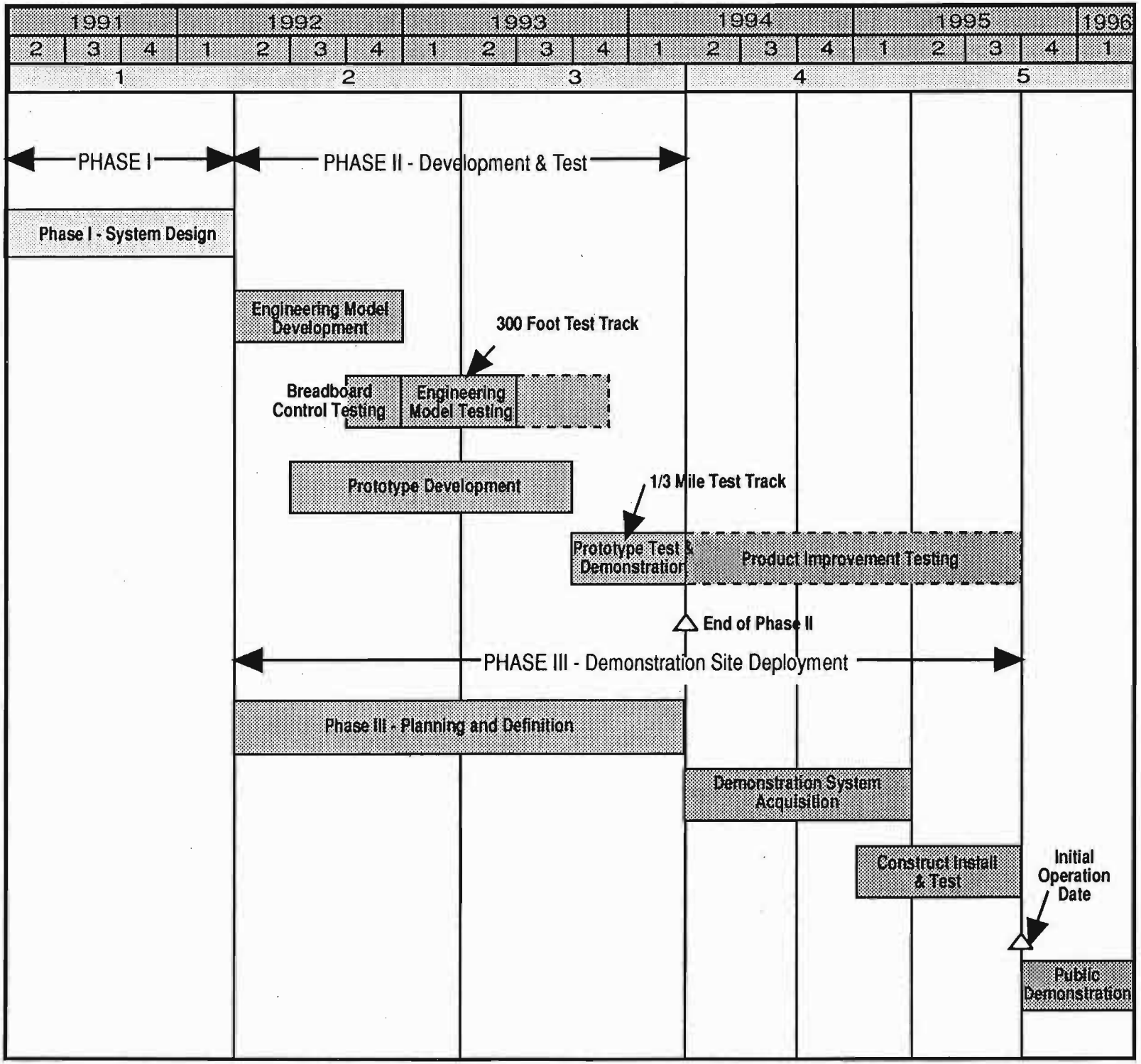
- The pace and intensity of land development in SeaTac must be analyzed in more detail on the basis of current airport development assumptions and local area market analysis.

