Development of Private Services at Park-and-Ride Lots in Central Puget Sound

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The provision of a variety of private services, such as convenience markets, dry cleaners, video stores, and day care, at existing and proposed park-and-ride lots was investigated. Institutional and legal issues were studied and found not to pose insurmountable problems. However, they make development of new sites more attractive than development at existing park-and-ride lots. A process was created to assess the potential for development at nearly 100 sites in the Seattle area. An increasingly detailed evaluation process resulted in the selection of five case study sites—two proposed sites and three existing park-and-ride lots. A discussion of market and site requirements for retail development is included. It was concluded that private development of park-and-ride lots can help enhance patronage and rider satisfaction, provide lot security, and generate revenue for transit purposes.

The transit industry must compete with a form of transportation that provides wide-ranging mobility. U.S. society, with its many two-income households, demands timeliness and convenience to squeeze an increasing number of activities into a day. Combining secondary trips with the morning and evening commute is necessary to drop off and pick up children, shop, and run other errands. These secondary trips occur at the worst possible time for traffic conditions, and ways to mitigate them are needed.

Transit is not currently a competitive service for most secondary trips unless they are made with an automobile as part of a park-and-ride trip. For low-density suburban development, collection of transit patrons at park-and-ride lots has become an economic necessity. To reduce secondary trips, provide on-site convenience, and enhance security, many services could be jointly developed with park-and-ride lots to serve the lot patrons and general public alike. The services might include convenience stores, gas stations, video renters, carryout restaurants, cleaners, and day-care centers. Figure 1 shows a concept plan of a typical development.

To investigate the feasibility of retail and other services located at park-and-ride lots, a study was undertaken by the Washington State Transportation Center and the Municipality of Metropolitan Seattle (Metro). The study was funded by UMTA, the Washington State Department of Transportation (WSDOT), and Metro (*1*). The study was divided into segments as shown in Figure 2. The structure and significance of each phase are discussed below.

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LITERATURE REVIEW AND INSTITUTIONAL AND LEGAL ANALYSIS

Literature Review

The initial phase of the study involved an analysis of several associated bodies of knowledge. For the purposes of this study, they were divided as follows:

- Park-and-ride lots;
- Joint development;
- Transit patron distribution and collection;
- Land use opportunities and constraints;
- Site planning, circulation, and design; and
- Barriers to private activities.

The focus was on past joint development experiences and park-and-ride lot development. Also reviewed were transit infrastructure financing techniques, private-sector perspectives on joint development, surface transportation connections, land use factors, site planning and design, and barriers to private activities. The general findings from the literature search included the following:

- Little experience in the joint development of park-and-ride lots exists in the United States.
- Several obstacles minimize the attractiveness of joint development for both the private and the public sectors. For the private sector, the time frame for return on investment is much shorter than for the public sector. The public sector is primarily discouraged by the risks associated with market failure of the private services and lack of knowledge about commercial operations.
- The location of services at facilities surrounded by office developments may result in a mixed-use effect, reducing midday trips. However, few park-and-ride lots are located near office complexes.

Concurrent with the literature review, the institutional and legal issues involved in joint development of park-and-ride lots were investigated.

Institutional and Legal Analysis

Private development at park-and-ride lots can present difficult institutional issues because several agencies may participate

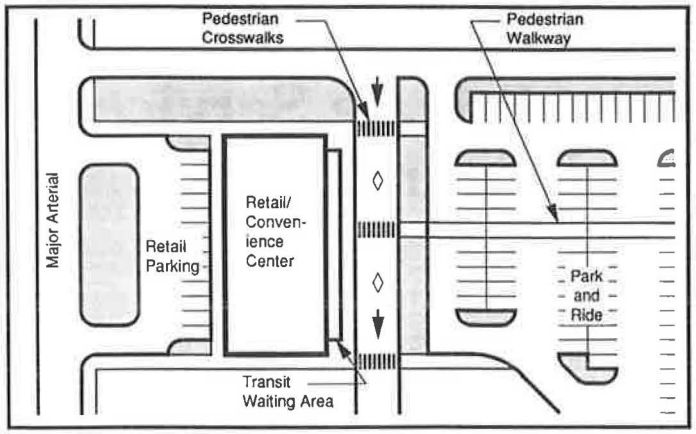


FIGURE 1 Typical park-and-ride retail development.

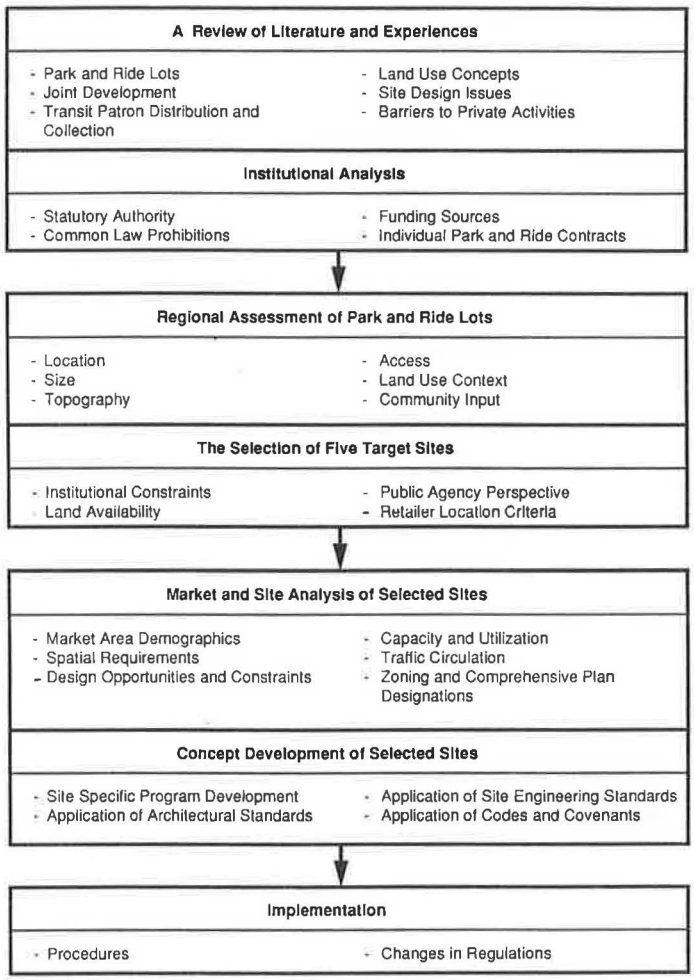


FIGURE 2 Research design.

