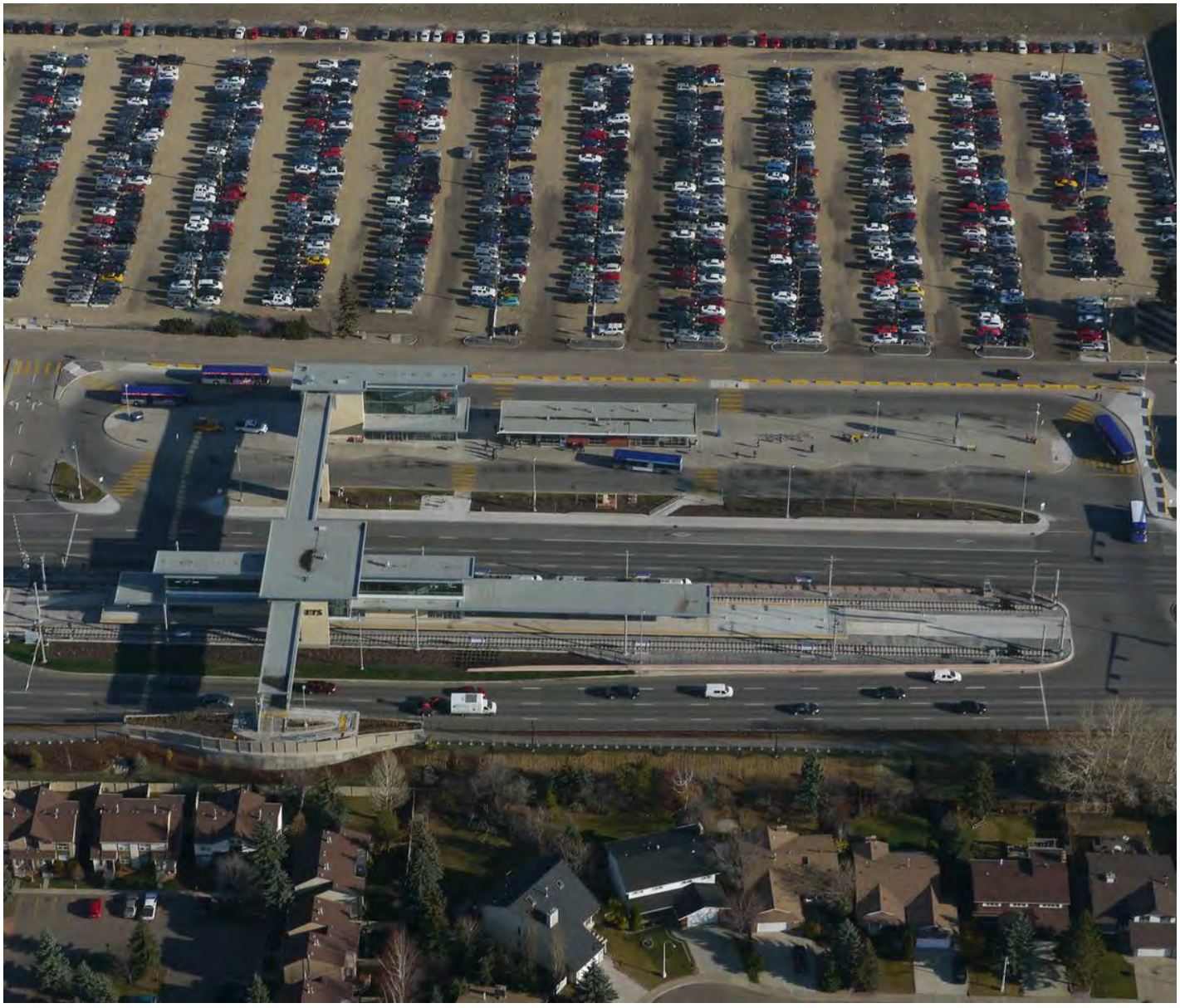
steer davies gleave

Park and Ride - Best Practice Review

Final Report
March 2017

City of Edmonton

Our ref: 23083601



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1 Introduction

1.1 Park and Ride facilities provide an opportunity for car drivers to transfer to a high-occupancy mode such as rail, LRT (Light Rail Transit) or bus for onward travel. The overarching aim of Park and Ride is typically to provide the benefits of transit to suburban and out-of-town locations where lower densities result in low levels of transit provision and high levels of car use.

1.2 This report provides a review of Park and Ride best practice across a range of cities and transit systems. The aim of this review is to aid the City of Edmonton in developing a Park and Ride/Access strategy for key interchange and terminus locations within the transit network. This review identifies the Park and Ride strategies to prioritize within the context of the City of Edmonton.

1.3 This review is structured in the following way:

- **Chapter 2** provides a review of best practice including the following Park and Ride subject areas:
  - objectives;
  - location including site selection, public/private, parking form and on-street parking;
  - pricing;
  - lot size;
  - local feeder services;
  - Transit Oriented Development (TOD); and
  - key performance indicators.
- **Chapter 3** provides case studies on Park and Ride policy in other cities;
- **Chapter 4** provides a review of Edmonton Park and Ride facilities; and
- **Chapter 5** provides a prioritization of strategies.

1.4 A list of the source material reviewed for this report is contained in Appendix A.

2 Best Practice Review

Overview

2.1 Park and Ride facilities have become an integral part of the transportation network in many North American cities. They enable cars and transit to work together to extend the reach of traditional transit services to low density residential neighbourhoods poorly served by transit.

2.2 Mixed mode trips combining cars and transit account for a substantial proportion of transit trips in many cities across Canada and the USA. Therefore, Park and Ride facilities can contribute substantially to the viability and effectiveness of transit systems.

