

**PARK AND RIDE:  
TRANSPORTATION PLANNING BRANCH POSITION PAPER**

Strategic Planning Section  
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## 1. Introduction

The purpose of this paper is to provide a thorough discussion of issues concerning parking facilities built to serve transit passengers at light rail transit (LRT) stations and transit centres. These issues include parking facility location, design, fees, operation and maintenance, and capital and operating costs.

**Park and Ride** are parking facilities that are built to formalize and make readily available the option of multimodal travel (automobile, carpool, or bicycle with transit) and allows the transfer to a high-occupancy mode. Park and ride facilities are typically located at transit centres or rail transit stations and can range from surface lots to multi-storey parking structures.

The provision of park and ride facilities influences the following goals defined in the below noted City of Edmonton strategic plans.

- *The Way Ahead* (Strategic Plan) 10 Year Strategic Goals:
  - Preserve and Sustain Edmonton's Environment
  - Shift Edmonton's Transportation Modes
  - Transform Edmonton's Urban Form
- *The Way We Grow* (Municipal Development Plan) Strategic Goals:
  - Managing Growth through Sustainable Urban Form & Integrated Land Use and Transportation
  - Natural Environment
  - Working within our Region
- *The Way We Move* (Transportation Master Plan) Strategic Goals:
  - Transportation and Land Use Integration
  - Access and Mobility
  - Sustainability
  - Transportation Mode Shift

This paper is organized as follows. Section 2 describes what park and ride is, how it is used, the impacts park and ride can have, and how park and ride is being employed in other municipalities. Section 3 summarizes the approach to park and ride that has been taken by the City of Edmonton and presents statistics on use of existing park and ride facilities. Section 4 presents the City of Edmonton's position on park and ride and highlights the proposed approaches to key considerations in providing park and ride facilities within Edmonton and the Capital Region. Finally, Section 5 outlines the next steps that are required to finalize the Park and Ride Policy Procedure.

## 2. Park and Ride Overview

Park and ride facilities are primarily oriented to commuting trips destined to the central business district (CBD) or a major activity centre such as universities. Park and ride intercepts commuters in low-occupancy automobiles prior to their destination, transferring the drivers and/or passengers to transit. The users of park and ride are typically trip makers with choices - they have an automobile but do not necessarily need to take it all the way to their destination. Park and ride facilities are accessed by automobiles or bicycles and may include bicycle storage, short term parking areas for passenger drop off (kiss and ride), and a number of potential amenities including enclosed waiting areas, lighting, benches, and some types of adjunct services such as retail.

### 2.1 PARK AND RIDE OBJECTIVES AND IMPACTS

Key objectives and positive outcomes of park and ride include:

- Increasing the availability of alternatives to driving alone.
- Concentrating transit rider demand to a level enabling transit service that could not otherwise be provided.
- Expanding the reach of transit into low density areas, thereby bringing more riders to premium transit services like LRT and premium bus.
- Reducing vehicle-miles of travel (VMT) and possibly pollutant emissions.
- Shifting parking away from the CBD and, to some extent, other dense activity centres to areas with lower land costs.
- Relieving neighbourhoods of uncontrolled informal parking caused by park and ride activity occurring in the absence, or with insufficient capacity, of formal facilities (Turnbull et al, 2004).

Park and ride can also have negative impacts:

- Competing with local transit service.
- Sterilizing the land surrounding the rail station or transit centre, limiting its potential for beneficial development such as transit oriented development.
- Increasing the walking distance to transit and impeding pedestrian access.
- Encouraging ridership that is concentrated only during peak periods.
- Causing spillover parking into surrounding neighbourhoods if adequate park and ride capacity is not provided, the parking facility design does not allow for the efficient movement of people to access transit, or parking fees are too high.

### 2.2 PARK AND RIDE CHARACTERISTICS

The following summarizes basic characteristics that can be used to classify park and ride facilities.

**Size.** The size of park and ride facilities can range from small surface lots to multi-storey parking structures and is dependant on a number of factors that affect demand including the transit service provided, the land use density of the surrounding area, the distance from major destinations, the proximity to other park and ride facilities and the transit and land use objectives for the station.

**Location/Siting.** Park and ride can be located in three general areas:

- *Peripheral* - located on the edge or fringe of a downtown area or other major activity centre and used to intercept automobiles prior to entering the congested core. Peripheral parking has not been shown to be an effective way to induce mode shifts and has limited impacts on reducing VMT and pollutant emissions (Kuzmyak et al, 2003; Turnbull et al, 2004).
- *Suburban* - located near the home origins of trips, with destinations of trips typically concentrated in CBD or major activity centres such as universities served by premium transit. The majority of a trip's length is made on transit with the short first segment being made by automobile, carpool, or bicycle (Turnbull et al, 2004).
- *Remote* - located in rural or small town settings or at the periphery of a city (Turnbull et al, 2004).

**Type of Use.** Park and ride facilities can be *exclusive-use* being planned, designed, constructed, and operated specifically to serve park and ride functions or *shared-use* where the parking facility is shared jointly by neighbouring functions such as shopping centres, recreational facilities, or churches.

**Parking Fees.** Park and ride facilities can be free of charge or require users to pay a fee and is influenced by a number of factors including the cost and availability of parking at the CBD or major activity areas.

**Transit Service.** The type of transit service - LRT, premium bus, express bus, or local bus - provided at a park and ride facility has direct impacts on park and ride demand, transit ridership, and the size of the catchment area that the park and ride will draw users from (Turnbull et al, 2004).

## 2.3 FACTORS SUPPORTIVE OF PARK AND RIDE USE

There are a number of factors that influence people's decisions to use park and ride. A study of the factors that contribute to the decision to use park and ride from cities throughout Canada and the United States of America (U.S.) found the following to be key indicators of success for a park and ride facility.

- Facility operation connected via direct transit service to a major workplace attraction, preferably the CBD.
- Availability of express transit service or transit service with priority, and particularly service that provides competitive travel times to the automobile.
- Provision of frequent transit service, preferably at 15-minute or closer intervals during the peak period and extended hours of service to provide options for non-peak riders.
- Location in corridors with highway congestion, preferably with the facility located/sited in advance of congestion.
- Facility siting that has good visibility and affords quick and easy highway access, preferably within ½ mile or so (800 m) of the direct auto travel route.
- Facility siting closer to the midway between the suburban fringe and the CBD than to either extreme, with best results typically occurring when facilities are located at least 10 miles (16 km) from the activity centre being served.

- Existence of significant parking costs and/or scarcity of parking in the CBD or other major attractions served.
- Parking is free or substantially discounted relative to prevailing CBD rates.
- Absence of unmitigated security problems (Turnbull et al, 2004).