in funding various aspects of the lot. It was found that potential restrictions on private development may arise from statutory authority; common law prohibitions; federal or state funding source statutes, regulations, and guidelines; and individual park-and-ride contracts with funding agencies.

Transit agencies will find joint development difficult without title to park-and-ride land. Each affected funding organization has its own restrictions and rules regarding the secondary use of land it has funded for park-and-ride development, but each appears to allow private development as long as its policies are followed.

Ownership

If a transit agency holds the title to a park-and-ride lot, it has a great deal of latitude concerning joint development on the property because it is subject only to its own statutory requirements and common law constraints. Transit agencies in the Seattle area are allowed to lease their park-and-ride property for private commercial uses. However, the use must be consistent with the public transportation purposes for which the property was acquired, and the property must be surplus and must not be needed for public transit purposes during the life of the joint development project.

Transit agencies usually do not own park-and-ride property. Most park-and-ride lots in the central Puget Sound area have been funded with federal or state funds or a combination of the two. This situation is true for most park-and-ride lots at transit agencies across the country, and it makes joint development more difficult.

Transit agencies may regulate certain activities at park-and-ride lots, and the prohibition of these activities may inhibit development. Examples of prohibited uses include food and beverage services, vehicle maintenance, and recycling.

UMTA Funding

The key to a successful joint development project from UMTA's perspective is that the secondary use be beneficial yet "incidental" to the facility's transportation function. For UMTA to consider the use incidental, it must be compatible with the approved purposes of the park-and-ride and not interfere with the intended function of the facility. UMTA encourages incidental uses of real property that can raise additional revenues for the transit system or, at a reasonable marginal cost, enhance system ridership. According to UMTA officials, important factors in the approval of a private-sector development project as an incidental use include the following: (*a*) how long the private development will occupy park-and-ride property; (*b*) the space occupied by the private development project relative to the space available to park-and-ride parking; (*c*) the nature of any interference with the primary transit benefits of the park-and-ride lot; and (*d*) the transit benefits of the private development project, either in additional revenues for the transit system or enhanced ridership.

Representatives from UMTA stressed that joint development proposals are reviewed on a case-by-case basis and that no clear line can be drawn between proposals that are approved and those that are rejected. Therefore, transit agencies need to give special attention to the incidental use requirement and clearly describe the benefits to transit users. UMTA regulations preclude the use of Section 3 (Capital Grant) funds for construction of commercial revenue-producing facilities, whether publicly or privately owned.

If a proposal for a joint development project is not approved, the transit agency has several options. The proposal may be revised, if possible, to meet UMTA objections and then resubmitted. If the transit agency wants to pursue the project as planned, it can determine that the property under consideration is surplus. The property must be sold at fair market value, and UMTA must be reimbursed for the percentage of the property that it owns. This alternative allows the project to proceed, but it eliminates any monetary benefit to the transit agency. However, it provides some benefit to transit users because of the retail services to be provided at the park-and-ride, and it increases the attractiveness of the park-and-ride.

FHWA Funding

If funds from FHWA were used to purchase park-and-ride property, its policies concerning the use of the property and associated revenue must be followed. FHWA dispenses its funds through the state departments of transportation for highway projects. Transit agencies must first apply for approval of a joint development project through their state department of transportation, which will forward the proposal to FHWA. FHWA considers park-and-ride lots to be highway projects, and the lots are covered by the same policies.

FHWA must approve a transit agency's proposal for joint development before any property rights are conveyed to the developer. If a joint development proposal is approved, the transit agency must charge at least fair market value for the sale, use, or lease of the property, with an exception granted for social, environmental, or economic mitigation purposes. The exception allows the transit agency to provide leased space at the park-and-ride at the best rate it can obtain if fair market value cannot be achieved. The exception may also include socially beneficial uses, such as a day-care center, at a rate below fair market value.

The federal share of net income (gross income minus operating expenses) is based on the participation ratio each state uses in claiming reimbursement for acquisition if federal funds were used to help construct the park-and-ride project. These funds must be used as a direct credit to other projects eligible for federal highway grants, such as additional park-and-ride spaces, and cannot be used to cover operating expenses. Each state department of transportation must approve this process and the project to receive the revenue from the joint development.

FHWA has no written criteria for evaluating private development projects at FHWA-funded park-and-ride lots. In practice, though, the criteria appear to be similar to those of UMTA.

As with UMTA, if the proposed project is not approved by FHWA, the transit agency may resubmit the proposal with the requested modifications or declare the property to be surplus. If the property is declared to be surplus, the transit agency must compensate FHWA for its share. The transit

agency must reimburse FHWA up front, as in the case of UMTA. Once it has reimbursed FHWA, the transit agency is limited only by its statutory powers and by any common law prohibitions against proprietary activities by governmental agencies.