Figure 2.1: Park and Ride Site at Clackamas Town, Portland, OR, USA

Source: SDG

Objectives and Consequences

Objectives of Park and Ride

2.3 Typical objectives for the provision of Park and Ride facilities include [20]:

- a reduction in the number of single-occupancy vehicle km travelled in the city;
- concentration of travel demand to a level enabling transit service to be provided that would not otherwise be viable;
- extending the reach of higher order transit services such as subways and light rail;
- offering a convenient and safe parking location for drivers to transfer to transit;
- reducing vehicle km travelled and therefore air and noise pollution;
- shifting of parking away from downtown areas reducing downtown congestion and demand for parking freeing up land for other uses; and
- minimizing disruption to local residents and businesses from informal on-street parking and parking in private lots near stations.

Potential Negative Consequences of Park and Ride

2.4 The decision to provide Park and Ride can have a number of negative consequences on a city and its transport network. This can include [4]:

- the financial cost of providing parking. Depending on land values the annual cost of building and maintaining a parking facility ranges from approximately $300 to $5,000 per stall. Some of these costs can be recovered through parking fees, however this discourages the use of Park and Ride and therefore many stalls are provided free or at a substantial subsidy;
- use of high value land next to a station that might otherwise be used for high density, Transit-Oriented Development.
- extending the reach of high-order transit services encouraging the development of low-density residential areas encouraging car use;
- traffic, noise and aesthetics of parking can make stations less attractive for development;
- parking can create a poor environment for pedestrians and cyclists discouraging the use of active modes to access the station;
- parking encourages passengers to drive to the station as opposed to using local transit; and
- the provision of parking only benefits higher socio-economic groups who can afford to drive at the expense of low income, disabled and elderly transit users.

2.5 Through the use of best practice guidance, the objectives of Park and Ride can be met with many of the negative consequences mitigated. The following guidance sets out the Park and Ride best practice acquired from a review of the existing literature and Park and Ride operations.

Location

2.6 Park and Ride facilities are most successful where car travel to a popular destination such as a downtown is inhibited by congestion, tolls or a lack of affordable parking. Therefore, successful Park and Ride sites should provide faster, reliable and cheaper journeys than driving.

2.7 Park and Ride facilities should therefore be provided where one or more of the following factors apply [21]:

- population densities are too low to support frequent transit services (i.e., where rush hour connection headways exceed 15 minutes);
- the station catchment area is not served by local bus services;
- locations are at least 8 to 12km from the city center;
- locations are perceived as safe by users;
- facilities are less costly to provide than special feeder bus service;
- facilities are located near the confluence or terminal points of main highways;
- suitable vehicle access can be provided; and
- main highway corridors are congested and Park and Ride facilities can be provided in advance of the congestion.

Site Selection

2.8 Potential Park and Ride sites should be assessed in terms of the following factors [21]:

- availability;
- access;
- visibility;
- physical feasibility;
- environmental impacts; and
- development costs.

2.9 Sites should be compatible with surrounding land uses and be well used relative to the development costs. Land already used for parking or surplus unused land in public or private ownership should be given priority. Sites should be suitably sized, flat and well-drained to reduce development costs. Park and Ride facilities should not be located in high density areas or town centre locations.

2.10 Table 2.1 provides sample site characteristics at five existing Park and Ride sites in North America. These well-used sites are located some distance from the urban core and tend to be easily accessible from the highway network.

Table 2.1: Characteristics of Some Popular Park and Ride Sites

Urban Area		Calgary, AB	Dallas, TX	Edmonton, AB	Philadelphia, PA	Toronto, ON
Transit System		Calgary Transit	DART	Edmonton LRT	SEPTA	GO Transit
Station		Crowfoot	Mockingbird	Clareview	Cornwall Heights	Bronte
Straight Line Distance from:	City Centre	15km	5km	8.7km	23km	40km
	Approximate Edge of City Built Up Area	4km	40km	3.9km	10km	7km
	Highway	0.2km	0.5km	2.2km	0.3km	1km
Transit Service:	Mode	Light Rail	Light Rail, bus	Light Rail, bus	Commuter Rail	Commuter Rail
	Peak Hour Frequency	12 trains per hour	12 trains per hour	8 trains per hour	4 trains per hour	4 trains per hour
Lot Capacity		1,345	750	1,393	1,600	2,623
Weekday Lot Occupancy		1,200	750	1,393	725	2,100

Source: [21, 39, 65, 131]

Public and Private Lots

2.11 The vast majority of Park and Ride lots across North America are owned and operated by the local transit authority or the local municipality.

2.12 For example, in Metropolitan Vancouver there are 18 Park and Ride lots, 50% of which are managed by the local transit authority, TransLink, with the other 50% being managed by the respective municipalities [130].

2.13 In Calgary there are 25 Park and Ride lots providing approximately 17,500 stalls of which 20 lots (90% of stalls) are managed by Calgary Transit with five lots (10% of stalls) being privately operated [39].

Shared Parking Lots

2.14 The provision of Park and Ride through the shared use of parking lots located near transit stations has the capacity to [39]:

- reduce the need for the transit authority or municipality to construct and operate parking;
- reduce the total amount of parking required in the station area; and
- provide revenue opportunities for private land owners to offset some of their parking costs.

2.15 Parking lots which are particularly attractive as shared Park and Ride lots are those which typically see peak parking demand outside peak commuter hours. Therefore, parking lots for leisure (i.e. stadiums) and retail (i.e. shopping malls) uses, which are busiest at the weekend; or churches, which are busiest on Sundays, could be utilised as commuter Park and Ride lots during the week.

2.16 City zoning and municipality regulations can prevent the shared use of parking lots which often must be reserved for the exclusive use of the development site. However, land use policy relaxations are possible and could be incorporated into revised land use policies, particularly for new developments.

2.17 In Calgary a number of private parking lots are also operated as Park and Ride sites including [39]:

- The 900 stall North Pointe Park and Ride lot serves BRT Route 301 customers on weekdays and is also used by customers of the adjacent theatre and shopping mall during evenings and weekends. The theatre paid for the construction of the lot in return for use by their customers.
- The 200 stall Park and Ride lot at Rundle station is provided by Sunridge Mall. The parking is the least desirable for mall customers since it is located furthest from the mall entrance and only needed a few times each year. This parking is located immediately adjacent to the LRT station so it is very attractive for LRT customers. This parking was a condition of the original development agreement.
- Marlborough Mall provides 150 Park and Ride stalls at Marlborough station, also a development condition.
- Canadian Tire provides 50 parking stalls at Richmond Rd and 51 St SW for customers to access several bus routes.
- Parking stalls are provided by the Harvest Hills Alliance Church and the Huntington Hills Community Centre for BRT Route 301 customers.