In addition to the above, the study also indicates that users of park and ride do not like to backtrack, with demand curves from park and ride facilities spreading up to 2 miles (3.2 km) downstream (toward the CBD) and 10 miles (16 km) upstream from each location. The findings also suggest that over 50% of park and ride users come from within about 5 miles (8 km) of a site (Turnbull et al, 2004). This is an important consideration for park and ride siting as well as the spacing of park and ride facilities.

User surveys suggest that attributes of park and ride that contribute to safety, service, and shelter are important when deciding to use park and ride, while adjunct amenities such as convenience retail are appreciated but unlikely to influence use in any major way (Turnbull et al, 2004).

### **Destination Parking Price**

Finally, destination parking pricing plays a significant role in impacting automobile use (drive alone) and the use of other modes including transit. Studies on the impacts of changes in various costs associated with automobile use, such as fuel, parking, and maintenance, indicate that parking prices (and road tolls) have the greatest impact on transit ridership, typically by a factor of 1.5 to 2.0 because these costs are paid on a per-trip basis (VTPI, 2007). A number of research projects have focused on studying the impacts of parking pricing in the CBD and the impacts parking fees have on mode choice, congestion, VMT, and pollutant emissions. Research indicates that increasing the price of parking in the CBD by 10% could result in a reduction in parking in the downtown by over 5%, an almost 4% increase in park and ride use, and about a 3% increase in transit ridership (VTPI, 2007). Other studies indicate that charging fees for parking in the CBD or at one's destination can reduce VMT, emission pollutants, and congestion (VTPI, 2008). Clearly, park and ride strategies must be adopted in conjunction with a parking management plan for the CBD, if not for the entire city.

## **2.4 CAN PARK AND RIDE MEET ITS OBJECTIVES?**

The following summarizes findings from a review of municipalities throughout Canada and the U.S. regarding the impacts that park and ride facilities have exhibited in relation to the objectives of park and ride described in Section 2.1. The below is meant as information and detailed analysis of the following in Edmonton will be completed as a next step as described in Section 5.

**Ridership.** Surveys of cities from the U.S. indicate that 40 to 60% of park and ride users previously drove alone, another 10 to 20% carpooled, and 5 to 25% of trips did not occur at all previous to the park and ride (suggesting park and ride improves the mobility of some users). The same data also indicate that 10 to 50% of park and ride users in some cities were previously transit users. Overall, the data indicate that over half of the ridership generated from park and ride is new ridership and less than half would be diverted from other transit services (Turnbull et al, 2004). In terms of transit ridership generation per parking space, studies in Connecticut have shown that a rough average of 0.2 transit riders are gained for every additional park and ride stall added,

when destination parking supply is constrained (Turnbull et al, 2004; Evans and Pratt, 2007).

**Concentrating Ridership & Increasing the Reach of Transit.** From the statistics presented above, 5 to 25% of park and ride users did not previously make the trip. Therefore, park and ride has the ability to both concentrate transit ridership and increase the reach of transit into areas where transit was previously unviable or unattractive (depending on the location and specific context).

**VMT & Pollutant Emissions.** In terms of park and ride objectives of reducing VMT and pollutant emissions, the closer park and ride facilities are to one's origin, the greater the potential for reduction in VMT and pollutant emissions. If park and ride facilities are located such that a majority of the trip is still made by low-occupancy automobiles, there is limited potential to reduce VMT or pollutant emissions. Reductions in VMT and pollutant emissions can also be counter-balanced to some degree if the majority of travelers attracted to park and ride were previous transit users (Kuzmyak et al, 2003; Turnbull et al, 2004).

**Shifting Parking from CBD.** From the noted results, previous drive alone and carpoolers make up 40 to 60% and 10 to 20% of park and ride users, respectively. This statistic reveals that park and ride can divert parking demand from the CBD to areas with lower land costs, thereby allowing higher value land to be developed into more economically supportive land uses and destinations.

## 2.5 PARK AND RIDE OR TRANSIT ORIENTED DEVELOPMENT?

There is obviously a trade off between maximizing the number of people within walking distance of transit through higher density, transit oriented development (TOD) and facilitating transit ridership through automobile accessibility by providing convenient parking via park and ride facilities. The decision to provide one or the other, or a mix of both, is dependent upon a number of considerations including the station location, existing adjacent development density and diversity, the intended municipal objectives of transit service and urban form, and market demands for land development.

### 2.5.1 Ridership & Timing of Demand

Fehr & Peers (2004) completed analysis of ridership surrounding transit stations using direct ridership models for Bay Area Rapid Transit (BART)/Caltrain, Sacramento Regional Transit, and others. The models considered population and employment surrounding the transit station, population income of surrounding residents, the quality and quantity of transit service provided, the ease and method of access to the transit station, and the amount of parking provided surrounding the station.

The results of the direct ridership models summarized below in Table 1 indicate that larger ridership impacts can be achieved through population and employment densification as compared to providing parking. What this information does not provide is a comparison of the scale/scope of the population versus the number of parking stalls required to generate similar ridership levels. In other words, for a given area, how much ridership can be generated by TOD versus how much can be generated by park and ride.

**Table 1: Ridership Impacts from Changes to Land Development and Transit Service (Fehr & Peers, 2004)**

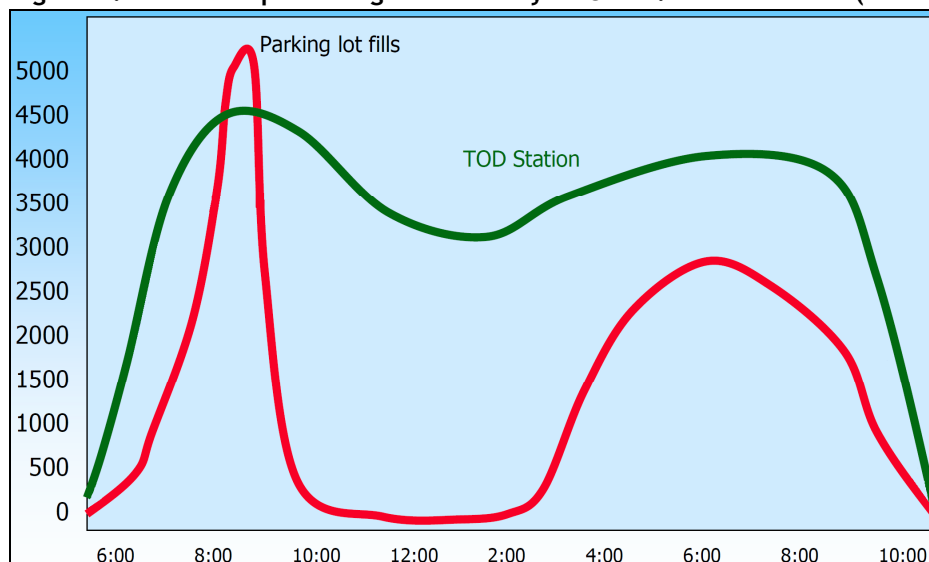
Given a 100% increase in:	Expected Ridership Change	
	BART/Caltrain	Sacramento LRT
Population and employment within ½ mile of station	23%	-
Population within ½ mile of station	-	30%
Employment within ¼ mile of station	-	21%
Number of peak period trains	48%	-
Peak period feeder buses	29%	47%
Parking spaces	4%	11%