State Ownership

If funds from a state department of transportation have been used for a park-and-ride, approval for a joint development project must be obtained from the state department of transportation. WSDOT grants approvals for joint development projects on a case-by-case basis. Among the requirements for approval are that the sale or lease be based on the fair market value of the property, that no net loss of parking spaces occur at the park-and-ride lot, and that the commercial development not interfere with transit purposes.

WSDOT has the authority to lease or sell unnecessary highway land or air space, including park-and-ride lot property, provided that the property is no longer required for highway purposes and that it is in the public interest to do so. WSDOT may look favorably on property exchanges between the state and private entities involving park-and-ride lots if the public benefits, especially in additional park-and-ride space. WSDOT will only approve the sale of park-and-ride properties to private entities when it is clear that the properties will no longer be needed for transportation purposes.

PROCEDURES: ANALYSIS OF PARK-AND-RIDE LOT DEVELOPMENT POTENTIAL

Site Inventory

A preliminary assessment of development potential began with a complete list of park-and-ride lots in the Seattle area. The list was reviewed to eliminate sites that would be inappropriate for joint development. As a result, leased lots and lots under 50 stalls were eliminated from further consideration. The locations of regional lots are shown in Figure 3.

The same characteristics that make a site attractive as a park-and-ride lot, such as good location, visibility, size, and access, also make the site attractive for private commercial development. Table 1 gives some of the locational criteria for park-and-ride lots and retail space. There is a significant degree of overlap in the criteria for the two uses. However, whereas a site may be attractive for development, the transit function remains the paramount purpose of the park-and-ride system. Ways were analyzed to supplement the supply of park-and-ride spaces through a variety of joint development methods, such as potential land trades, shared parking with adjacent businesses, on-site retail development, and commercial development at sites adjacent to the facilities. If a park-and-ride lot was at or near capacity, spaces could not be eliminated to allow for joint development, even though the lot may have been otherwise ideal. In such a case, air rights development (if feasible) or land trades for larger, more suitable nearby sites were considered.

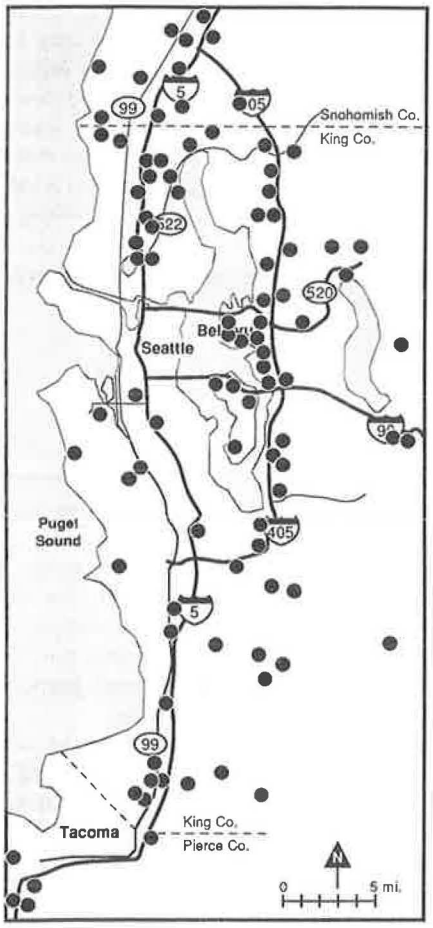


FIGURE 3 Location of park-and-ride lots.

TABLE 1 CRITERIA FOR THE LOCATION OF PARK-AND-RIDE LOTS AND RETAIL SERVICE DEVELOPMENT

	Park-and-Ride	Retail Space
Distance to Downtown	•	
Access to Freeway	•	•
Local Demographics	•	•
Freeway Congestion	•	
HOV Lanes	•	
Arterial Volume	•	•
Other P&R Lots	•	
Other Retail Space		•
Visibility from Freeway and Arterial	•	•
Land Use and Zoning	•	•
Catchment Area for Arterial Traffic	•	•
Institutional Issues	•	•
Development Interest	•	•

Evaluation Process

On the basis of the data gathered on the park-and-ride sites, pictures and videotapes, and the research staff's impressions, the joint development potential of the lots was assessed. To narrow the list of park-and-ride sites to be considered for joint development, the sites were categorized into those with high, moderate, and limited potential.

Sites with high potential met the criteria of adequate space for surface or air rights development, good visibility, good

access from major arterials or freeways, and desirable locations. In addition, these sites were attractive because of the caliber of adjacent development or the character of the surrounding area.

Sites with moderate potential offered a mix of the characteristics of the high-potential sites but not to the same degree. Moderate-potential sites presented more challenges to joint development than did the high-potential sites.

Sites with limited potential were either fully utilized with no possibility of expansion or lacked many of the characteristics necessary for consideration of joint development. However, some of the low-potential sites were possible locations for mobile services such as espresso stands or pick up–drop off dry cleaning service.

The initial evaluation placed 50 lots in the categories of high, moderate, or limited potential for joint development. The other 40 sites were mostly leased space, which greatly reduced or eliminated their potential. The initial information was used for a more detailed analysis of these sites' market potential for joint development.

Retail Market Feasibility

The assessment of the high-potential candidates was based on an analysis of retail market feasibility from a developer's perspective. The following methodology was developed and used as a guideline for assessing the potential development sites. The primary question was whether a retail developer could be attracted to a high-potential location. From a developer's perspective, the key factor encouraging development is the ability to profitably attract tenants. To attract them, both developer and tenant must believe that sufficient surrounding trade area demand exists to support the risk of achieving profitability. Retail market analysis gauges trade area demand and thus profitability.

Typically, retail market analysis methodology encompasses the following steps (*2*).