2.18 To help accommodate an expansion in the number of Park and Ride stalls offered in Jacksonville, Florida the use of existing lots for shared Park and Ride use was investigated. Before Park and Ride operations can commence a number of issues need to be resolved with the lot owner including [115]:

- Will a lease agreement be required to pay for the stalls? Or, if there is a parking charge is a revenue sharing agreement required?
- Who is responsible for installing and maintaining additional signs and amenities?
- Are access and circulation improvements required and who is responsible for associated costs?
- Will there be designated Park and Ride stalls?
- How will maintenance and operations be managed and financed?
- Will transit vehicles enter the property?

2.19 A sample legal agreement covering many of the likely issues is provided in the Appendix of the source report [115].

Parking Form

2.20 To maintain the affordability of Park and Ride development costs should be kept to a minimum. Typically, this will involve the provision of a medium to large surface level lot.

2.21 However, where land values are high, the size of the site restricted or the site is earmarked for Transit Oriented Development (TOD) a parkade may be required.

2.22 Table 2.2 provides an estimate of the build and operation costs of car parking based on data from Calgary.

Table 2.2: Estimated Land, Construction and Operating Costs of Parking in Calgary

	Surface Parking Lot	Parkade
Land Costs		
500 Stalls	5 Acres $5 million	1 Acre $1 million
Per Stall	$10,000	$2,000
Construction Costs		
500 Stalls	$2.5 to $7.5 million	$25 to $40 million
Per Stall	$5,000 to $15,000	$50,000 to $80,000
Operating Costs		
500 Stalls	$412,000	$1,037,500
Annual – Per Stall	$825	$2,075
Per Weekday – Per Stall	$3.30	$8.30

Source: [39]

2.23 Table 2.2 shows that while the land costs may be lower for a parkade than a surface lot, the construction and maintenance costs are significantly higher. In many instances it is unlikely that Park and Ride users would be prepared to pay the full costs of parkade provision given its cost relative to transit fares and city center parking costs.

Figure 2.2: Surface Park and Ride Lot at Richmond Hill, Greater Toronto, ON

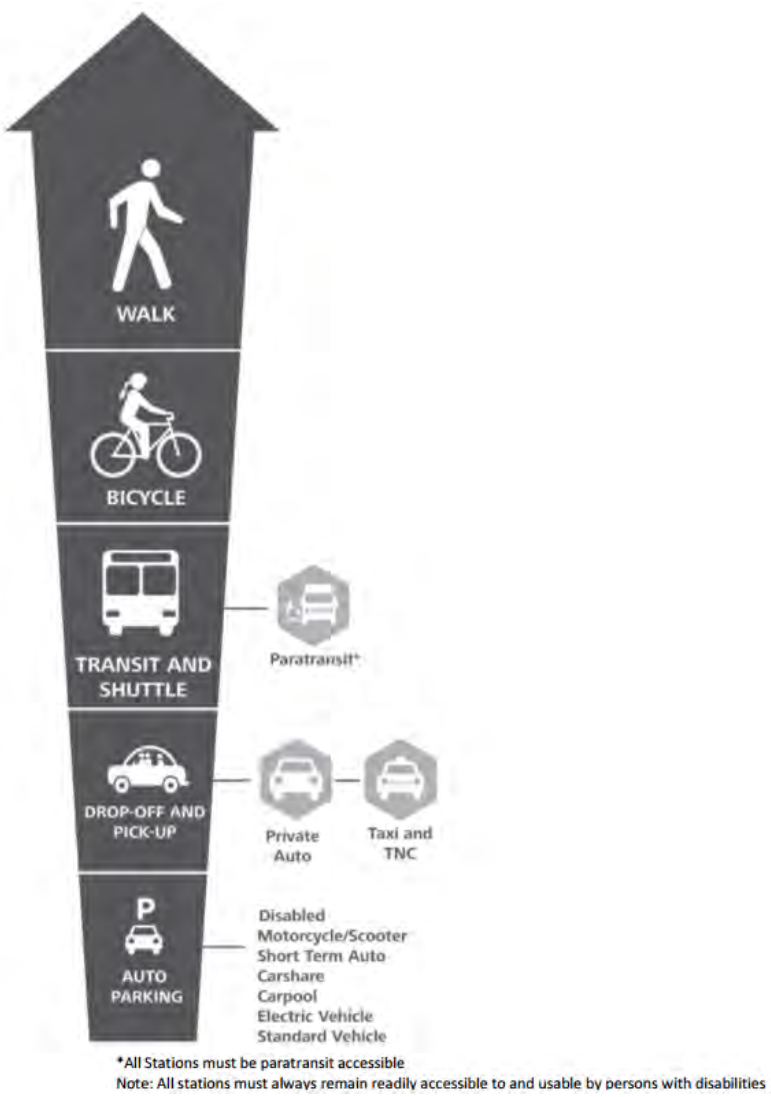
Source: SDG

2.24 If not already present at the station consideration should be given for complimentary station facilities such as [21];

- Passenger pick-up and drop-off facilities (Kiss and Ride);
- Taxis;
- Parking for people with disabilities;
- Carpool stalls;
- Pedestrian and cycle access routes;
- Cycle parking; and
- Feeder transit facilities.

2.25 Where provided these facilities should take priority over Park and Ride parking and be located closer to the station entrance. Figure 2.3 shows the station access hierarchy in place for new and redesigned stations on San Francisco's BART. The hierarchy gives priority to pedestrians and cyclists whose facilities (such as walk/cycle access routes and cycle parking) should take priority over facilities for transit, pick-up and drop-off and finally car parking. In addition, facilities should be provided for paratransit while suitable parking should be provided for disabled customers with a pedestrian route to the station which is accessible for disabled passengers.