An exercise completed by Tumlin (2007) provides a scale/scope-based comparison of the potential ridership demand between TOD and park and ride over the same unit area as summarized in Table 2. From Tumlin's comparison, both park and ride and housing can achieve ridership increases. However, where TOD would provide transit ridership demand throughout the day, park and ride facilities would only provide ridership during the peak commuting periods, primarily due to the high use of park and ride by commuters. Therefore, TOD offers better use of transit infrastructure because there are demands all day. This is further illustrated in Figure 1.

**Table 2: Ridership Potential of Park and Ride versus TOD (Based on Tumlin, 2007)**

	Surface Parking	Parking Structure (3 storey)	Housing	
Parking Spaces or Units per hectare	250	500	125 - 250	250 - 500
Rides per day	500	1000	500	1000
Timing of Demand	Peak Periods	Peak Periods	All Day	All Day

**Figure 1: Transit Trips Throughout the Day - TOD vs. Park and Ride (Based on Tumlin, 2007)**



Analysis of transit ridership characteristics of San Leandro Station (part of the Bay Area Rapid Transit system) was completed to determine what the trade-offs were for redeveloping the site as a TOD from its previous primary purpose as a park and ride station. The analysis indicated the following with respect to ridership on BART:

- 100 TOD dwelling units produced equivalent ridership to 100 parking spaces;
- 100 office employees or 200 retail employees produce equivalent ridership to 100 parking spaces;
- 2 productive bus routes produce the equivalent ridership to 100 parking spaces (Walters, 2006).

A key finding from analysis completed by regional models in other jurisdictions is that *park and ride is not as attractive to the average user as being able to use transit service of equivalent quality somehow delivered within a short walk of their home* (Turnbull et al, 2004).

### 2.5.2 Location/Siting & Transition

The above suggests that TOD has the ability to induce more transit ridership than park and ride. However, not all transit stations can be expected to develop as TOD, or at least not to be developed as TOD initially. TOD may be developed over time, which requires the ability to transition park and ride facilities into higher density developments near the stations.

In locations where TOD is anticipated to develop in conjunction with LRT or premium bus service or where higher density development already exists, any park and ride facilities should be constructed to minimize their intrusion on TOD (should park and ride be warranted). These types of locations include those in existing neighbourhoods and for locations at distances closer to the CBD.

In cases where residential, employment, and/or commercial development is not anticipated for many years, park and ride facilities may be provided initially but will have to be transitioned from surface lots or structures into parking structures or larger parking structures or, potentially, phased out completely. This process requires detailed planning on how the transition would be facilitated and the timing for the transition as well as establishing a parking replacement policy.

Parking replacement refers to the proportion of parking that is replaced when a park and ride facility is transformed. In the San Francisco Bay Area, a one-to-one replacement policy existed for a number of years but is currently being reconsidered such that the number of replaced stalls can be less than one-to-one. Parking replacement for BART stations is recently being calculated utilizing direct ridership models to relate the impacts that different land uses have on transit ridership, allowing the best use of the land from a transit ridership perspective to be identified (Fehr & Peers, 2004; Walters, 2006).

In locations that are long distances from the CBD where the primary role of the LRT station or transit centre may be to intercept regional commuters, park and ride facilities will likely be an integral component of the station design and the primary source of transit ridership. The Appendix of this paper includes case studies of how park and ride sites have been transitioned to TOD in other jurisdictions.

### 2.5.3 Park and Ride Costs and Revenues

Another consideration is cost: property acquisition; construction, operation, and maintenance; and roadway expansions (to accommodate park and ride traffic). Park and ride can be funded by a number of mechanisms however the municipality typically pays for the land acquisition and the facility's construction, operation, and maintenance even under design-build or public-private partnership frameworks. The following highlights the approximate costs for the construction, maintenance, and operation of park and ride facilities in Edmonton (in 2009 dollars) and do not include the costs of kiss and ride, construction of the transit centre or LRT station, or roadway expansion to accommodate access into and out of the park and ride facility.

- Land Acquisition: \$2,500 to \$10,000 per surface stall (assuming 250 stalls per hectare), \$1,250 to \$5,000 per structured stall (assuming a 3 storey structure, and 500 stalls per hectare)
- Gravel Surface Parking Lot Construction: \$1,725 to \$3,400 per stall
- Paved Surface Parking Lot Construction: \$4,500 to \$5,000 per stall
- Parking Structure Construction: \$25,000 to \$40,000 per stall (depending on size and contractor availability)
  - Total Capital Construction cost (including land acquisition):
    - \$4,225 to \$6,000 per stall for temporary surface gravel lot
    - \$7,000 to \$15,000 per stall for surface paved lot
    - \$26,250 to \$45,000 per stall for above grade structure
- Surface Lot Snow Removal: \$40 to \$200 per stall per year (depending on location of snow storage facility)
- Surface Lot Operations and Routine Maintenance: \$65 to \$115 per stall per year (depending on size and type of parking facility and the surface material with less cost for gravel surface lots as compared to paved surface lots; includes cost of lighting and utilities, landscaping, signage, custodial services, painting, and security monitoring)
- Surface Lot Life Cycle Maintenance: \$150 to \$175 per stall per year (includes patching, crack sealing, slurry coating, resurfacing, and overlays; life cycle maintenance of temporary gravel lots not included due to their temporary nature and the expectation that gravel lots would only be in use for 5 years)
- Parking Structure Operations and Routine Maintenance: \$150 to \$200 per stall per year (includes cost of payroll and benefits for attendant, business tax, telephones, payment charges, washing and sweeping, painting/stripping, auto claims and towing, insurance, snow clearing, and miscellaneous costs)
- Parking Structure Life Cycle Maintenance: \$300 to \$350 per stall per year (includes cost of parking deck wear-course materials, slab waterproofing membranes, concrete substrate, drainage systems and expansion joints, corrosion repair, stairwells and stairwell curtainwalls, and pillars and all other structural components)
- Pay Parking Operation / Administration: \$25 to \$30 per stall per year (if fees were charged at surface lot park and ride facilities; no additional cost for structured stalls as attendant included in the operating costs)
  - Total Annual Operation/Routine Maintenance/Life Cycle Maintenance cost:
    - \$130 to \$345 per stall per year for temporary surface gravel lot
    - \$280 to \$520 per stall per year for surface paved lot
    - \$450 to \$550 per stall per year for above grade structure

As discussed in Section 2.4, park and ride facilities generate new ridership for transit systems by attracting users that would otherwise not use transit. Based on Edmonton park and ride use statistics and assuming that 40% of park and ride users previously did not take transit, each park and ride stall would generate approximately \$500 to \$600 per year in transit fare revenue.

