IV. INTELLIGENT TRANSPORTATION SYSTEM PLANNING

The use of ITS is another example of capital improvement programs which could enhance park-and-ride programs. The use of ITS to benefit park-and-ride utilization, system efficiency, and security have been evaluated at the corridor level. Two basic ITS system components were identified as having potential to provide corridor benefits. The first is a system of video surveillance cameras similar to those immediately located along major freeway corridors in the Puget Sound region. These cameras could enhance safety at park-and-rides by allowing centralized observation and recording of activities at selected lots. The second ITS improvement considered was a system of informational signs to display real-time available capacity at park-and-ride lots within a corridor. These signs would give potential users information regarding space availability at park-and-ride lots that serve the primary commuting corridors in the region.

Concepts utilizing ITS technologies for the four-county area are included in the overall park-and-ride cost estimates, and are described in detail below. Please note that the ITS program was developed at a planning capital facilities level, and does not include discussion of responsibility for, or operating costs of, monitoring, operations, and maintenance.

CCTV SURVEILLANCE SYSTEM

Security can be compromised at park-and-ride facilities due to lack of all-day activity and poor visibility from adjacent land uses. One approach to improving security at park-and-rides is to implement a system of closed-circuit television (CCTV) cameras to provide video monitoring from a centralized location. The implementation and operation of CCTV cameras at park-and-ride lots would be similar to that for traffic cameras operated by WSDOT on selected freeway corridors in the Puget Sound region. The CCTV system would rely on existing fiber optic networks established along freeway corridors to relay video information to a central control center. Kitsap County lots were not considered because the fiber optic network necessary to support the video surveillance system does not exist.

To estimate the cost of implementing CCTV surveillance, a unit cost for camera implementation based on detailed cost estimates generated for other local projects was developed. The unit cost per camera was estimated at around $67,000, which includes the equipment and installation typically necessary to connect a remote CCTV camera to an existing fiber optic network (at an average distance of ½ mile). These cost estimates assume a single camera implementation at all locations. However, the cost estimates can easily be recalculated should park-and-rides be identified that need additional cameras.

Corridor cost estimates comprise the previously described unit costs for each camera installation, as well as $50,000 reserved for control center equipment to monitor the corridor. The corridor packages include park-and-rides that are located, on average, within a half-mile of an existing fiber optic network. The location of fiber optic networks were estimated based on the existing WSDOT traffic camera sites, as well as by review of WSDOT's Traffic Management System map acquired from the WSDOT webpage.[1] It should be noted that while traffic cameras

[1] As presented online at http://www.wsdot.wa.gov/PugetSoundTraffic/future.htm on October 16, 2000.

are in place in Tacoma, image delivery is limited to still pictures because the fiber optic network has not yet been completed. The costs developed for implementing video surveillance in Pierce County assume that the fiber optic network is completed along the I-5 corridor prior to implementing a CCTV system.

Planning-level conceptual cost estimates for implementing CCTV at park and rides along six corridors in the study area are presented in Table 4.1. Suggested CCTV locations are presented in Figure 4.1.

Table 4.1

Proposed Video Surveillance Locations and Costs

Corridor	***P&R's Monitored***	***Estimated Cost***
I-90	Issaquah, Eastgate, S Bellevue, Mercer Island.	$444,000
Pierce County	SR-512, S Tacoma Station.	$257,000
I-5 South	Tukwila, Boeing Access CR Station, Georgetown CR Station	$350,600
I-405 (Includes SR-520)	Canyon Park, Brickyard, Kingsgate, SR-908/Kirkland Way, Houghton, Wilburton, Newport Hills, Renton, Bear Creek, Overlake, S Kirkland, Evergreen Point.	$1,192,200
Snohomish	Eastmont, Mariner, Lynnwood, Mountlake Terrace.	$444,000
I-5 North	N Jackson, Northgate, North Seattle, Northgate TC, I-5/NE 65th St.	$537,600
TOTAL		**$3,225,400**

Source: Parsons Brinckerhoff

REAL-TIME PARK-AND-RIDE INFORMATION SYSTEM (PARIS)