- The pace of technology availability must be continually monitored to determine if and when PRT can reasonably be made available.

During future consideration the affected parties will need to consider what level of subsidy can be justified on the basis of benefits provided by the system. Cost effectiveness of the system will vary considerably if an attempt is made to optimize its configuration to serve developed land uses.

EVALUATION SUMMARY

A summary of key comparative criteria is noted in Table E-3 for people mover alternatives. Qualitative ratings are Excellent, Good, Average and Marginal, with "Excellent" representing the most positive aspect and "Marginal" the least positive.



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Implementation Schedule for Chicago RTA PRT System Demonstration

E-6

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Source: W.M. Wilde

Table E-3
Summary of Key Criteria

	BUS	PRT	GRT
Capital Cost (millions of 1991 $s)	$3.3	$195 *	$210
Annual Operating Cost (millions of $)	$9.3	$2.8	$1.3
Possible Daily Ridership (2010)	18,600	30,000	23,500
Cost Per Passenger Ride (Includes annualized capital and O&M costs)	$1.44	$1.85	$2.35
Effect on Air Quality	Small Positive Contribution	Small Positive Contribution	Small Positive Contribution
Revenue Availability	Good	Marginal	Marginal
Lane Miles of Guideway	-	17	10
Number of Stations	-	31	16
Peak Vehicle Requirements	25	263	22
Airport Terminal Interface	Good	Good to Excellent	Good
Expandability	Excellent	Good	Marginal
Travel and Wait Time	Marginal to Good	Excellent	Good
Compatibility with the "Built" Environment	Average	Good	Average
Routing Flexibility	Excellent	Good	Marginal
Geometric Restrictions	Good	Good	Average
Technology Status	In common use	Under development	In common use
Transit Service			
• To remote airport employee parking	Good	Good	Excellent
• HCT to airport terminal (applicability)	Marginal	Good	Very Good
• General SeaTac origins/destinations	Good	Excellent	Marginal
• Reliability	Marginal	Very Good	Very Good

* Note: PRT cost base information is being refined by analysis currently underway for Chicago's RTA. A better base from which to estimate PRT cost is expected to emerge as the Chicago development progresses.

BASELINE TRANSPORTATION IMPROVEMENTS

What other interim transportation improvements should be made?

A variety of bus-related improvements are proposed in the short-term within the City of SeaTac. They can be implemented at relatively low capital cost and without technology development studies. These are intended to provide immediate benefits to the operation of shuttles and transit in the City irrespective of long-term automated guideway system proposals.

Baseline transportation improvements would reduce somewhat the traffic congestion along internal airport roadways and streets frequently congested due to airport traffic and frequent I-5 traffic diversions. These improvements include:

- priority treatments for high-occupancy or other authorized vehicles
- a shuttle terminal with designated pick-up/drop-off areas
- pedestrian and urban design enhancements.

Table E-4 lists these improvements and implementation responsibility.

Table E-4
Baseline Transportation Improvements Development Responsibilities

Stage I Projects	Responsibility
Priority Treatments	City of SeaTac
HOV Lanes	"
Queue Bypass Lanes	"
Left Turn Priority	"
Shuttle Terminal	Port of Seattle
Pedestrian/Urban Design Enhancements	City of SeaTac & WSDOT

HOV lanes, queue bypass lanes, and left turn priority would be implemented along International Boulevard and South 188th Street to speed operation and access into the airport.

A shuttle terminal would provide designated stops for all courtesy vehicles within the Sea–Tac parking structure or at another selected location, thereby reducing congestion on the arrivals roadway. Due to limited available clearance in the structure, most current shuttle vehicles would require replacement with lower profile van–type vehicles in order to use a facility in the parking structure.

Central dispatch could be used to coordinate flow of courtesy vehicles through the airport based on demand. Courtesy vehicles would wait at a staging area until summoned.

Pedestrian and urban design enhancements are currently under study which would allow more convenient and direct access to transit. Planned infrastructure improvements include sidewalks, transit wait areas, lighting and weather protection.

How much would baseline transportation improvements cost to construct?