1. Evaluate the site as a retail location. Frontage on a major arterial is of primary importance.
2. Establish an effective trade area. Transit patrons will not provide the primary demand; therefore, relationship to available retail outlets is important.
3. Analyze trade area population and buying power. Age and income of the population in the trade area determine buying power.
4. Determine retail customer expenditure potentials within the trade area. Projections of expenditures by type of good or service help assess the market for particular stores.
5. Assess trade area retail competition. The ability of the market to sustain more retail must be determined.
6. Forecast market penetration and retail sales volume at the subject site. With the preceding information, plus information about future development, the market share for a given retail outlet is forecast.
7. Determine the mix and square feet of retail space market supportable at the subject site. This is used in discussions with possible tenants.

Each of these seven steps was used to develop a short list of existing and proposed park-and-ride lots that would be good development candidates.

Retail Compatibility—Physical Design Criteria

Other site-specific information was used in the analysis, including available space, land use and political constraints, institutional constraints, and circulation.

Available Space Most existing park-and-ride sites were designed to maximize the capacity of the site. For this reason, they often contained little or no undeveloped land (at grade) suitable for retail space. Exceptions to this constraint included air space development where economically and institutionally feasible, topographic opportunities such as slopes, and sites in the planning phases of development.

Land Use and Political Constraints Some sites were located in areas that had incompatible adjacent land uses for certain joint development purposes. An example of this constraint is the location of a park-and-ride facility in an area of single-family housing. Inhabitants of such an area may oppose certain retail uses at the park-and-ride facility and may be organized well enough to block development. Environmental sensitivity and issues of zoning conformance were also analyzed at the high-potential sites.

Institutional Constraints Several institutional constraints governed the use of park-and-ride lots owned or funded by UMTA, FHWA, and, in this case study, WSDOT. The regulation that most restricted the development of a nontransit public benefit use was that against reducing the number of parking spaces.

Circulation Access to the site from a variety of modes was analyzed. Turning movements onto sites, levels of service of adjacent intersections, and congestion levels of roads around the sites were analyzed. Pedestrian and other nonvehicular linkages to the site were viewed favorably.

THE FIVE CASE STUDY SITES

The selection of the following five sites for a more detailed analysis of joint development potential was based on the foregoing criteria. The retail market potential, in conjunction with the physical constraints of each potential site, was analyzed. The three existing sites selected were Woodinville, South Bellevue, and Eastgate. The two proposed sites selected were the northwest quadrant of 164th Street and I-5 in Snohomish County and the southwest quadrant of 54th Avenue and 20th Street in Fife, Pierce County (see Figure 4).

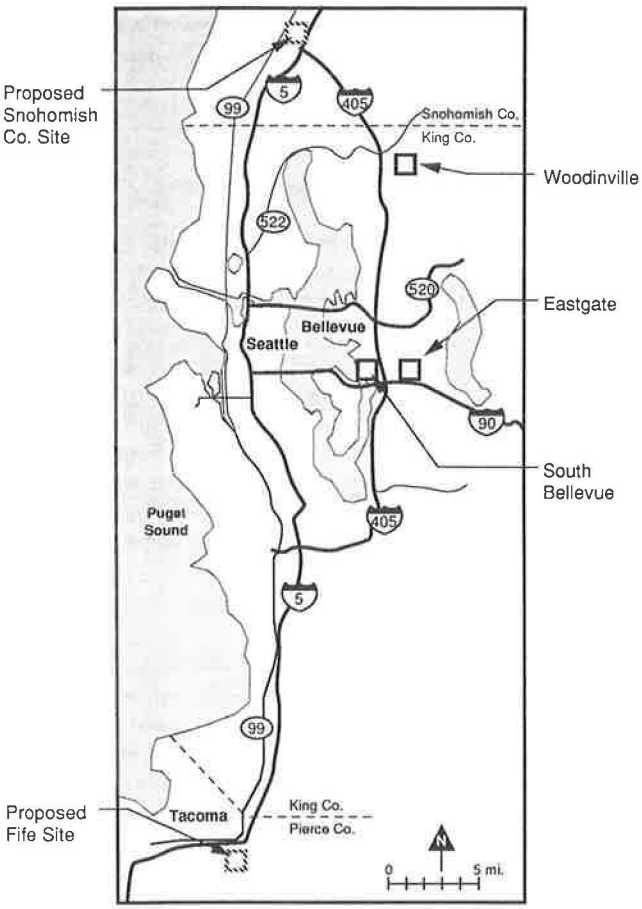


FIGURE 4 Location of five target sites.

Woodinville—Woodinville-Duvall Road-140th N.E.

This location was chosen because space was available for development without taking parking spaces away from the lot. Adjacent land uses were also supportive of joint development.

South Bellevue—Bellevue Way-112th S.E.

Reasons for selection included easy access to the rapidly developing I-90 corridor, adjacent land use (Mercer Slough Park), conduciveness to day care, and minimal vehicle-pedestrian conflicts.

Eastgate—S.W. Eastgate Way-136th S.E.

The proximity and ease of access of this site to major retail and service concentrations made it an excellent candidate for a mobile services vendor. Adjacent land use, which was office and commercial, offered market potential for any services located on this site.

Snohomish County—Northwest Quadrant of 164th Street and I-5

During the study, this project was in the planning phases. It was selected on the basis of visibility from 164th Street, frontage along 164th Street, market potential from the trade area to the west, limited convenience competition in the trade area (west of I-5), and the ability to properly plan the site to incorporate retail requirements.

Fife—Southwest Corner of 54th Avenue and 20th Street, Paralleling I-5

The reasons for selection of this undeveloped site included the benefits of planning for joint development in the development phases, reasonable access to I-5, projected demand, supporting adjacent land uses, visibility of the site, excellent frontage, and sufficient space.

MARKET AND SITE ANALYSIS

Once the study sites had been selected, their potential to support joint development could be determined.