Figure 2.3: Station Access Hierarchy (BART, San Francisco)



Source: [109]

On-Street Parking

2.26 Typically Park and Ride refers to formal parking lots provided specifically for the purposes of Park and Ride. However, Park and Ride can also take place informally utilizing on-street or other unrestricted parking stalls located near to a station. The popularity and use of informal Park and Ride is difficult to monitor and control. It can also lead to conflict with local residents and businesses who may find parking near their property difficult whilst additional congestion on local streets can also be unpopular.

2.27 On-street parking may also occur where the size of a Park and Ride lot is insufficient, or charges are perceived as being too high, resulting in overflow parking on local streets. For example, at a Park and Ride lot in Surrey, BC in the Metropolitan Vancouver area, the introduction of a $2

parking charge led to a significant number of complaints from local residents due to an increase in the number of Park and Ride users parking on-street [51].

2.28 The occurrence of informal on-street parking near to stations can be mitigated through the use of permit parking zones to discourage commuter parking. However, consideration would need to be given regarding the costs of implementing and enforcing a permit parking zone whilst also considering the potential opposition from the local community.

2.29 On-street parking could be formalised in areas near to stations where it does not conflict with existing residential land uses or increase congestion. Where on-street parking is formalised walk distances to the station are likely to be increased over a dedicated Park and Ride site whilst facilities for disabled and elderly customers will also require consideration.

Pricing

2.30 Table 2.3 provides a summary of Park and Ride charges across a range of cities. It shows that while many cities offer some form of free parking for Park and Ride customers, charges in the region of $2 to $4 per day ($40 to $100 per month) are also common. Some cities offer reserved parking, premium locations nearer the station and electric hookups with charged parking.

Table 2.3: Park and Ride Charges by City

City	Location	Charge
Calgary	LRT Lots	Unreserved (50% of stalls) - Free Reserved (50% of stalls) - $85 per month
	Bus Terminals	Free
Edmonton	LRT Lots	Mostly free with option to reserve a space for $50 per month Private lot at Northlands Coliseum - $40 per month
	Bus Lots	Free
Manchester, UK	LRT Lots	Free (Note: In the UK sales tax is chargeable on parking but not transit. Therefore, parking charges are normally included in the cost of transit).
	Bus Lots	Free (Note: In the UK sales tax is chargeable on parking but not transit. Therefore, parking charges are normally included in the cost of transit).
	Commuter Rail Lots	Not promoted as Park and Ride. Limited station parking available from free to £15 ($24) per day (up to $520 per month) depending on location.
Ottawa	LRT Lots	Most lots are free with option of reserved stall for $57 per month Busy lots - $25 per month Very busy lots - $57 per month
	"Rural" Bus Lots on edge of city	Free
San Francisco	BART Commuter Rail	US$1.50 – US$7 per day US$84 – US$220 per month Parking lot usage is evaluated every 6 months. If the lot at a station is full, then the daily parking fee may increase by 50¢ up to a $3 maximum. If the lot is less than 95% full, then the fee may decrease by 50¢.
Seattle	LRT Lots	Free US$5 per month for reserved car pool space
Toronto	Subway Lots	$3 to $7 per day ($35 to $152 per month) depending on location
	Commuter Rail Lots	Free $98 per month for reserved stall
Vancouver	TransLink Lots	$2 - $3 per day
	Municipality Lots	Mostly free. Exceptions are: $2.50 per day ($54 per month) at Bridgeport $3.75 per day ($81 per month) at Lincoln Lot, Coquitlam
Winnipeg	Bus Lots	Free
	Taylor (Bus, includes electrical plugin)	$3 per day $46 per month

Source: [130, 131, 138, 139, 140, 141, 142, 143, 144]

Calgary Pricing Case Study

2.31 Historically Park and Ride parking was provided free of charge in Calgary. Prior to the city's current parking charge structure the City experimented with a daily $3 charge for all Park and Ride lots in 2009.

2.32 Initially, following the introduction of the charge, Park and Ride use declined from 100% capacity at many lots to approximately 55% capacity (compared to a decline in transit ridership of 1%). Over the next 18 months' lot occupancy rebounded to 66% capacity providing $5 million in annual revenues (against $4.4 million operating costs). Evidence suggested LRT ridership remained similar and that customers were using alternative means such as feeder bus routes, walking and cycling to access LRT. A survey of transit users at the time showed that 23% of former Park and Ride users changed to parking in the areas surrounding the LRT Park and Ride lots. However, this was partially counteracted by 12% of users transferred from parking outside the lot to inside the lot as they could now find a stall. Customer satisfaction was mixed with some customers reporting finding it easier to find a stall whilst others objected to paying for a service which was previously free [38, 39].

2.33 By the end of 2010 lots were again filling up and customers were requesting the ability to reserve a stall. In 2011, city council switched to its current system whereby 50% of stalls can be reserved for a monthly charge of $85, with the remaining 50% becoming free on a first-come-first-served basis. The city reports that in 2015, 65% of possible reserved stalls have been leased raising $4 million in revenue. In some lots there are now waiting lists for reserved stalls suggesting differential pricing could be introduced to control demand [39].

Number of Stalls

2.34 Small lot sizes should be avoided as they will not provide enough stalls to justify transit services whilst they are more likely to suffer from overspill parking. Excessively large facilities should be avoided and they may result in long walk distances, be underutilized or create local traffic congestion during peak hours. The suggested size of a Park and Ride facility serving LRT is 500 to 2,500 stalls [21].

2.35 Table 2.4 presents a summary of Park and Ride provision at a number of Canadian cities. It shows a wide range of Park and Ride provision in relation to transit riders with Winnipeg providing a relatively low number of stalls (although the city does not have an LRT system instead relying on Bus Rapid Transit) and Calgary providing a relatively high number of stalls.