TOD can generate greater transit fare revenue for a given area and does not require the high level of civic investment, rather typically only having to put in place the regulations that encourage and allow TOD to be developed by the private sector. In some instances, municipalities may develop property within TOD to meet other objectives such as social housing or to provide certain amenities. The cost of acquiring land, construction of roadway and intersection expansions, and constructing, operating, and maintaining park and ride facilities is another important consideration when developing and implementing a park and ride strategy and determining the relative merits of park and ride versus TOD.

## 2.6 SUMMARY OF APPROACHES USED IN COMPARABLE CITIES

The park and ride practices and approaches used in comparable cities that may provide relevant examples and approaches for the City of Edmonton were reviewed. The review included the following factors.

- Approximate population of area served by transit
- Type of transit service serving park and ride
- System ridership - annual boardings
- Park and ride supply
- Park and ride parking cost
- Parking restrictions at park and ride sites
- CBD parking cost
- Distance from the CBD to the closest park and ride facility
- Minimum distance between park and ride facilities

Calgary, Vancouver, Denver, and Minneapolis were reviewed as summarized in Table 3. Many of the cities have transit systems that serve a metropolitan or regional area that extends past their municipal boundary.

Park and ride is supplied in each of the cities throughout their service regions primarily targeted to commuters in areas removed from the CBD, and are located at transit stations served by rail transit with bus connections or at commuter park and ride sites at distances where buses can operate at higher speeds than light rail (e.g. Denver and Minneapolis). Park and ride facilities were typically located at about 5 km or further from the CBD with the spacing between park and ride facilities ranging widely (likely based on demand).

The size of park and ride facilities varied in all the cities reviewed from under 50 to over 1,500 and appears to be dependent on the distance to the CBD and the type of transit service provided. Smaller facilities are located closer to the CBD and larger facilities are provided at regional commuter stations at the ends of rail transit lines or commuter oriented express bus services.

**Table 3: Park and Ride in Comparable Cities**

	Calgary	Vancouver	Denver	Minneapolis
Approx. Population	▪ 1.25 million	▪ 2.1 million in Greater Vancouver Regional District	▪ 2.3 million in Regional Transportation District (RTD)	▪ 3.2 million in the Twin Cities metro area
Type of transit service	▪ LRT with bus connections ▪ Express bus corridors	▪ Rail transit with bus connections ▪ Bus corridors	▪ LRT with bus connections ▪ Bus corridors	▪ LRT with bus connections ▪ Bus corridors
System ridership	▪ 165.6 million	▪ 303.9 million	▪ 86.6 million	▪ 81.8 million
Park and ride parking supply	▪ 20 to 1,400 ▪ Larger facilities at LRT and locations far from CBD ▪ Total supply of about 14,000 ▪ 33 locations ▪ Bicycle parking provided	▪ 40 to 1,500 ▪ Larger facilities at LRT stations in surrounding municipalities (e.g. Surrey) ▪ Total supply of about 6,000 ▪ 21 locations ▪ Bicycle parking provided	▪ 20 to 1,700+ ▪ Larger facilities at LRT and express bus stations at the ends of lines ▪ Total supply of about 26,800 ▪ 75 locations ▪ Bicycle parking provided	▪ 25 to 1,600 ▪ Larger facilities at LRT stations and transit centres far from CBD ▪ Total supply of about 15,200 ▪ 75 locations ▪ Only 3 sites for LRT (170, 1080, 1550 stalls) ▪ Bicycle parking provided
Park and ride parking cost	▪ \$3 per day Monday to Friday, \$60 monthly pass ▪ \$90 monthly Guaranteed Availability Parking Pass at one LRT lot ▪ \$0.75 per hour for short stay	▪ Free to \$4 per day ▪ Monthly passes and reserved stall passes available \$40 to \$140 ▪ Some facilities closed on weekends	▪ Free parking for first 24 hours ▪ \$1 to \$4 after 24 hours depending on vehicle origin	▪ Free
CBD parking cost	▪ \$3 to \$5 per hr meters ▪ \$6.50 per hr structures/lots	▪ \$1 to \$5 per hr meters ▪ \$1 to \$3 per half hr to max. of \$9 to \$20 per day structures/lots	▪ \$1 per hr meters (2 hour max.) ▪ \$2 to \$18 per day structures/lots	▪ \$1 to \$2 per hr meters ▪ \$7 to \$15 per day structures/lots
Distance of CBD to nearest park and ride	▪ 5 km (small sites, 50 to 150 stalls)	▪ 7 km (small sites, 170 to 325 stalls)	▪ 30 stall site in CBD ▪ Next closest 5.5 km	▪ 4.5 km (small site, 170 stalls)
Minimum park and ride spacing	▪ 1 km ▪ located at almost every LRT station 5 km from CBD	▪ 3 km	▪ 1.5 km ▪ located at almost every LRT station 5.5 km from CBD	▪ 8 km between park and ride facilities at LRT stations

Denver and Minneapolis provide an extensive supply of park and ride both in terms of the number of stalls and number of facilities. Conversely, Vancouver appears to rely more on feeder transit services, walking, or cycling to access their regional and rapid transit services. Calgary falls somewhere in between with a higher supply of parking stalls but not as many park and ride facilities as Denver or Minneapolis (although the population served by Calgary is much lower than these U.S. cities/regions). Most park and ride facilities also supplied bicycle parking through bike racks and/or lockers.

Parking fees associated with park and ride ranged between and within cities from free to a nominal fee that were significantly discounted as compared to the parking fees charged in the CBD. Some fees were charged to discourage long term / overnight use. Calgary is using the fees to pay for safety and security improvements and for saving toward life cycle maintenance costs.

In general, the practices exhibited in the reviewed cities were consistent with the approaches included in the discussion regarding park and ride objectives, characteristics, and the factors that are supportive of park and ride. The consistency extends to characteristics not summarized in Table 3 such as park and ride location in relation to highway congestion and accessibility. The main exception is in the siting of park and ride facilities in the reviewed cities to within 5 km of the CBD or at locations closer to the CBD than to the suburban fringe for which the reviewed research suggests greater success would be anticipated by siting facilities at distances of 10 km or more from the CBD and closer to midway between the CBD and suburbs.