The analysis of convenience and retail services focused on site selection criteria from the perspectives of developers and private store operators. The intent was to demonstrate to transit decision makers the locational, market, and financial criteria that the private sector requires to develop retail outlets or offer off-site services from a park-and-ride lot.

The analysis of each site included a survey of on-site features, such as topography and slope, and off-site features, such as adjacent land uses. In addition, the institutional and political constraints of each site were analyzed. The site analysis and land use study was presented in graphic form on a scaled plan of the site that included adjacent land uses. By conducting the two analyses in tandem, the study team could better match services to sites.

Analysis of Selected Convenience and Retail Services

The selection of services presented in the analysis was based on community input and recommendations made by a real estate development consultant. The services included day care, convenience stores, automotive service and lube centers, mobile services, and concierge services.

On-Site Day-Care Centers

The demand for proprietary day care greatly exceeds supply nationwide. Social trends underlie this condition.

Proprietary child care facilities were the focus of this project. Such facilities are normally designed for infants, toddlers, preschoolers, kindergartners, and year-round (before and after school and during the summer) elementary school children. Services offered include exercise, supervised play, reading,

introduction to computers, field trips, evening care, drop-in hourly care, and transportation to and from elementary schools.

Proprietary day-care centers do not necessarily require direct frontage on major arterials. Exposure is not as critical as it is for most other retail and service businesses. Area parents quickly find day-care centers. Thus, day care could be placed toward the rear of park-and-ride lots, where land costs are less, noise and air pollution are low, and site exposure is already high because of the lot.

The maximum trade area radius for a proprietary day-care site is normally about 3 mi. Nationally, research indicates that most parents reside within a 2-mi radius of the day-care center they patronize. Preschool children typically are drawn from further distances than elementary school children (*2*). The dual purpose accomplished by locating day care at park-and-ride lots would probably result in increasing the trade area size above these national norms.

Interviews with multistate day-care center developers indicate that exploring the concept of locating day-care centers on certain Seattle area park-and-ride lots would be of interest. The idea fits their current pursuit of new market segments requiring day-care services.

Proprietary day-care developers usually seek a trade area with a radius of approximately 3 mi and containing 25,000 to 30,000 people. However, a 50,000-person trade area population is preferable. Exceptions to this criterion are often made if an area is growing quickly. In certain rapidly growing areas, an existing population of only 15,000 within a 3-mi radius has been acceptable (*2*).

On the basis of interviews with multistate day-care center developers, it is estimated that the minimum land requirement for a day-care center at a park-and-ride lot is 18,000 ft^2. Typically, a 30,000 ft^2-site is required once setback, landscaping, parking, play area, and building site requirements have been met (*2*).

Day-care center prototype buildings run about 6,200 to 6,700 ft^2. Typical dimensions are 110 × 61 ft. The buildings usually accommodate from 100 to 125 children. Play areas are often about 10,000 ft^2. Parking requirements usually are one stall per employee, or four or five stalls (*2*). Extensive parking facilities are not necessary because parents usually park briefly to drop off and pick up their children.

The typical cost of a proprietary day-care building is about $325,000, or approximately $48/$ft^2$. Site costs usually run between $100,000 and $150,000, including site work (*2*). Day-care center developers at park-and-ride lots could mitigate such land costs if they were willing to sign ground leases with the transit authority.

Convenience Stores

The convenience store concept focuses on satisfying the majority of food and nonfood purchase requirements of consumers who desire quick, nearby service any time of day, every day of the year. Typically, two-thirds of the customers of a convenience store have been patronizing it for more than 1 year. In descending order of importance, customer reasons for shopping at convenience stores are (*a*) fast service, (*b*) nearness to home or work, (*c*) availability early and late hours, (*d*) friendliness of staff, (*e*) gas prices, and (*f*) other.

Gasoline sales, which typically make up about 60 percent of total sales, usually accompany merchandise sales at convenience stores. Offering gasoline is one way to attract customers into the store. Obviously, the acceptability of gasoline sales on park-and-ride sites could be an important issue for transit authority decision makers.

Economic success depends on locating a clean, neat, and bright store building on a well-traveled street. Excellent exposure and site egress and ingress are critical to economic success. A high-traffic corner location offering unobstructed turning movements is preferred. Highly visible signage is a must. Convenience store sites must be surrounded by a residential trade area with sufficient buying power to achieve a profitable sales per square foot performance level, roughly $250/$ft^2$ annually. The trade area radius for convenience stores is typically 2 to 3 mi. However, more than half of total sales volume usually comes from residents living within 1 mi of the store. Usually 85 percent of customers travel to convenience stores by automobile (*2*).

Typical lot size requirements for a convenience store range from 12,000 to 18,000 ft^2. The accompanying asphalt parking area needs to be large enough to accommodate 10 to 13 cars. Convenience store buildings are usually about 2,400 ft^2 (*2*).

Security is a major issue associated with the private development of park-and-ride sites. The presence of services on and adjacent to park-and-ride facilities may well provide a strong deterrent to vandalism. The selection of quality private services is essential to the achievement of this objective.

Automotive Lube Centers

Competition for the automotive lube customer is keen. New car dealers are aggressively marketing to the oil change customer. Dealerships are encouraging lube and oil service when customers return their vehicles for warranty and repair work. Repeat customer business is cultivated at automotive lube centers. Follow-up service reminders are often sent to customers, and coupon specials are an added incentive to return.

High traffic counts and a highly visible location are a must in this business. Any site that has even moderate real or perceived access impediments will be rejected. A reason for this site location sensitivity is that many oil changes occur on "driver impulse." Lube center services must therefore appear quick, convenient, and not out of the way.