Table 2.4: Total Park and Ride Provision by City

City	Transit Systems	Metropolitan Population (Census 2016)	Annual Transit Riders (Millions)	Transit Lots	Private Lots	City Wide Parking Stalls	Population per Park and Ride Stall
Toronto	Subway / Commuter Rail / LRT / Bus	5.9 million	607.8 m	67	0	73,202	81
Vancouver	SkyTrain / Bus / Commuter Rail / Ferry	2.5 million	231.2 m	18	3	8,042	311
Calgary	LRT / Bus	1.4 million	110 m	20	5	17,494	80
Ottawa	LRT / Bus Rapid Transit (BRT) / Bus	1.3 million (Ottawa-Gatineau)	97.1 m	16	7	8,253	158
Edmonton	LRT / Bus	1.3 million	89.3 m	8	1	6,369	204
Winnipeg	Bus	0.8 million	49.9 m	4	8	529	1,512

Source: [39, 45, 145]

2.36 Table 2.5 compares the number of park and ride stalls to ridership for a number of individual transit systems. The number of parking stalls provided per transit rider is highest for commuter rail systems and lowest for metro systems. This reflects the differing primary purpose of these systems with Metro systems providing transit in the heart of large, densely populated cities and commuter rail systems connecting cities to outer suburbs and commuter towns where land for parking is more affordable. Parking at LRT stations falls in between the levels provided at metro and commuter rail stations.

Table 2.5: Park and Ride Stalls and Passenger Boardings by Transit System

City	Transit System	Weekday Boarders	Park and Ride Stalls	Stalls per Boarder
Toronto	Metro (TTC)	1,368,330	10,991	0.01
	Commuter Rail (Go Transit)	227,000	61,978	0.28
Vancouver	Metro (SkyTrain)	385,600	2,983	0.01
	Commuter Rail (West Coast Express)	10,400	2,576	0.25
Calgary	LRT (CTrain)	300,200	15,065	0.05
Edmonton	LRT	108,690	4,651	0.04
Ottawa	LRT (O-Train)	10,300	678	0.07

Source: [39, 40, 45, 60, 61, 62, 130, 139, 145]

2.37 Park and Ride facilities are often highly utilised with many seeing occupancies over 80% or vehicles overflowing onto nearby streets. Parking lot utilization tends to be higher for lots further from downtown and at the end of the line, where transfers onto the transit system are more likely to occur. Overall utilization of Park and Ride lot stalls tends to be high as popular lots are more

likely to be expanded, whilst new lots are likely to be smaller initially to help gauge demand before committing to the expense of constructing a larger lot.

2.38 Table 2.6 provides a summary of Park and Ride utilization for a number of transit systems in North America. The capacity figures reported are averages and individual facilities will see higher or lower utilization.

Table 2.6: Examples of Utilization of Rail Park and Ride Facilities (Some Systems Have Expanded Park and Ride Facilities Since Data was Collected)

System (Year)	Number of Facilities	Number of Stalls	Parked Vehicles	% Capacity
Commuter Rail				
Go Transit – Toronto (2012)	53	62,978	53,081	85%
Sound Transit – Puget Sound, Washington (2010)	10	5,982	5,264	88%
TriMet – Portland, Oregon (2010)	4	699	280	40%
Light Rail				
Denver (2009)	20	11,739	8,517	73%
Calgary C-Train (2010)	17	11,668	7,584	65%
TriMet – Portland, Oregon (2010)	23	9,606	5,261	55%
Santa Clara Valley Transp. Authority (2009)	21	6,471	1,700	26%
Edmonton LRT	5	4,651	3,997	95%

Source: [21 (Examples prior to 2000 have been removed), 38, 40, 65]

Remote Parking Lots

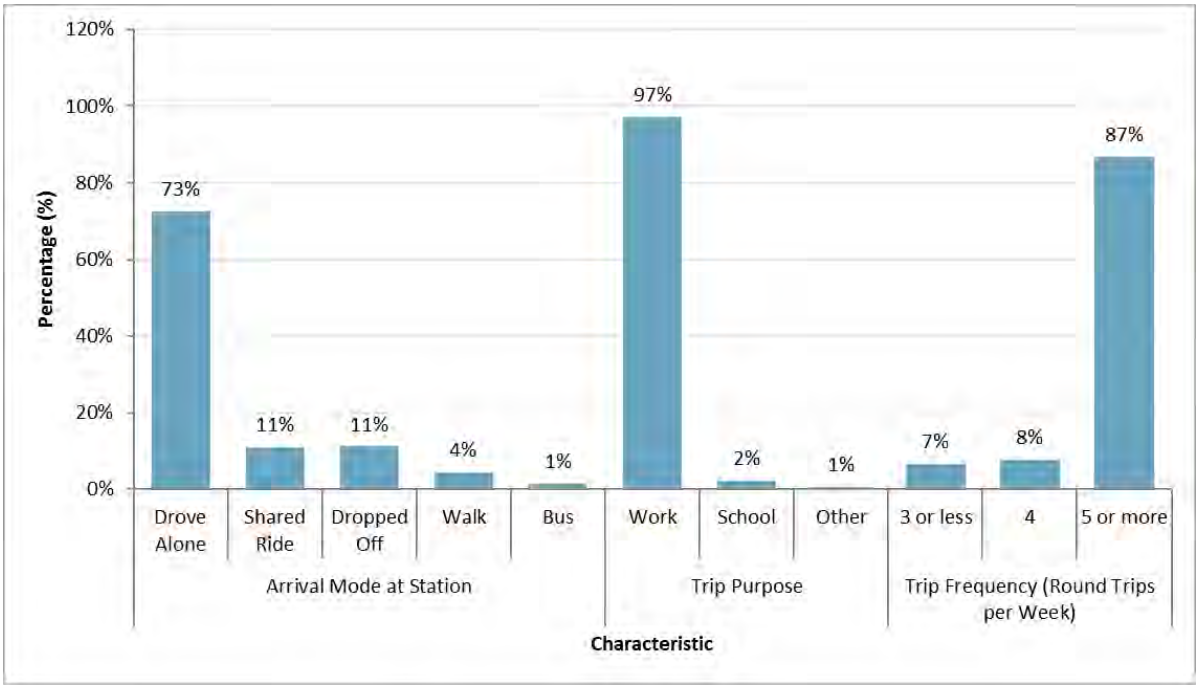
2.39 Between 1984 and 1986 Calgary explored the concept of providing remote parking lots served by either regular or express bus routes to provide a connection to LRT stations. This was intended to allow Park and Ride to be provided on less expensive land. However, it was concluded that these lots would not be successful since they would not decrease travel time, would introduce an additional transfer and there would be concerns if the bus service connecting with the parking lot was not frequent enough.