The approaches used by the cities summarized in Table 3 and the factors for successful park and ride facilities summarized in the preceding portions of Section 2 are used to form the City of Edmonton's Park and Ride Strategy / Policy.

### **3. Edmonton's Current Approach to Park and Ride**

The following section outlines the City of Edmonton's current approach to park and ride in terms of planning, design, and operation as well as a review of the current supply of park and ride stalls and the individuals that use them.

#### **3.1 PARK AND RIDE & DOWNTOWN PARKING CHARACTERISTICS**

##### **Edmonton Park and Ride Characteristics**

Park and ride facilities are currently provided in Edmonton at three LRT stations (with connections to buses) and one transit centre served only by buses as summarized in Table 4 and illustrated in Figure 2. From the table, the total supply of parking comes to 2,855 stalls. Most of the facilities are currently at capacity when secondary and post secondary students are in session. The park and ride at Belvedere is currently being expanded to include 500 stalls of at-grade parking at an existing temporary location, resulting in a net increase of 350 stalls. Additional park and ride facilities are also used in conjunction with special events, particularly for football games, at a total of six lots spread throughout the city.

**Figure 2: Existing Edmonton Park and Ride Facilities**



**Table 4: Edmonton Park and Ride Facilities**

	Transit Service	Capacity (May/09)	Utilization (Oct/08)
Clareview Station	LRT and bus	1,416	105%
Belvedere Station	LRT and bus	683	88%
Stadium Station	LRT and bus	558	100%
Heritage / Century Park	Bus (LRT in 2010)	198	118%

Edmonton Transit currently has about 105.8 million boardings per year and 360,000 per weekday. Of the weekday transit riders, about 3% are generated from park and ride users. For comparison, about 18% of Denver's transit riders are generated from park and ride, Minneapolis generates about 8%, and Vancouver only generates between 1% and 2% of its ridership from park and ride (from discussions and information provided by Regional Transportation District in Denver, Metro Transit in Minneapolis, and TransLink in Vancouver).

The City of Edmonton is also at varying stages of planning, design, and construction of park and ride facilities for Heritage Valley (Ellerslie Road / 127 Street with express bus service to Century Park LRT), Lewis Estates (87 Avenue / 199 Street), Gorman (near 153 Avenue / Fort Road), The Meadows (38 Avenue / 17 Street), and Windermere (Windermere Boulevard / 170 Street), all of which are located in or near the TUC / Anthony Henday Drive and are generally consistent with those recommended in the Capital Region Intermunicipal Transit Network Plan.

Park and ride is currently provided free of charge. There are bicycle racks at most LRT stations and transit centres and a pilot project of bicycle lockers at South Campus Station will review the use of this more secure bicycle parking option. Preferential carpool parking spaces are also currently being provided on a trial basis at each LRT station park and ride facility.

Edmonton's Stadium Station park and ride is only 3.5 km from downtown, Belvedere Station park and ride is about 5 km from Stadium Station (8.5 km from downtown), and Clareview Station park and ride is about 2 km from Belvedere (10.5 km from downtown). The Century Park / Heritage Transit Centre park and ride is 11 km from downtown and 8 km from the University of Alberta.

The park and ride facilities are located with access from arterial roads leading toward the downtown and University. In particular, Clareview Station, Belvedere Station, and Century Park / Heritage Transit Centre are located along major commuter routes from suburban Edmonton and municipalities within the Capital Region with good visibility of the lots from the roadways. Most of the park and ride facilities are designed such that walking distances to the LRT station and transit centre are within 200 to 300 m, with the exception of Belvedere Station.

About 85% of park and ride uses at Clareview Station are from Edmonton, while about 15% are from outside Edmonton within the Capital Region. Similar usage is found at the other park and ride facilities. Of the park and ride users generated from within Edmonton, most come from within a 4 km radius of the park and ride facilities. Usage by Edmonton residents shows that very few individuals choose to backtrack to a park and ride facility and would rather go to one along their way toward the downtown and University. The catchment area of LRT station park and rides overlap due to the spacing of the lots.

### **Edmonton Downtown Parking Characteristics**

Currently, Downtown Edmonton has a supply of about 1,600 on-street parking spaces, 1,300 of which are metered. There are also about 32,500 off-street parking stalls for use by employees and business patrons located in surface parking lots or parking structures. The price of this parking is varied with commercial patron parking being primarily short stay parking paid by the hour and in a few cases free, while employee

parking can be either paid monthly or be provided free of charge. The availability of these stalls directly impact transit ridership and mode choice including park and ride use and the ability to charge fees for park and ride to offset operation and maintenance costs of the facilities.

Research shows that the price of parking has a very significant impact on mode choice (VTPI, 2007). The abundant supply and relatively inexpensive price of parking in the downtown and areas surrounding the downtown make driving a convenient and affordable choice for many Edmontonians, while making transit a less attractive alternative.

### 3.2 PARK AND RIDE APPROACHES & FACILITIES PROPOSED BY EDMONTON PLANS

A number of City of Edmonton plans and studies were reviewed to determine previous direction and approaches to park and ride in Edmonton including proposed locations. The consulted strategic documents include:

- Transportation Master Plan, 1999
- Draft Transportation Master Plan: The Way We Move, 2008 & 2009
- High Speed Transit Planning Study, 2004
- LRT Design Guidelines, 2005
- Long Term Public Transportation Strategy, 2008
- ETS Ridership Growth Strategy and Planning Review - Summary Report, 2008
- Capital Region Intermunicipal Public Transit Network Plan, 2009

Documents reviewed pertaining to specific LRT and high speed transit services include:

- Report 2003TS5967 - South LRT Extension - Parking Facilities at Neil Crawford LRT Station, 2003
- South LRT - Park and Ride - South LRT Extension Fact Sheet, 2008
- Report 2009TD8712 - South LRT Park and Ride, 2009
- South LRT Extension - Preliminary Engineering - Ellerslie Park and Ride Fact Sheet, 2009
- North High Speed Transit (Downtown to NAIT) Concept Planning Study, 2005
- Century Park to South City Limits / Clareview to Northeast Edmonton Preliminary Concept Plan Report, 2007
- West High Speed Transit Study - Bus Rapid Transit / Transit Priority, 2008
- Southeast Transit Priority Corridor, 2008

The reviewed strategic-level and specific service documents included the following general guidance with respect to park and ride facilities.