The cost of these improvements depends heavily on the level of urban design treatment that is included for the International Boulevard corridor. With a minimum level of urban design, these improvements have been estimated to cost $5.4 million in current dollars, not including costs for right–of–way acquisition.

How do baseline transportation improvements relate to a possible future PRT System?

Baseline transportation improvements can be implemented without PRT. These allow more efficient surface transport by shuttles, taxis and buses. In the longer term and after implementation of PRT, these improvements will still be needed. They will allow intermodal transfers to occur at any PRT stations, as well as between remaining shuttles, taxis or other paratransit services.

GRT SHUTTLE COMPONENT

Why should a GRT shuttle be considered with or without PRT?

The Port of Seattle plans to relocate most remote parking for airport employees to a site north of SR 518 and west of 24th Avenue South. Capacity at the site exists for a large amount of surface parking and forecasts indicate approximately 5,000 daily person–trips will be made between this site and the airport terminal area. While a fully–developed PRT system may be able to meet this demand, a line–haul shuttle system may be most suited to this type of travel.

How does the cost of a GRT shuttle compare with shuttle buses?

A simple GRT shuttle between the future remote airport employer parking facility and the airport terminal may cost in the range of $38 to $45 million to construct, but it may only cost $300,000 per year in operating costs. The current shuttle bus system the Port operates for airport employees costs about $850,000 per year to operate. While it may be difficult to entirely offset the capital costs of such a system, the travel time and reliability benefits of a GRT shuttle may warrant its further consideration.

How would a GRT shuttle relate to PRT?

If both systems were to be developed, it is likely they would largely be independent. The GRT shuttle would serve airport employee parking needs while PRT would serve other SeaTac local circulation needs. A reduced PRT network in concert with a GRT shuttle may be more likely than the full PRT network shown previously. Such a combination system concept is shown in Figure E–7.

FINANCING THE IMPROVEMENTS AND OPERATION

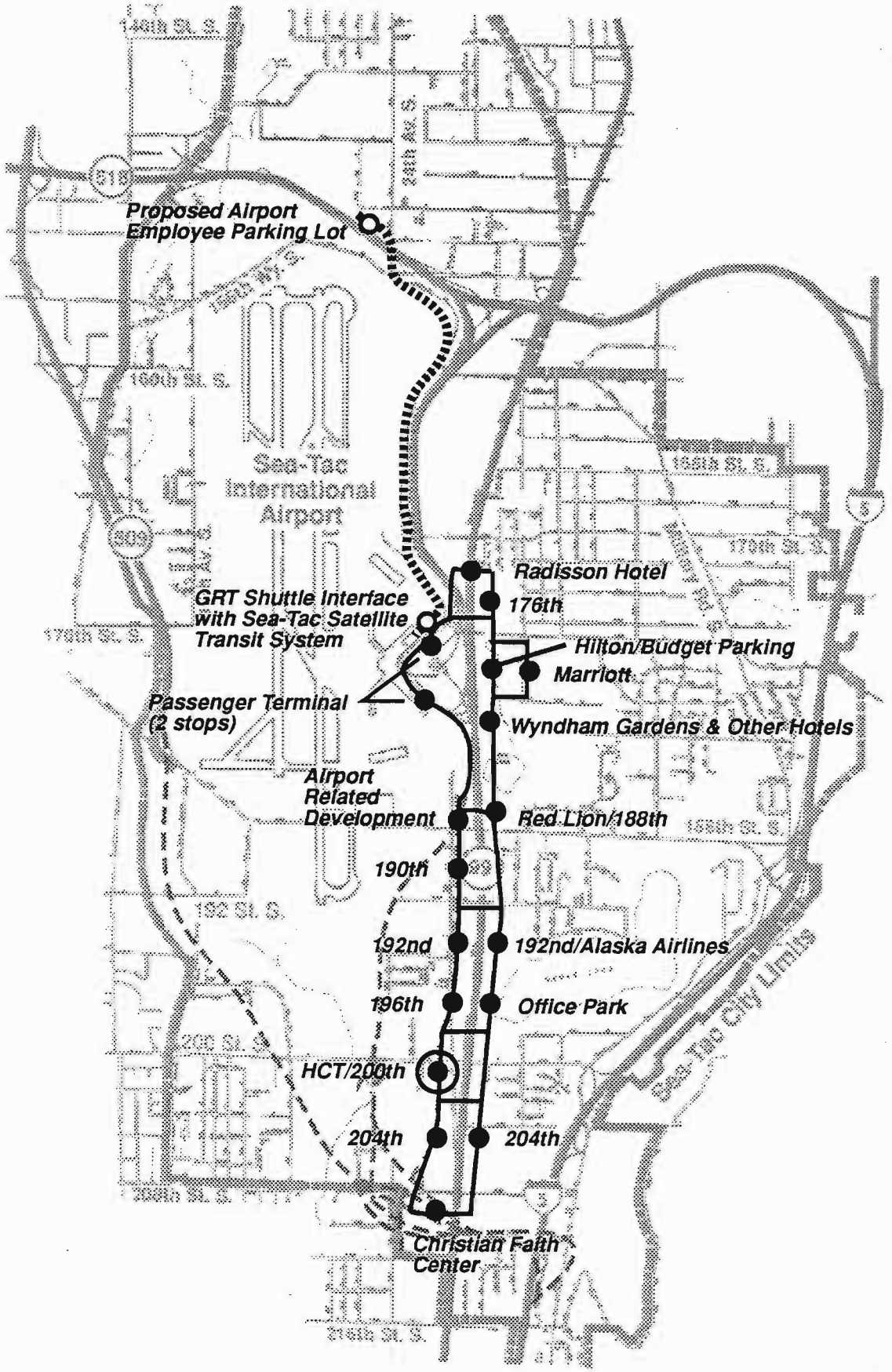
How could the construction cost of the system be paid?