2.40 Calgary trialled remote parking lots prior to the extension of the South (Somerset-Bridlewood) and Northwest LRT (Crowfoot) lines but found usage levels to be very low. The City of Ottawa reportedly had similar experiences with Park and Ride lots in rural areas that have buses connecting the lots to their Bus Rapid Transit (BRT) stations [39].

User Characteristics

2.41 Figure 2.4 provides a summary of Park and Ride user characteristics in American cities, as reported by Transit Cooperative Research Program Report 153 [21]. It shows that the vast majority of Park and Ride users drove alone (74%). The overwhelming majority also commuted for work purposes (97%) while 87% undertook five or more trips per week.

Figure 2.4: Travel Characteristics of Park and Ride Users



Source: [21]

Transit Oriented Development

2.42 Transit Oriented Development (TOD) typically refers to higher density developments focussed on encouraging the use of transit and active modes over private car use. TOD is regarded as a method to boost transit ridership, increase sustainable travel modes such as walking and cycling, reduce urban sprawl, accommodate growth and create more interesting places. [20].

2.43 Key advantages of TOD include [21]:

- It can make the station environment more cohesive with the surrounding area;
- It generates fewer motor vehicle trips per unit of development compared to similar uses located elsewhere reducing pollution, congestion and requirement to invest in additional highway infrastructure; and
- It can reduce a development's parking demand compared with similar uses elsewhere.

2.44 Due to the requirement for TOD to be located close to good quality transit links this can create conflict with Park and Ride, with both land uses potentially competing for the same sites.

2.45 However, it should be acknowledged, that not all stations are suitable for TOD for a variety of factors such as: restrictive zoning regulations, lack of demand for development or undesirable site locations. The provision of Park and Ride may therefore be the best use for land adjacent to a station in some locations. In some cases Park and Ride may represent the best temporary use of a site preserved as a land bank for future TOD although this creates challenges as discussed below.

2.46 In Calgary the city's Municipal Development Plan (MDP), 2009 [103] identifies areas surrounding 11 LRT stations as Major Activity Centres (MACs) or Community Activity Centres (CACs) for TOD.

Many of these LRT stations currently have large surface level Park and Ride lots which are incompatible with the goals of Calgary's MDP goals of encouraging high-density, mixed-use developments at these stations. The opportunity costs of retaining Park and Ride as these prime development sites includes the lost revenues from the sale of high value land, property and business taxes, additional ridership from TOD and the provision of new, transit focused affordable housing [39].

2.47 However, the replacement of Park and Ride lots with TOD is likely to prove controversial as Park and Ride users commuting habits have already been formed. The re-provision of parking, often in more expensive parkades, can help mitigate against the loss of surface lots, but increases in parking charges to cover increased costs are likely to be unpopular. TCRP Report 95 [21] surveyed transit agencies who reported that 1/3 had Park and Ride stall replacement policies. Of these, about 70% of agencies reported requiring one-for-one (or more) replacement of station parking lost to TOD development. However, San Francisco's BART and Washington Metropolitan Area Transit Authority now allow reductions in Park and Ride parking following the introduction of TOD.

Figure 2.5: Transit Oriented Development in Vancouver

Source: SDG

2.48 Some transit agencies have addressed parking concerns by subsidizing the increased cost of providing parkades. California's Proposition 1C has made this possible for San Francisco's BART and LA Metro. NJ Transit and other agencies have also funded the construction of parking structures to make TOD feasible for developers [21].

Performance Indicators

2.49 A range of performance measures can be used to gauge the success of Park and Ride. However, in order to determine the appropriate measures, the objectives of Park and Ride must first be identified. (See Page 3). Key performance indicators could include:

- increased levels of Park and Ride car park occupancy;
- reduced travel time and/or vehicle km for commuters;
- reduced commuting costs;
- increased transit ridership;
- increase in number of properties who can access transit;
- increased Park and Ride mode share;
- specified average cost per stall of providing parking, or potentially aim to break-even or make a profit from parking charges;
- reduced demand for parking in CBD compared to number of jobs;
- reduction in overflow parking;
- reduction in on-street parking near transit stations
- positive feedback from local residents living near transit stations; and
- positive feedback from Park and Ride users.

2.50 Performance indicators for the success of Park and Ride should also be seen within the context of the success of the wider transport system. Therefore, additional key performance indicators could include:

- Reduction in total vehicle km travelled;
- Increase in transit mode share;
- Increased average vehicle occupancy;
- Reduction in car ownership;
- Reduction in traffic delays in the CBD;
- Reduction in air and noise pollution;
- Provide taxpayer value for money by maximizing development potential from valuable city owned land through additional rental and sales income from TOD as opposed to Park and Ride;
- Increased property tax income from TOD developments compared to Park and Ride lots; and
- Increased ridership on feeder transit services.

Future of Park and Ride

Car Sharing

2.51 Car Sharing is a type of car rental whereby members can use a mobile phone app to book a car as and when they need it. Customers are then able to pay for the use of the car by the hour or day. This reduces the need for individuals to own a private car encouraging more sustainable travel such as the use of transit. Some car sharing services now offer one-way car sharing whereby cars do not have to be returned to their pick-up location but can instead be used for one-way commuter trips with vehicles typically booked using a mobile phone app. In the case of a dual more car share / LRT trip this requires the provision of parking near the station creating a form of Park and Ride.