- Park and ride should be provided on major transportation corridors served by frequent and direct service to the downtown and/or University in areas underserved by local transit.
- Park and ride facilities should be located at outlying transit centres or LRT stations near roadways carrying regional traffic, such as near Anthony Henday Drive or at locations with access to the Inner Ring Road (Yellowhead Trail and Whitemud Drive), to allow automobile access to transit service (demand is

- expected to increase as the distance to the downtown and University increases).
- Park and ride should be developed on land where more intensive development is not possible or feasible.
  - Park and ride should be no closer than 5 km to the downtown area.
  - Park and ride should have good roadway access leading to the facility.
  - Total transit travel time from park and ride to the downtown should be equal to or less than the travel time by automobile.
  - The percentage of the travel time on transit should represent more than 50% of the total journey time.
  - Walking distances from parking lots to LRT stations should be within 250 m.
  - Park and ride facilities should not exceed 1,400 stalls to maximize the effectiveness in attracting users and moderating walking distances.
  - Park and ride should be well lit and have plug-ins.
  - Secure, weather protected bicycle parking should be provided at major transit centres to permit bicycle access to transit service.

Existing park and ride facilities meet most of the above guidance with the exception of Stadium Station park and ride which is within 5 km of downtown and lacking particularly direct access to major transportation corridors. In general, the guidance is consistent with the 'Indicators of Success' for park and ride presented in Section 2.3. The above information and the 'Indicators of Success' are used in the following section to present the Transportation Planning Branch's proposed position on park and ride.

## 4. Park and Ride Position

Based on the literature review, practices used in other municipalities, and Edmonton's current approach to park and ride, the following presents the Transportation Department's position on park and ride. Further analysis will be completed as specified in Section 5 to finalize the Park and Ride Policy Procedure.

### 4.1 PARK AND RIDE OBJECTIVES

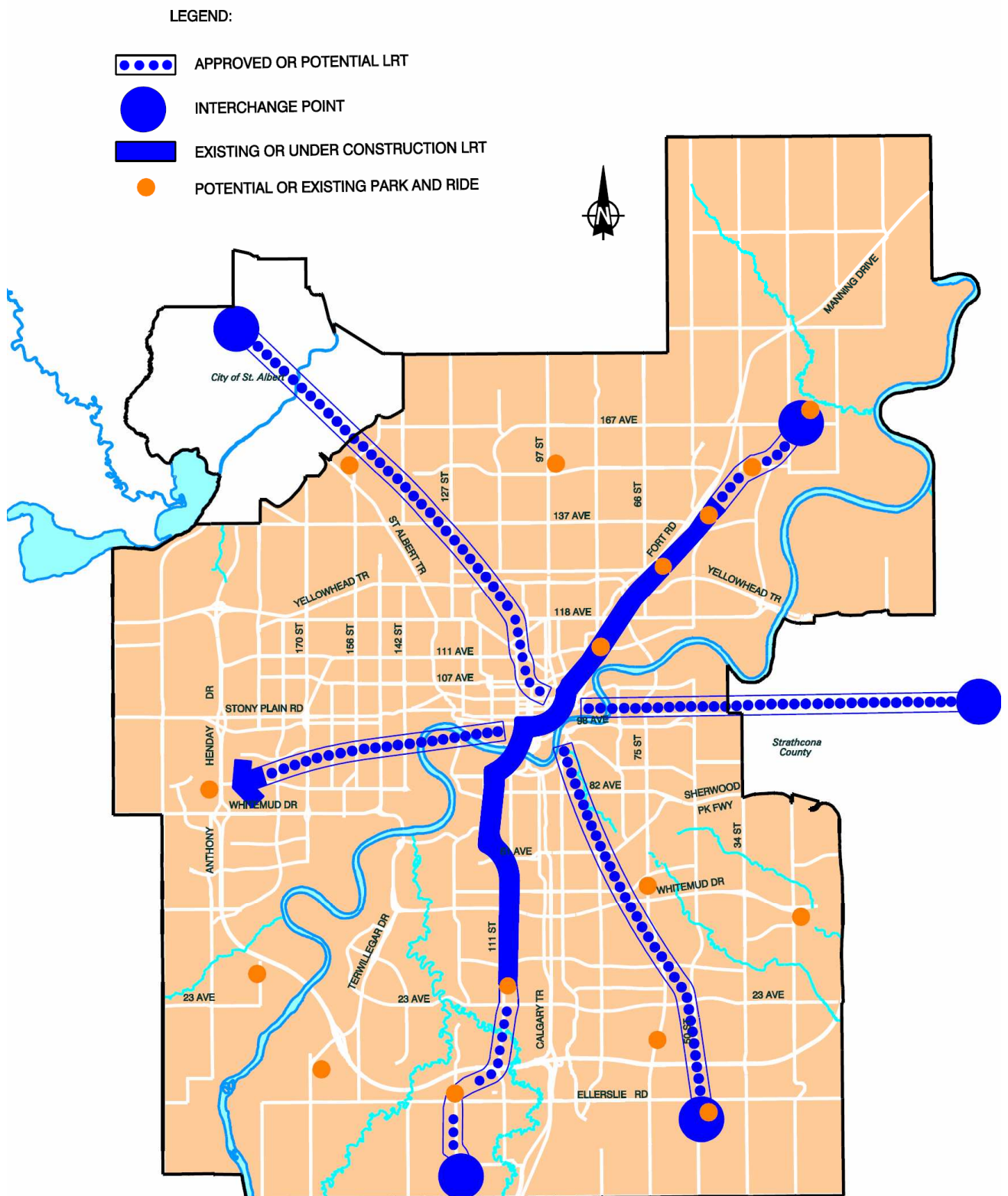
Park and ride will be provided to reduce roadway congestion and increase transit ridership by shifting people from private automobiles to transit. Park and ride will be provided to primarily target trips to Edmonton's downtown and University areas by intercepting commuter trips from regional areas and increasing the attractiveness of public transit for those living in areas with population densities that do not support feeder or regular bus services. Park and ride will also be used to accommodate travel to special events.

### 4.2 LOCATION / SITING

Park and ride facilities will be located based on the following:

- Located at LRT Stations or Transit Centres served by LRT, premium bus, or express bus services with feeder routes or interchanges from/to local routes.
- Located in areas along or outside of the Inner Ring Road (Yellowhead Trail, 170 Street, Whitemud Drive, and 75 Street/Wayne Gretzky Drive) and preferably at least 8 km from the downtown or University of Alberta North Campus.
- Located with direct access to/from the park and ride site within 800 m of major commuter/regional routes (Anthony Henday Drive or arterial roads).
- Located primarily at sites where more intensive development is not possible or feasible such as the Transportation Utility Corridor or other major utility rights of way or where such development is not expected to occur in the immediate future.
- Spacing between park and ride sites should be a minimum of 2 km.
- Figure 3 illustrates potential locations for park and ride facilities within Edmonton. The locations are consistent with those identified in the Capital Region Intermunicipal Transit Network Plan. These and additional locations will be further explored based on consultation and discussions with the Provincial Government and the Capital Region Board.
- Constructability and ability to provide adequate access to park and ride facilities will be critical during detailed evaluation and planning of locations.