The SeaTac people mover should be viewed as providing benefits to users on multiple levels: the individual property level, the Port of Seattle level with its service to airlines and to passengers, the City of SeaTac level with its area–wide benefit to citizens, property owners and businesses, and finally the level of the regional transportation network providing linkage between major activity centers and the airport. Each of these beneficiaries should be expected to make a contribution toward the funding of the people mover, and each entity's contribution should be commensurate with the level of benefit it receives.

This study did not attempt to determine the relative level of benefit accruing to each of the system beneficiaries. Such an allocation must be the product of detailed internal analysis by each participating entity, followed by significant discussion among the parties. Instead, this analysis focused on identification of a conceptual capital funding approach, which suggests likely funding sources, and the relative level of such funding.

Candidate funding sources for the PRT include:

- Property owners via Local Improvement District, joint development agreements and donations



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Legend

- PRT One-Way Guideway
- Possible PRT Station
- Possible GRT Shuttle
- Possible Station for GRT Shuttle Service Between Airport and Remote Employee Parking
- HCT Rail Interface with PRT
- Possible roadway improvements by others

Note: Stations are conceptually located to provide best reasonable access to/from the vicinities indicated.

"Reduced" PRT System with GRT Shuttle

E-7

Approximate Scale

0' 1500' 3000'

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Map Source: City of SeaTac, 1991

- City of SeaTac via voter-approved General Obligation bonds and commercial parking tax revenues

- Metro or King County regional government via sales tax and Motor Vehicle Excise Taxes

- Port of Seattle via airline fees and passenger facility charges

How could operations costs be covered?

Assuming a $.50 fare, annual operating revenues received by the PRT system would be about $5 million per year. This would more than cover the currently suggested operating cost of the system. It is noted that no US public transit operation currently covers the entire cost of its operation from fares alone. Less optimistic operating costs and patronage estimates may alter this conclusion. There are a variety of methods by which these operating revenues could be collected. Such methods include payments in lieu of fares from the City, the Port, and/or hotel and parking lot operators; user fees in the form of coupons or farebox debit cards; and cash fares.