Ride Share Services

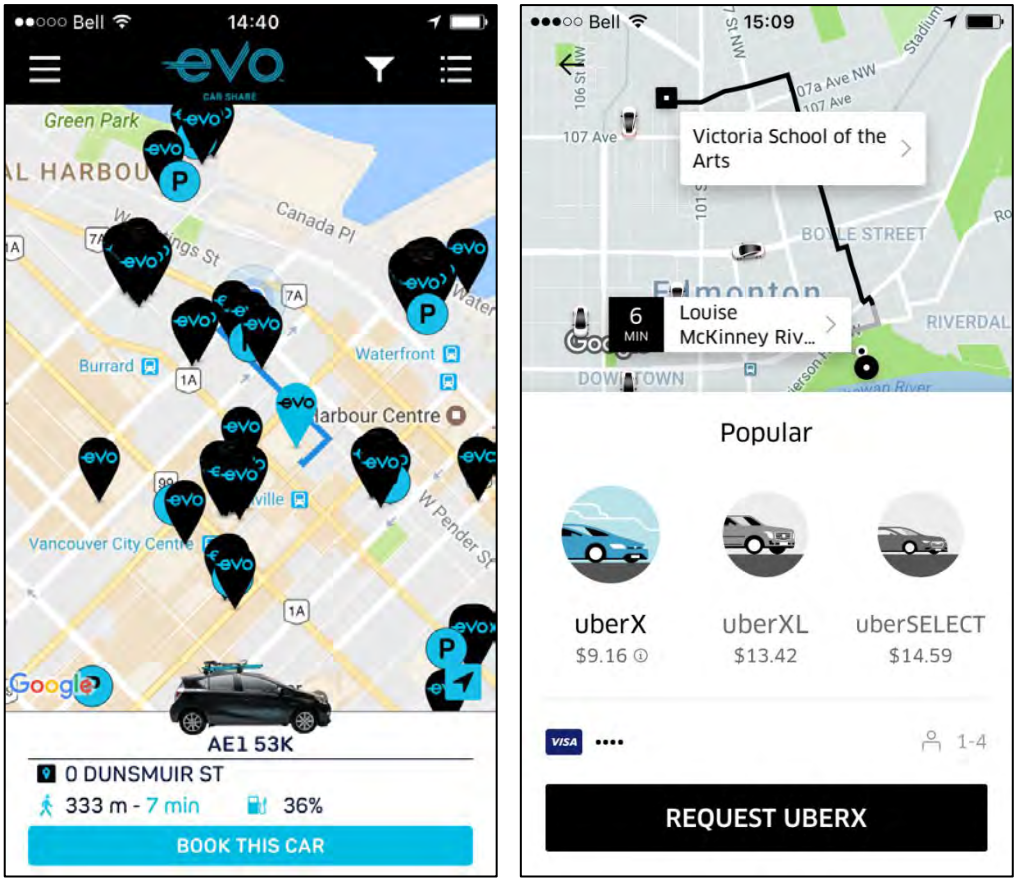
2.52 Ride share services work by connecting passengers with drivers through the use of a mobile phone app. Recent years have seen the rapid growth of ride share services such as Uber and Lyft which have now become integral parts of the transport network in major cities. Ride share services have been a significant disruptor to the taxi trade attracting customers away from established taxi providers.

2.53 As ride share services have grown in popularity they are starting to have an impact on both transit and private car users. Given the recent history of ride share it is too early to tell conclusively what their impact will be on the wider transport network. The following represent possible outcomes for transit should the popularity of ride share continue to increase:

1. The increased availability, affordability and ease of use of ride sharing could reduce the need for car ownership leading to increased transit ridership.
2. Existing transit riders may be attracted away from traditional transit services leading to reduced ridership. This could create a cycle of reduced transit revenues leading to reduced service and further reducing ridership.
3. The replacement of existing bus feeder services to higher order transit networks (such as LRT) with ride sharing. This option would be attractive to transit customers as LRT could still provide cost and time savings for commuter trips during peak hour congestion.

2.54 In all three of the scenarios above there is likely to be a reduced demand for Park and Ride at LRT stations. However, for options one and three there is likely to be increased demand for pick-up/drop-off space at stations as passengers transfer between ride share and LRT. These two options provide opportunities for the redevelopment of exiting Park and Ride sites and for collaboration between cities, transit agencies and ride share providers.

Figure 2.6: Example Screenshots from Car and Ride Sharing Apps



Source: Evo and Uber Apps

Autonomous Vehicles

2.55 Commercial organisations, such as Google, BMW and Volvo, and ride share operators such as Uber, are now developing 'autonomous' self-driving vehicles. Government agencies, innovation centres and other institutions have also taken interest and are now promoting the development of autonomous vehicles which have the potential to revolutionise the transport sector in a number of ways. This could be by enhancing the provision of transport in suburban areas traditionally poorly served by transit; boosting accessibility for particular demographic groups such as the elderly or disabled; or optimising transport network capacity and management.

2.56 However, despite progress in the development of autonomous control systems to support self-driving vehicles, a number of key questions remain to be answered before the vision of self-driving vehicles can be even partially realised. These include:

- technical considerations of sensors and system security;
- policy issues such as the integration of self-driving vehicles with wider transport plans;
- regulatory issues covering the testing and future use of self-driving vehicles on public roads;
- liability issues in the case of accidents;
- privacy concerns regarding the sharing of data about the vehicle;

- a clearer understanding of the impact on the environment — for instance, could the emergence of self-driving cars have a negative impact on the environment by increasing the number of vehicles on the road, and reducing the role of public transport and active travel;
- societal expectations and acceptance of self-driving vehicles; and
- the wider economic impacts.

2.57 The future impact of autonomous vehicles on Park and Ride is currently unknown and is dependant on how the technology develops and is consumed. For instance, if autonomous vehicles become the next iteration of ride sharing they are likely to reduce the demand for Park and Ride. Alternatively, if autonomous vehicles are purchased by individuals and utilised in much the same was as private cars are today then this could result in increased demand for Park and Ride. Alternatively, autonomous vehicles could return home once they have dropped off their passenger freeing up Park and Ride space but created additional vehicle mileage and congestion on the highway network.