### Figure 3: Potential Park and Ride Locations



#### 4.3 SIZE

The size of park and ride facilities will be based on the following:

- Size of park and ride facilities will be based on projected demands determined by direct demand models or the Regional Travel Model as well as land constraints.
- Maximum number of parking stalls at a facility will also be based on vehicle access, internal circulation, walking distances, and the surrounding roadway capacity impacts of each proposed site.
- Bicycle parking will be provided at all LRT stations and transit centres in the form of bicycle lockers or parking of a similar level of security.

#### 4.4 PARKING FACILITY DESIGN / LAYOUT

Park and ride facilities will be designed based on the following:

- Park and ride facilities can be surface or structured depending on the surrounding land uses.
- If park and ride are located in TOD areas, parking structures should be provided with architectural treatments, and potentially main floor or wrapping of development, that reduces the conspicuity of the facility and allows it to blend in with the character of the surrounding land uses (See Appendix). Alternatively, if economic conditions do not allow, surface parking could be provided in multiple smaller lots oriented into smaller block structures to limit the impacts on TOD urban form and provide direct pedestrian connectivity.
- Pedestrian access: Park and ride facilities should be within 250 m of the LRT station and/or transit centre platform.
- Transit transfers: Bus and LRT platforms should be designed to minimize transfer distances and improve ease of transfers between modes.
- Carpools and bicycles: Carpool parking and bicycle parking should be located with closest proximity to the LRT station or transit centre of all parking stalls (other than disabled parking stalls).
- Kiss and ride: Passenger drop off/pick up facilities should be provided such that transfers from automobiles to transit should be within 75 m of the LRT station or transit centre platforms.
- Amenities: All pedestrian accesses must have pedestrian level lighting. Shelters and benches should be provided at every park and ride facility. Electric plug-in may be considered, and could require users of electrified stalls to pay a fee to cover the costs of electricity. Convenience retail and other amenities could also be included at stations.

#### 4.5 PARKING FEES

The following outlines considerations related to user fees for park and ride facilities:

- Charging for regular stalls is highly dependent on the parking cost and supply at destinations, particularly the downtown. The timing of charging parking fees at park and ride facilities will be further evaluated as described in Section 5 based on the projected parking costs in downtown Edmonton.
- The amount charged for park and ride parking fees will be based on the amount of annual funding required to operate the facilities and to contribute to their life cycle maintenance, and should be based on market conditions. This rationale must be clearly communicated to the public.
- Consideration should be given to providing reserved stalls, guaranteed stalls, or 'premium parking' to users for a fee, which could include electrified stalls.
- Carpool users may or may not be charged for parking at park and ride (and registration as a carpool would likely be required).

#### 4.6 PARKING FACILITY OWNERSHIP AND OPERATION

The following presents responsibilities for ownership and operation of park and ride:

- The City of Edmonton should own all permanent park and ride facilities to allow for future control of their use and the land on which they are built.
- Operation of park and ride facilities could be under City of Edmonton control or a third party. Evaluation of the merits of operating models will be completed as part of the next steps described in Section 5 including consultations with Corporate Properties Branch and Edmonton Transit.
- Park and ride facilities can be shared-use during evening and weekends to support businesses in the station area, with stalls located nearest the station entrance reserved for park and ride all day.

#### 4.7 TRANSITION WITH TOD

Transitioning park and ride facilities to TOD should consider the following, particularly at locations with the greatest TOD potential (See Appendix for examples):

- Land immediately adjacent to the LRT station or transit centre with premium bus service should be developed as TOD.
- When TOD is proposed or considered at a park and ride facility, the amount of park and ride parking that is replaced should be based on ridership objectives and the impacts that replacing parking could have on the ability to develop the proposed TOD. Direct ridership models could be used to identify the land uses (including park and ride) that would maximize transit ridership at the station. The result could be that park and ride parking is not replaced.
- Park and ride facilities within TOD areas should blend into the development character.
- Surface parking lots should be discouraged in areas where TOD will be developed. However, if surface lots are constructed due to market conditions or other circumstances, the drive aisles should be designed and oriented such that they can be used as streets in the future when the TOD uses are developed.

- If park and ride facilities are constructed on a site of a future TOD, park and ride should be explicitly defined as an interim use of the land and be communicated to the public through on-site signing and other approaches.

#### 4.8 DESTINATION PARKING MANAGEMENT & OTHER ELEMENTS

The following elements and considerations are required to provide an effective park and ride strategy:

- The supply and resulting cost of parking in Edmonton's downtown must be actively managed in order to achieve transit ridership and park and ride usage objectives.
- Effective feeder bus service is required from areas surrounding LRT stations and transit centres served by premium bus services including appropriate frequency, routing, and travel times such that use of feeder service is attractive to residents.
- The City of Edmonton should take an active role in establishing TOD supportive zoning as well as adjusting parking, transportation (e.g. trip generation), and other regulations or procedures that are currently limiting the marketability and affordability of TOD.

## 5. Required Next Steps

The following presents actions to finalize the Park and Ride Policy Procedure.

- Complete Regional Travel Model runs evaluating park and ride scenarios including further analysis of the impacts that charging a fee would have on park and ride use, transit ridership, greenhouse gas emissions, and vehicle kilometres travelled based on varying downtown parking rates and fuel prices.
- The ability to provide access to the park and ride sites will also be considered when determining location and siting and may result in certain locations being removed from consideration.
- Negotiate use agreements for lands in the TUC for park and ride, if necessary.
- Establish parking replacement methodology for the transition of park and ride to TOD. This would include identifying policy and context issues that affect TOD, building scenarios with respect to TOD, parking, and transit access strategies, and evaluating the scenarios based on ridership and financial impacts.
- Finalize park and ride ownership and operation model through collaboration with Corporate Properties Branch, Edmonton Transit, and Transportation Planning.
- Develop Station Area Plans for stations with the highest TOD potential.

## 6. List of References

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## **APPENDIX A: Park and Ride to TOD Transition Case Studies**

## INTRODUCTION

The following presents successful examples of how park and ride sites have been transitioned into transit oriented developments (TOD), how TOD and park and ride can both be accommodated, or how the station areas have been planned and designed such that the transition can occur.

## EXAMPLES

### **Pleasant Hill Station, Contra Costa County, California**

The Pleasant Hill Station is located in Contra Costa County, California just north of the City of Walnut Creek. The station is served by Bay Area Rapid Transit (BART) commuter rail with connections to Oakland and San Francisco as well as local transit services provided by Contra Costa County Transit Authority.