It has been estimated that the Port and private hotel, car rental and parking operators in the SeaTac area spend in the range of $6 to $12 million per year on the present shuttle van system. With some portion of these users switching to a PRT system, the savings from the operation of shuttle vans could be directed to a people mover operating and maintenance fund. Properties located at or near stations, in particular, could be expected to make contributions in lieu of fares.

Key issues in evaluating the appropriate mix of operating cost recovery methods are the logistics of fare collection, and the history of free shuttle service in the SeaTac area. Given that the current shuttle van service is free of charge to users, it may be appropriate to focus on indirect revenue collection methods, i.e. those which do not require riders to deposit cash on an individual ride basis.

IMPLEMENTATION STRATEGY

What are the next steps in Program?

Figure E-8 presents the next steps in the program to improve transit services in the project study area. The program is divided into five areas:

- PRT People Mover System

- Airport HOV Access and Terminal Facility

- GRT Shuttle for Airport Employee Access

- Transit Services

- Coordination with Related Programs

As was discussed in previous sections, of the technologies considered, PRT with its direct, origin to destination service, provides the best fit with the diverse travel needs of the SeaTac area. However, because the technology is not fully developed, the PRT component of the recommended plan presents a particular issue of implementation strategy for the participating organizations. The issue boils down to one of how much money should be put at risk, recognizing that the development of PRT could fail at some point.

If the choice were to take little or no risk, then implementation of the SeaTac PRT system should not proceed until the technology has been successfully demonstrated in public service. If the Chicago program proceeds as planned, that would be sometime in late 1996. Under this conservative approach, no significant funds would be expended on detailed planning, design, environmental review, or construction until that time.

If, on the other hand, the financing partners for the SeaTac People Mover were willing to undertake some risk, more detailed planning and design, or even local test and demonstration on a test track could proceed, with early steps beginning in 1992. That would have to be done with the understanding that funds expended would be at risk, should the technology's development not proceed to a satisfactory conclusions. *It is the Steering Committee's recommendation that the issue be discussed over the next months by the participating parties.*

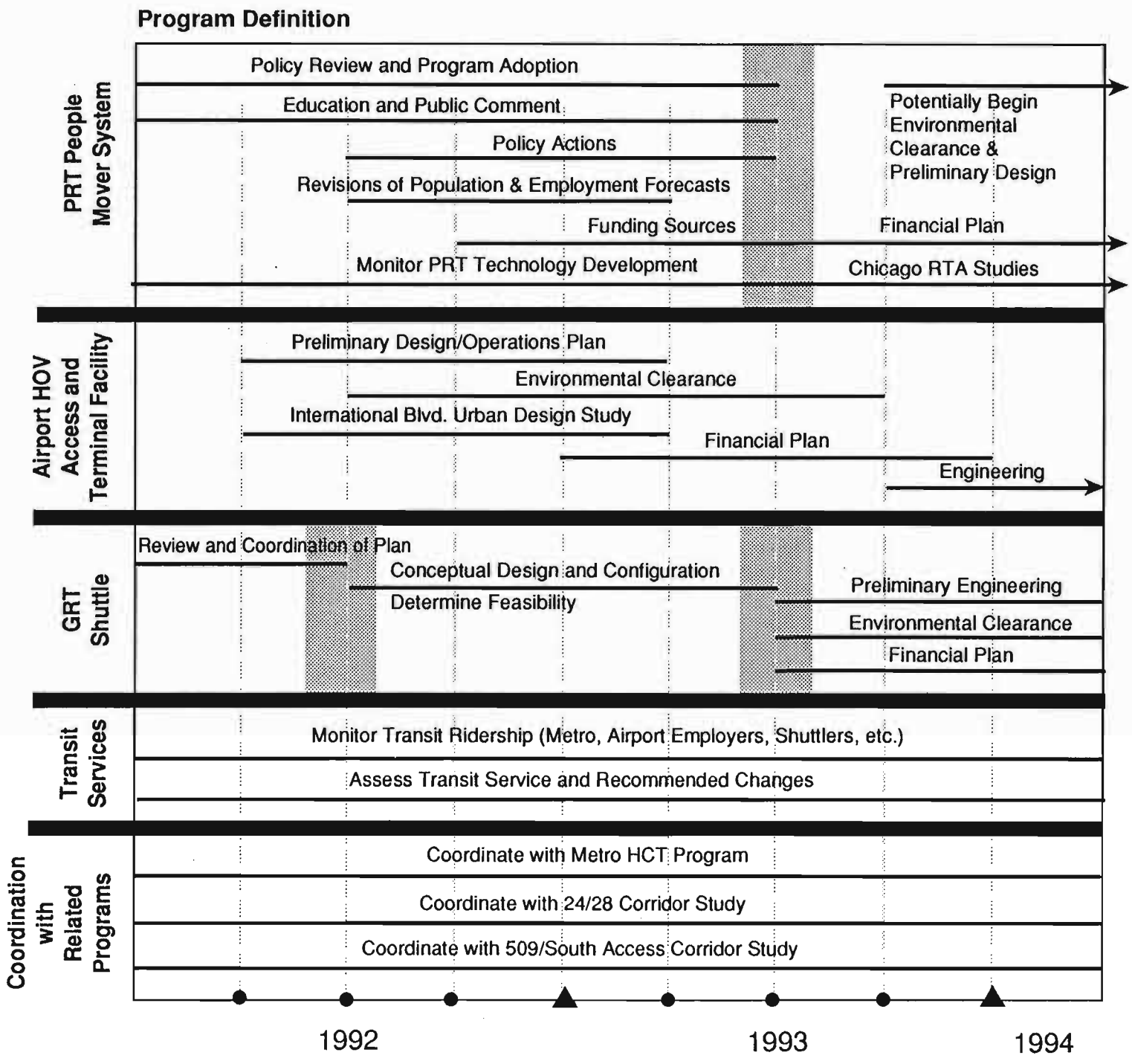
Time for dealing with this and other issues is included in an overall course of action leading to the implementation of the recommended program. This course of action has four major components:

I. Program Adoption. This first phase would take place over the next 12 to 18 months. Its objective will be to develop an understanding of the program among the elected officials and executives of the participating organizations, and an understanding by the public in the SeaTac community. It is in this phase that the issue of how much risk to undertake with the PRT system should be decided. This important next phase is described in more detail below.

II. Program Design. This will complete the environmental and system design work and the financial plan.

III. Construction. This step will complete the construction, testing and acceptance of the systems.

IV. Operation. The systems enter public service in this phase.



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Legend

Indicates flexible start time of design activities to be determined

Overview of Major Work Tasks for Next Phase of SeaTac People Mover Program

E-8

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The schedule for these last three phases will vary among system components and will depend upon decisions made during the first, Program Adoption, phase. improvements to the bus system, for example, can happen more quickly than the PRT.

The remainder of this section focuses on the important activities of the 12 to 18 month Program Adoption Phase. The major tasks for this phase are:

1. Education – Develop an understanding of the project and a level of confidence in it by everyone who would be asked to financially contribute to it and by SeaTac residents and employers. Specific groups to target for more education and approval include:

    - Metro Council
    - Port Commission
    - Airlines and airport users
    - SeaTac and Des Moines City Council
    - Washington State Legislators and Department of Transportation
    - Hoteliers
    - Park & Fly operators
    - Off–airport rental car agencies
    - King County Council
    - Federal agencies including the Urban Mass Transit Administration

2. Policy Actions – Getting policies in place to support the ridership and construction of PRT. These include:

    - Acceptance of development risk (as discussed above)
    - Restricting parking supply
    - Encouraging remote parking
    - Designing guidelines for incorporating PRT stations and alignments into private right–of–way and developments
    - Restricting private shuttles from the airport drives

- Encouraging sidewalks and other "pedestrian friendly" improvements along International Boulevard and other major spines of development activity
- Defining priorities for airport user fees
- Defining priorities for the SeaTac People Mover in the regional Transit Project System Plan
- Defining commitment to using the commercial parking tax.
- Encouraging sidewalks and other "pedestrian friendly" improvements along International Boulevard and other major spines of development activity
- Defining priorities for airport user fees
- Defining priorities for the SeaTac People Mover in the Regional Transit Project System Plan
- Defining commitment to using the commercial parking tax

3. Population and Employment Forecasts – Revising earlier forecasts of 9 million square feet of development to reflect new SASA proposal, Regional Justice Center, North SeaTac development, among others. This will require revising ridership forecasts to reflect changes in assumptions.