The trade area goal for lube centers is 75,000 motor vehicle registrations within a 3-mi radius. Although lube stores open in 3-mi-radius trade areas of 50,000 vehicle registrations, the competition that rapidly follows means that someone will probably not survive (*2*). In addition, locations on the periphery of the central business district adjacent to high concentrations of daytime employees are desirable.

The motor vehicle registrations count is critically important. Profitability typically depends on attracting from 30 to 50 lube and oil change customers per day to break even. The market target is 55 (*2*). The number of lubes per day required to break even mainly depends on land and building costs and on variable real estate tax and insurance expenses.

An automotive lube center absorbs about ½ acre of land. The minimum land area requirement is 18,000 ft^2, including

a stacking and turning area for at least 12 cars. A typical automotive lube center building is 5,000 ft^2 (50 × 100 ft) (*2*).

Mobile Services

The idea behind this concept is for a vendor to sell coffee, juices, soft drinks, pastries, tickets, books, or papers from a mobile vehicle that services park-and-ride users during peak morning hours. Market support for this concept at park-and-ride lots is unproven in the Seattle area. The level of services could range from a mobile food van that makes a target park-and-ride site one of several stops on its daily route to development of a coffee and pastry kiosk on particular sites.

Concierge Services

The location of concierge services at selected park-and-ride sites might satisfy key public and private goals. Transit authorities could increase ridership and create public goodwill by offering convenient services for commuters at target park-and-ride locations. Private-sector profit potential exists for a skillfully managed concierge service at target park-and-ride lots.

A park-and-ride lot concierge service would operate as follows. A menu of services would be offered to commuters at an on-site concierge facility. Usually these services could be accomplished during the business day, perhaps by the concierge during the "off" hours of transit (i.e., 10 a.m. to 3 p.m.). The services could include dry cleaning and alterations, shoe repair, car detailing, automobile servicing, flower and balloon sales, entertainment ticket sales, travel services, video, film processing, personalized shopping, gift wrapping and shipping, company party arrangements, reminder services, search and quote services, house and yard cleaning, goods returned to retail stores, and courier services. No precedent exists for developing the concierge concept at park-and-ride lots in the Seattle area. Moreover, little joint development experience of similar concepts exists nationwide, except for one unsatisfactory experience in Houston.

The concierge service business is a personal relationship business. Operations at a particular location are not likely to stabilize until the service has operated for about 3 years. Experience indicates that the business builds slowly. Customers must both become familiar with the services and learn to trust the concierge operator. Repeat customer patronage patterns must be established.

Interviews with concierge service operators indicate that the park-and-ride lot concierge facility could be integrated into an enclosed waiting area for riders. The use of a movable unit that could be towed to the site was considered less desirable. The enclosed waiting area and concierge facility should be built and owned by the transit authority, and the concierge space should be leased to the private operator. Quality signage should be permitted to clearly communicate to riders the concierge services available. The concierge service should be high profile to attract transit riders to patronize the concierge service and to facilitate security of the operation and the park-and-ride lot.

The concierge operator would develop contractual agreements with various vendors in the trade area surrounding the park-and-ride site. Payment would be collected for the particular service by the concierge who, in turn, would pay the service providers, minus a percentage of the gross sale. The concierge operator would be required to carry appropriate insurance. An arbitrator for disputes might also be appointed.

The concierge service concept appears workable. Transit ridership should be enhanced because of time-saving services offered at park-and-ride lots that would make life easier for commuters. The risk of failure could be mitigated because the enclosed transit waiting area containing the concierge service could easily revert to a rider waiting area.

Table 2 summarizes the information given in this section and provides requirements for other services.

Site and Market Analysis

Only two of the project's five case studies will be presented here. Though it would be difficult to identify either of these as typical, they represent a range of possibilities. The sites presented are South Bellevue and 164th and I-5 (see Figure 4). Site design criteria drew heavily on other sources (*3–11*).

South Bellevue

The site and its characteristics are shown in Figure 5. Important considerations are as follows: the site is partially located in a designated sensitive area and is surrounded by a planned regional park, an interpretive center and farmers' market are being proposed south of the site as part of the

TABLE 2 POTENTIAL SERVICES AT PARK-AND-RIDE LOTS—MINIMUM SPACE NEEDS

Use	Minimum Requirements
Day care	PR-5 stalls, 18,000 sq. ft. lot, 6,200 sq. ft. facility
Convenience store/ Mini-mart	PR-10 stalls, 12,000 sq. ft. lot, 2,400 sq. ft. facility, FR
General auto service	FR-100', PR, 14,000 sq. ft. lot, 5,100 sq. ft. facility
Auto lube center	FR, PR-12 stalls, 18,000 sq. ft. lot, 5,000 sq. ft. Facility
Auto parts center	4,000 sq.ft., FR, PR
Florist Stand	200 sq. ft., MS, FR, PR
Dry cleaner/tailor	400 sq. ft., FR, PR
Video rental	200 sq. ft., MS, FR, PR
Newspaper/magazine vendor	800 sq. ft., MS, FR, PR
Take-out food	1,200 sq. ft., FR,PR
Coffee/pastry vendor	400 sq. ft., MS
Bagel/donut shop	600 sq. ft., MS, FR, PR
Fax/copy center	1,200 sq. ft., FR, PR
Shoe repair	400 sq. ft., FR, PR
Pharmacy	1,200 sq. ft., FR, PR
Film processing	200 sq. ft., MS, FR, PR
Package delivery	1,200 sq. ft., FR, PR
Mobile library	200 sq. ft., MS
Postal contract station	200 sq. ft., FR, PR

Key:	Symbol	Description
	FR	frontage requirement
	MS	potentially a mobile service
	PR	parking needs to be provided