A Comprehensive Plan for the Pleasant Hill Station was completed in 2002 for the Contra Costa Centre Transit Village that supported the ongoing community planning efforts to transform the station and surrounding area lands owned by BART into a vibrant centre for residents, businesses, and transportation. Originally designed as a park and ride suburban station serving low density, single family homes with good access to regional commuter roads since the station was developed in the 1970s, the station area had changed into an area with office buildings, apartment complexes, and urban-style lofts. The area immediately adjacent to the station, however, had retained its park and ride character which impacted ridership with lower than system average use throughout the day and supported vehicle access to the rail station over other modes. Drive alone access to the station represents 61% of riders in the AM peak period.

To allow the land adjacent to the station to better integrate with the surrounding development, enhance all day transit ridership, and balance mode of access, the Contra Costa Centre Transit Village concept was created. The development concept outlined the development of office, retail, and residential uses on lands previously used as surface park and ride lots. The park and ride stalls would be replaced (one-to-one based on BART policies) in a parking structure attached to the existing structure on one side of the station. The delay in development of TOD on these lands was in part due to the high cost of the one-to-one parking replacement policy and the impacts it would have on the profitability of development and the affordability of rents for tenants. To allow the concept to proceed, the Contra Costa County Redevelopment Agency agreed to pay for the park and ride replacement and the construction of a parking structure. This removed the cost burden from private developers and allowed the Transit Village concept to advance.

The parking structure has been constructed (June 2008) and is wrapped with “active” development - residential and commercial space on the edges with the parking structure at the centre - to limit the visual impact of the parking structure. The following figures illustrate the original site and the site following the expansion of the parking structure.

# ORIGINAL PARK AND RIDE SITE



# EXISTING SITE WITH PARKING STRUCTURE EXPANSION



Phase I of the Transit Village (Blocks A, B, C, and E illustrated in the figure on the following page) will include the development of 422 residential apartments, 100 for-sale town homes, and 35,590 square feet of retail. The condominium component of Phase I has been delayed due to the current economic situation and is not expected to start construction until mid-2010. Phase II of the project (Block D) will include a 290,000 square foot office building including a 20,000 square foot business conference centre. Construction of Phase II is anticipated within 5 years.

Other than the 100 for-sale condominium units, the developed properties will be owned by private developers but will be located on leased land. The developments will pay the equivalent of property taxes as well as ground lease rents. The revenues from the ground lease rents are split between BART and the County.

PLEASANT HILL / CONTRA COSTA CENTRE TRANSIT VILLAGE TOD PLAN



## Mockingbird Station, Dallas, Texas

Mockingbird Station is located in suburban Dallas and was the first mixed use project designed and built around a rail-based transit station in Dallas served by Dallas Area Rapid Transit (DART). It continues to provide a successful example of TOD for further developments at DART stations throughout their system. The area surrounding the Mockingbird station was previously an underutilized site west of the station and a park and ride site located east of the station. The Mockingbird Station provides an example of how TOD and park and ride can be initially accommodated at the same station in the near term.

The following text was taken from the Urban Land Institute website and is an ULI Award Finalist (<http://casestudies.uli.org/>). More information regarding the Mockingbird Station development can be found at [www.mockingbirdstation.com](http://www.mockingbirdstation.com).

Mockingbird Station has achieved what many once thought was impossible: it has convinced middle class, automobile-driving residents to use transit. The transit oriented development (TOD) – containing 178,000 square feet (16,536 m<sup>2</sup>) of retail, restaurant, and cinema space; 137,000 square feet (12,727 m<sup>2</sup>) of office space; and 211 loft apartments – is immediately adjacent and connected to one of the largest stations on the Dallas Area Rapid Transit (DART) rail line. The station also offers connections to bus, taxi, and shuttle service. Located four miles north of downtown Dallas, the ten-acre (4 ha) project makes use of very dense zoning. Its approximately 500,000 square feet (46,450 m<sup>2</sup>) of rentable building area are unprecedented in density outside of Dallas's central business district. *[Note: The station also includes 1,580 parking spaces for TOD tenants and patrons, most of which is located in an underground garage that is wrapped in retail and integrated into the development. There are also a total of 750 park and ride stalls at Mockingbird Station east of the TOD development.]*

Mockingbird Station combines adaptive use with new construction. Two existing structures – including a historic Western Union telephone assembly building and an office building, which has been expanded – constituted the project's base. The developer made the design decision to place the project's "front door" at the rail station platform rather than along the freeway exposure, and to give the project the same name as the station. The result has been that customers and other visitors clearly see how they can get to and from the project by train, and many patrons regularly use DART.

The project's many inventive, cutting-edge features made it difficult for the developer to obtain approvals, infrastructure improvements, financing, and retail tenants. The City of Dallas was ill prepared to consider the project's unusual traffic and access issues, given its adjacency to transit, while the transit authority was inexperienced in dealing with the needs of developers; construction was thus delayed by several months. Extraordinary efforts were required to obtain both short- and long-term equity and debt funding. The developer had to pay for all road improvements and for the full cost of connecting the project to the rail platform. The developer received no reimbursement from the public sector for assuming these costs, and the project benefited from no special tax districts or permit abatements. The developer was able to obtain, on behalf of the city and the transit agency, federal funding for

off-site pedestrian access improvements to the area. Overall, relentless efforts were needed to “sell” the project to government officials, lenders, and prospective retail tenants alike.

Complete since July 2001, the first phase of Mockingbird Station has proven remarkably successful, particularly since TOD was an untried concept in Texas. Residential occupancies have consistently outpaced the market, with above-average rents for the area. The retail and office space are, respectively, approximately 88 and 92 percent occupied. Future phases are expected to include a hotel and additional retail or residential uses. Mockingbird Station has proved to city, county, and state officials that a properly conceived mixed use TOD can succeed and flourish by serving the adjacent neighborhood while acting as a catalyst to increase transit use.

#### MOCKINGBIRD STATION TOD



#### MOCKINGBIRD STATION TOD



## **Heritage Valley, Edmonton, Alberta**

Heritage Valley is a neighbourhood and town centre site located in suburban Edmonton. The neighbourhood will be served by Edmonton Transit System's South LRT and is being planned and constructed to be transit oriented while also providing park and ride facilities for use by regional commuters.

While the future demand for transit will be derived from TOD surrounding the town centre, development will take time and transit ridership derived from park and ride users already exists. To address the issue of development timing, the land use plan locates the park and ride site near the LRT station, but designates it as an interim use. The intent is to provide the opportunity over time to develop the park and ride site as TOD when market demand warrants. The drive aisles of the park and ride surface lot will be constructed to reflect future streets, allowing TOD development to occur incrementally. One important element in this strategy is to ensure that the transitional expectations are understood from the start by the public, City Administration, and City Council so that it is clearly understood that parking may not be available in the future.