The concept of this ITS system is to provide information to potential park-and-ride users regarding the availability of parking spaces at park and rides along defined corridors. The Park-and-Ride Information System (PARIS) as envisioned would consist of large, informational signs located at strategic locations along a corridor, such as prior to exits to individual park-and-ride facilities. These signs would have fixed displays listing up to four park and ride locations, with a red/amber/green signal indicator next to the name of each park-and-ride listed. The indictor light would change as the utilization of the monitored lot changed. A more sophisticated system could supplement the primary freeway sign by locating smaller, secondary informational signs

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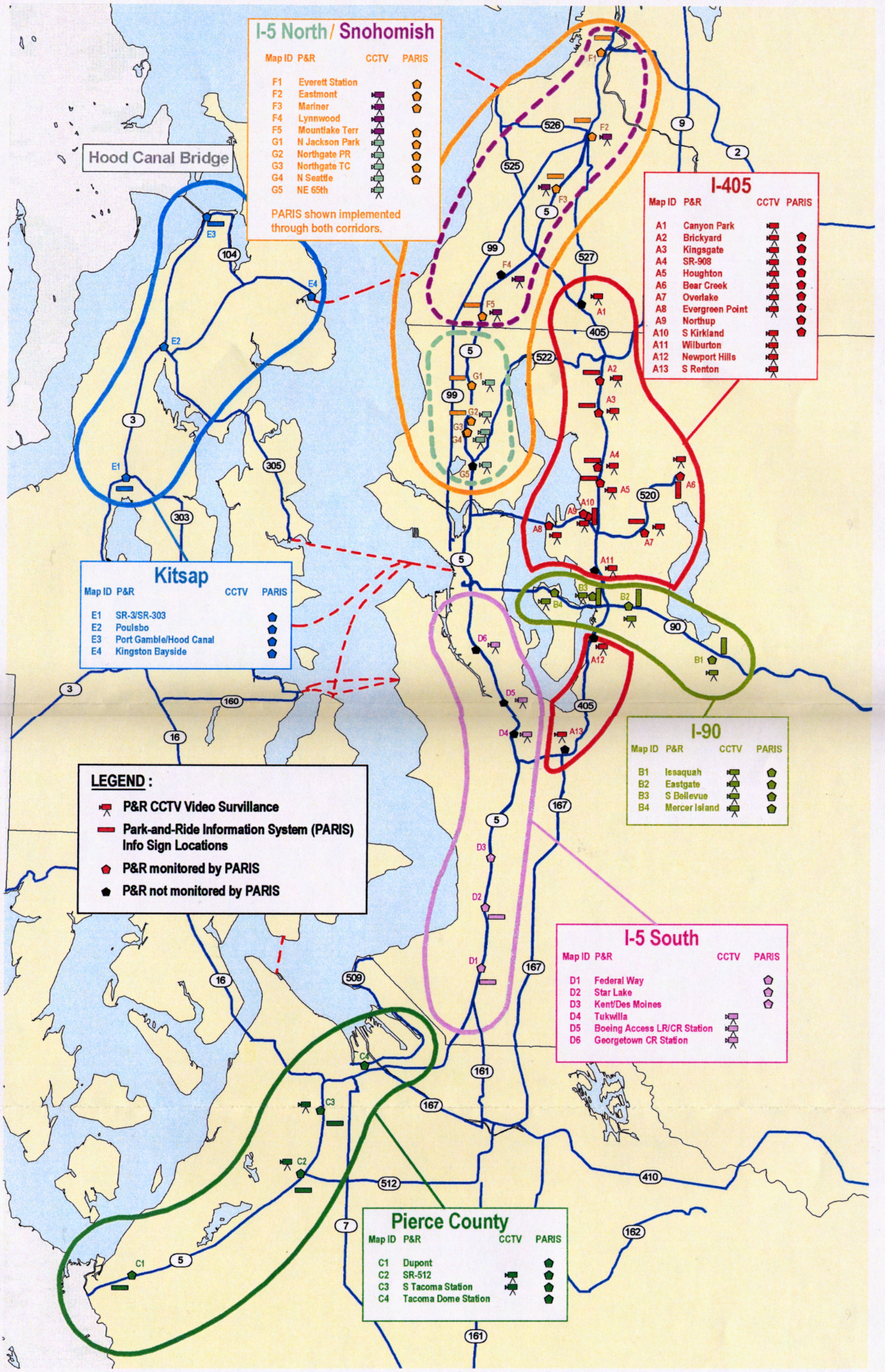