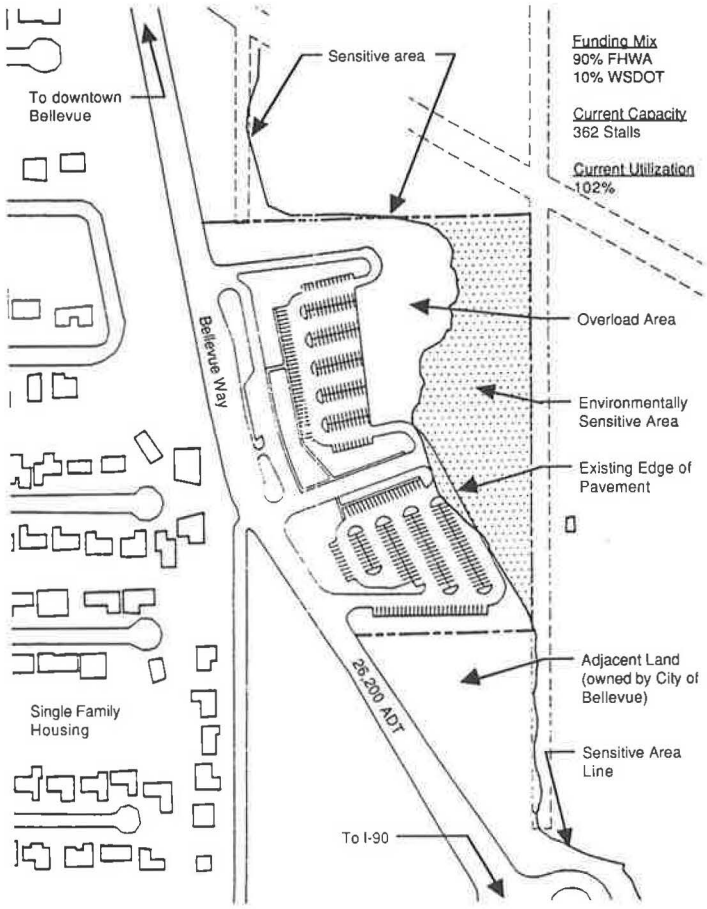


FIGURE 5 Site analysis and land use study, South Bellevue park-and-ride lot.

park development planned by the city of Bellevue, utilization is more than 100 percent, need for more parking exists on the site, and adjacent land use suggests that day care is the most suitable development.

Day care is an excellent option for development adjacent to this site. The proposal for day care was based on the following factors:

- Additional parking capacity is needed at the facility.
- The city of Bellevue owns all of the land surrounding the site and intends to build an interpretive center adjacent to the southern border of the site. A day-care center could be incorporated into park buildings.
- "High-end," single-family housing has been developed across from the site.
- Market demographics indicate that day care would be viable in this location.
- Day care does not depend on arterial frontage, which is not an option at this location.
- Sufficient space on Bellevue's site exists to support the development of day care at this location.
- The development of a park by the city of Bellevue around the site with interpretive nature trails would make this location excellent for children.

The development of day care with the city of Bellevue would present several institutional issues and design challenges. They could be addressed by creating a shared-parking agreement between the operators of the interpretive center and the transit operator (Metro), providing a drop-off area for the day-care facility and five parking spaces for day-care workers and visiting parents, adhering to all applicable codes of the city of Bellevue, providing a 10,000-ft^2 play area for children and a 7,000-ft^2 pad for the day-care facility, maintaining a 50-ft setback from the established sensitive area line for all structures, and increasing the attractiveness of the park-and-ride facility by introducing additional professionally designed and installed plant materials.

WSDOT is interested in developing additional capacity at this site. An analysis of the as-built grading plans and several site visits indicate that approximately 113 additional parking spaces can be developed in a previously graded overflow area. If the interpretive center were constructed, approximately 50 additional spaces could be obtained through the development of a shared-parking agreement.

Figure 6 shows the proposed layout of a day-care center, farmers' market, and interpretive center. A key implementation issue is the development of additional park-and-ride spaces near a sensitive area. This issue may require additional mitigation for the existing and proposed parking.

I-5 and 164th Street (Proposed Park-and-Ride Facility)

Figure 7 shows the site and characteristics. Considerations for this future facility include the severe traffic congestion along

164th Street, the creation of sufficient space for a park-and-ride lot at this location by realignment of Ash Way, the development of channelization and access management for 164th Street, the designation of the interchange of 164th Street and I-5 as a possible interim terminus for a high-capacity transit line that is under study, and the potential for on-site retail at this site.

Convenience retail was selected as the most appropriate use at this site on the basis of the market and site analysis findings. Among the findings were that sufficient average daily trips are made along 164th Street to support retail, there is a lack of convenience services to the west of I-5 along 164th Street, the interchange of 164th Street and I-5 is a high-exposure corner, reconfiguration of the intersection of Ash Way and 164th Street is planned, and the opportunity exists to integrate on-site services in the planning phases of the facility.

The development of a jointly used facility depends on meeting the needs of both the transit and the retail functions. The design objectives were tailored to provide

- Sufficient parking for retail patrons,
- Landscape areas around the retail center to make the facility attractive,
- Pedestrian linkages across the site from north to south and from east to west,
- Covered pedestrian walkways wherever possible,
- Links to adjacent areas with sidewalks,
- A pedestrian waiting area near the convenience services,
- Designated crosswalks in any location where pedestrians would cross vehicular traffic,
- Convenience services that are quick to use,
- A freeway flier stop along the southbound off-ramp to 164th Street,
- A circulation system with minimal left-turn movements,
- Transit-only lanes to ease access for transit to and from I-5 and the site,
- Shelters in the retail building structure,
- Additional shelters at the freeway flier stop, and
- Maximum exposure for retail operations from both 164th Street and the park-and-ride facility.