4. Funding Sources – Seek better indication of the feasibility of obtaining funding. This will require a variety of methods of research and initial commitments, if possible from such sources as:
   - Surface Transportation Act
   - Regional Transit Project funds
   - Airport user fees
   - Commercial parking taxes
   - Private resources (including special benefit assessments)

5. Technology Development Progress – Continue to refine costs of PRT as new information develops. Also confirm feasibility of PRT application resulting from demonstration work conducted by Chicago RTA.

6. Integration with overall planning for the City of SeaTac and with Metro's overall Regional Transportation System Plan.

What should the governance structure be for the implementation program?

The preferred governance structure for the implementation of the People Mover is similar for the different stages of the project. Figure E-9 presents the relationship of the governance plan to the stages of the People Mover Implementation Process. For the current Feasibility Study Metro provided the lead in a partnership arrangement with the City of SeaTac, King County, Port of Seattle, and the Private Sector. This form of governance is recommended for the next phase of PRT development, requiring revisions in the interlocal agreement among the involved agencies to further define roles. For the construction and testing/acceptance phase of the PRT component it is recommended that an Interlocal Agreement be continued and further refined. The agreement would identify roles/responsibilities, financial obligations, uses/liabilities, approvals, etc.

What roles should various participants have in implementation of the people mover system?

Table E-5 shows suggested roles of both agency and private sector participants during implementation of the various components of the people mover system. In addition to those shown, WSDOT and King County may continue to play roles in funding and policy advancement.

Table E-5
Roles of Participants

Metro	Program Management
	System Operation
	Financial Participation
	HCT Interfaces
City of SeaTac	Regulate Development
	Parking Policies
	Roadway Improvements
	Urban Design Treatments
	Financial Participation
Port of Seattle	Airport Terminal Interfaces
	Consider possible GRT Shuttle for Airport Employee Parking
	Financial Participation
	Continue to Manage Airport Bus Shuttle Operations
Private Sector	Development Coordination
	Provide Easements and Pedestrian Interfaces with PRT
	Make Shuttle Operation Changes in Support of PRT
	Financial Participation

What if the PRT technology development program is abandoned in Chicago?

If the PRT Technology Development Program is abandoned in the Chicago area due to non-technical reasons, the SeaTac People Mover system presents an opportunity to serve as the pilot site. In this situation the SeaTac project and the related public agencies/private sector could potentially serve the role as a client for the system. The specifics of the legal, financial and technology ownership rights would have to be negotiated.

What if PRT technology is not developed and available for the SeaTac area?

If the PRT technology is not available for the SeaTac area, the transit services for the hotel/motel, car rental and park-and-fly operations will likely continue to be provided by private shuttle operations because of the diverse origins and destinations and relatively low volume of users from any one facility. For trips between the Airport and remote employee parking, HCT station, and Aviation Business Center (6 to 9 million square feet), a Group Rapid Transit (GRT) system may be feasible, subject to further consideration.

Stage of Project	Feasibility Study	Policy Review & Plan Adoption	Engineering/ Environmental Financial Plan	Construction and Testing/ Acceptance	Operation
Governance					
• **Lead**	Interlocal Agreement Metro	Interlocal Agreement Metro	Interlocal Agreement Metro	Interlocal Agreement Metro	Metro
• **Participants ****	City of SeaTac Port of Seattle Private Sector *	City of SeaTac Metro Port of Seattle WSDOT King County Private Sector *	City of SeaTac Port of Seattle Private Sector *	City of SeaTac Metro Port of Seattle Private Sector *	Private Sector * Pass Under Contract

* Refers to Land Owners, Tenants, and Land Developers

** Minumum participants shown may also include King County, State of Washington and others

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Relationship of Governance Plan to the Stages of PRT System Implementation Process

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