ITS System Components
Final Report
Puget Sound Park-and-Ride System Update
FIGURE 4.1

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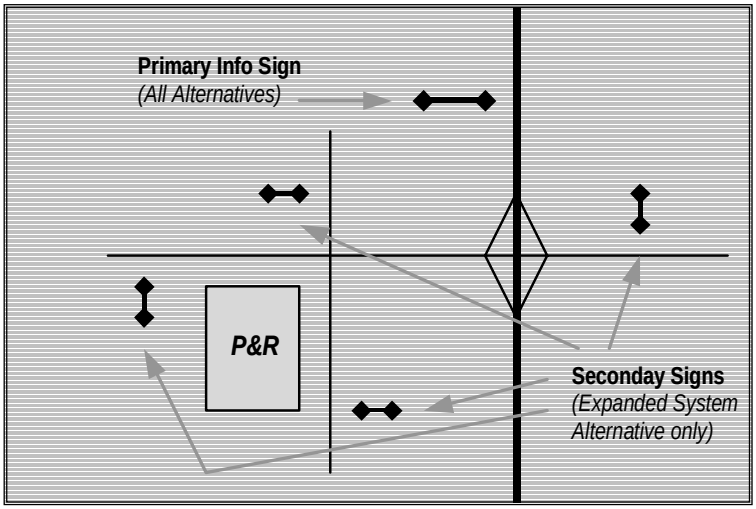
11 x 17

Figure 4.2
Secondary Informational Signs



on the arterials that lead to a monitored park-and-ride. This concept is presented in Figure 4.2. Even greater benefit might be realized by coupling the system with congestion information.

To supply data to the PARIS signs, a utilization monitoring system would be required at each park-and-ride under observation. The simplest approach would be to segregate incoming and outgoing vehicles, which would allow measurement of current utilization by tracking a running tally of on-site vehicles. For cost estimating purposes, a vehicle count system using induction loops was assumed.

Communications with a central control center between both signs and lot monitoring systems were priced as utilizing general radio or microwave communications technologies, although in many cases other options may be available (i.e., fiber optic network).

Planning-level cost estimates are presented in Table 4.2 for the two levels of implementation described previously. The first level assumes installation of large informational signs at strategic locations on the freeway corridor. The second level assumes that an additional four smaller secondary signs are installed on arterial locations in the vicinity of each primary freeway sign.

Table 4.2

Proposed Real-Time Park-and-Ride Information System

Corridor	Info Sign Locations	P&R's Monitored	Basic System Cost	Expanded System Cost
I-90	e/o Issaquah P&R e/o Eastgate P&R e/o S Bellevue P&R	Issaquah Eastgate S Bellevue Mercer Island	$465,000	$1,014,000
Pierce Co. (I-5 NB)	s/o Dupont P&R s/o SR-512 s/o S Tacoma Station	Dupont SR-512 S Tacoma Station Tacoma Dome Station	$465,000	$1,014,000
I-5 South	s/o Federal Way P&R s/o Star Lake	Federal Way P&R Star Lake Kent/Des Moines	$339,000	$705,000

Table 4.2 (cont.)

Proposed Real-Time Park-and-Ride Information System

Corridor	Info Sign Locations	P&R's Monitored	Basic System Cost	Expanded System Cost
I-405	n/o Brickyard n/o Kingsgate n/o SR 908/Kirkland Way n/o Houghton e/o S Kirk/Northup at Bear Creek e/o Overlake	Brickyard Kingsgate SR 908/Kirkland Way Houghton S Kirkland Northup Evergreen Point Bear Creek Overlake	$1,007,000	$2,290,000
Snoh/N King Co	n/o Everett Station n/o Eastmont n/o Mariner n/o Mountlake Terrace n/o N Jackson n/o Northgate	Everett Station Eastmont Mariner Mountlake Terrace N Jackson Northgate N Seattle Northgate TC	$882,000	$1,981,000
Kitsap	at Port Gamble/Hood Canal at SR-3/SR-303	Kingston Bayside Port Gamble/Hood Canal SR-3/SR-303 Poulsbo	$379,000	$746,000
TOTALS			**$3,537,000**	**$7,750,000**

Source: Parsons Brinckerhoff