The development of the site was to be divided into two phases to spread capital costs and judge actual demand.

The development for the proposed facility is shown in Figure 7. The site closely approximates the concept of retail integration that provided the impetus for the study.

CONCLUSION

Many benefits could be associated with joint development of park-and-rides. They include attracting new riders; providing

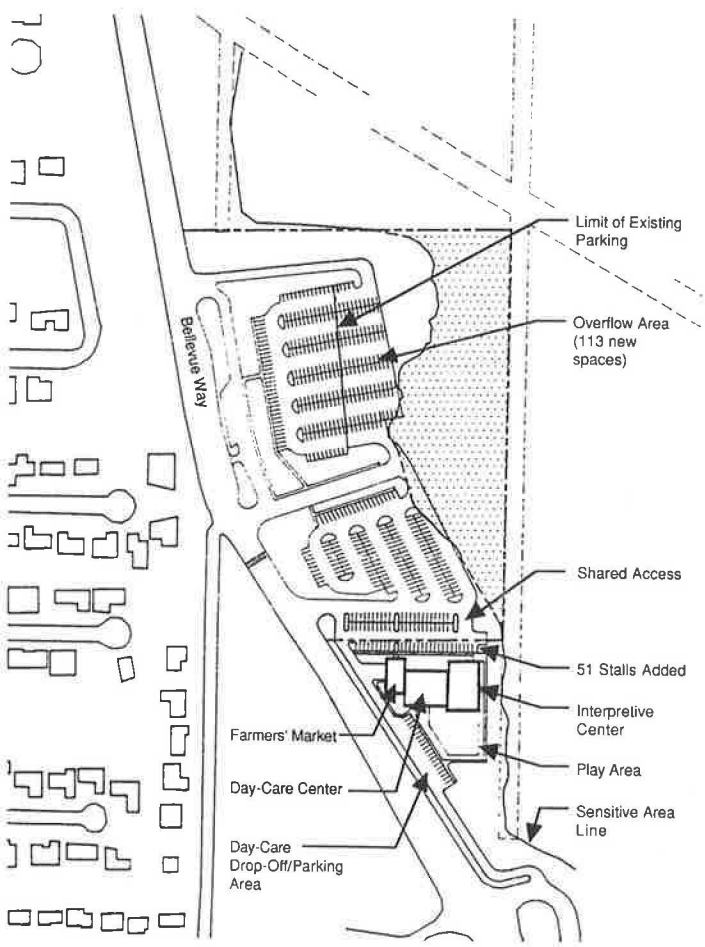
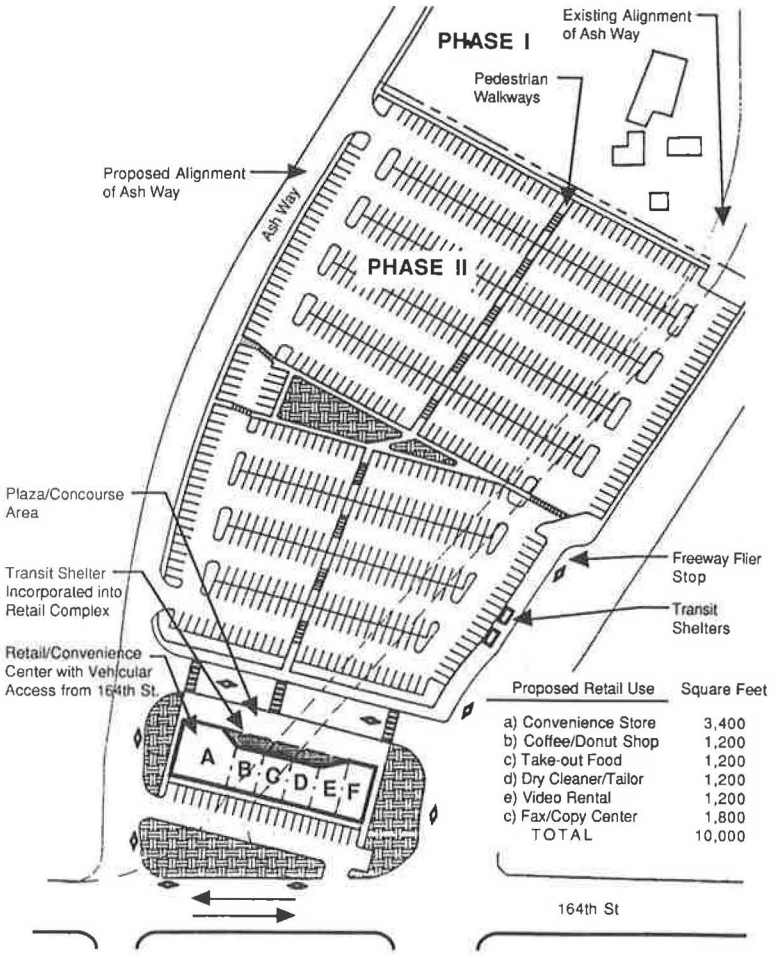


FIGURE 6 Day-care and interpretive center concept, South Bellevue park-and-ride lot.



Proposed Retail Use	Square Feet
a) Convenience Store	3,400
b) Coffee/Donut Shop	1,200
c) Take-out Food	1,200
d) Dry Cleaner/Tailor	1,200
e) Video Rental	1,200
c) Fax/Copy Center	1,800
TOTAL	10,000

FIGURE 7 Park-and-ride development concept with retail: Snohomish County, 164th Street and I-5.

lot security; increasing rider satisfaction and reducing automobile trips through the provision of retail services; and obtaining additional park-and-ride spaces through joint use agreements, land trades, or with revenue generated by joint developments. The possible benefits need to be confirmed through implementation of these concepts and evaluation of results. There appears to be enough promise to try some demonstration sites.

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