2.58 If a significant number of autonomous vehicles are used during the peak hour that sit idol during the off-peak then these vehicles will need to be parked and potentially charged. Existing Park and Ride sites could potential be used to serve this purpose. This could create benefits for the City of Edmonton who may be able to charge autonomous vehicle operators for electricity whilst space requirements could be reduced allowing for redevelopment of the site for TOD.

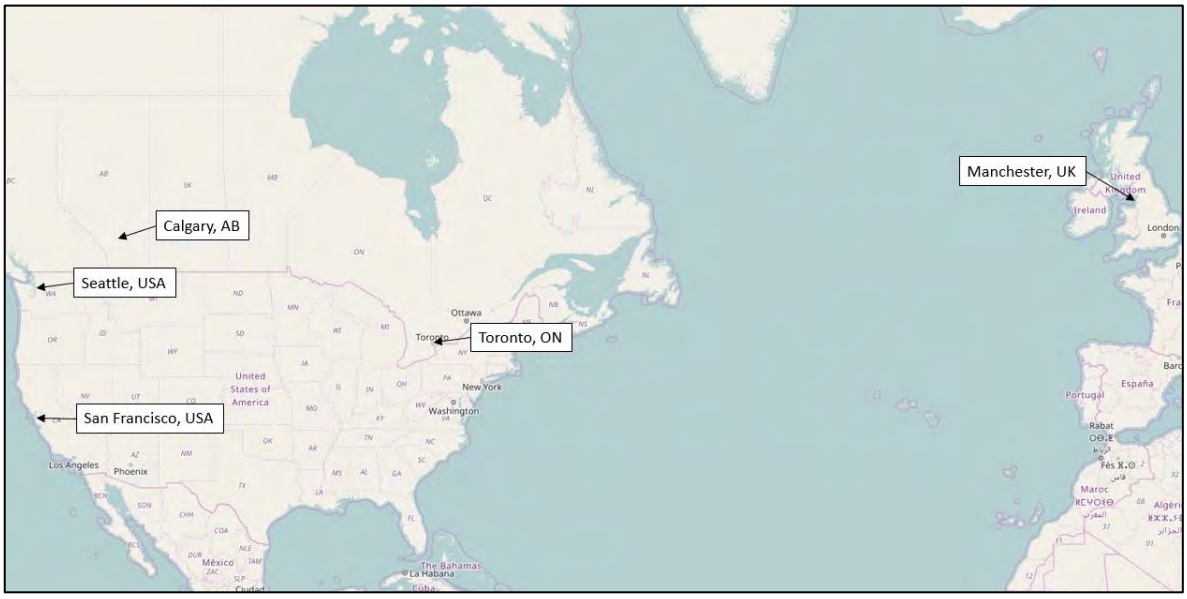
2.59 To ensure that transport policies regarding transit and Park and Ride remain relevant in the future cities must monitor and react to developing technology such as ride sharing and autonomous vehicles.

3 Policy Case Studies

Introduction

3.1 The following case studies provide an introduction to different policy approaches to Park and Ride both in Canada and internationally. Figure 3.1 shows the case study locations.

Figure 3.1: Location of Case Studies



Source: © OpenStreetMap contributors

Calgary, AB

Introduction

3.2 Calgary is a city in located in Alberta, Canada. The city has a metropolitan population of 1.4 million (2016 Census Metropolitan Area) and since 1981 has been served by the CTrain LRT system which is operated by Calgary Transit and part of the City of Calgary.

3.3 The CTrain system has a length of 60km and an average weekday ridership of 300,200. The CTrain runs along two separate lines and runs mainly in its own right of way. In the downtown section the CTrain runs along public streets shared with other traffic. Figure 3.2 provides an example of CTrain infrastructure on the downtown section of the route.

Figure 3.2: Calgary CTrain

Source: SDG

Park and Ride Summary

3.4 The city is served by a total of 17,500 Park and Ride stalls at 33 locations. Parking at CTrain stations accounts for approximately 15,000 of these stalls with the remainder being served by buses. About 1,600 Park and Ride stalls are provided privately at five locations. In total, Park and Ride users account for about 15% of weekday transit customers at suburban stations.

3.5 At city owned Park and Ride lots 50% of stalls are reserved with a charge of $85 per month. This ensures that Park and Ride customers who lease a stall are provided with a reliable parking option. Stalls are not reserved individually but rather an area is set aside for paying customers. As not all lease holders use the Park and Ride everyday the city sells approximately 10% to 20% more leases than there are stalls where there is sufficient demand. At popular lots there is a waiting list for a reserved stall.

3.6 The remaining 50% of stalls are available free of charge on a first-come-first-served basis. At popular lots these stalls fill up early, often by 07:00am. From 10:00am the reserved parking lot becomes a free parking lot freeing up any available stalls for shoppers and shift workers [39].

Policy

3.7 In 1986, following a series of reports, Council approved policy guidelines that called for Park and Ride to be provided to serve 15-20% of customers accessing LRT service. These policy guidelines included reference to [37]:

- Providing a balance of LRT access modes with consideration given to serving the largest possible market with emphasis on attracting trips on local feeder buses.
- Attracting those who may not otherwise use transit.
- Not placing a financial burden on the transit system.
- Providing Park and Ride outside of a 5km radius of downtown.
- The need to determine the size of each lot based on the size of the station service area, capacity of adjacent roadways and the nature of the adjacent communities.

3.8 Calgary's City Council's Park and Ride policy (Direction Item 7.4.2) [37] has recently been updated to:

- Maintain current levels of parking relative to weekday CTrain ridership (15%).
- Allow businesses near stations to make their parking available to transit customers by requesting changes to the bylaw.
- Look at ways of making existing Park and Ride work for more people by considering different reserve prices in different lots, the amount of the lot allocated to reserve parking, a daily reserve parking fee, a way of putting spots on hold without losing the reservation and the hours of reserve parking.
- Prepare for future transit oriented development by examining each station (or groups of stations) starting with Anderson Station.
- Look at how higher prices may be charged for Park and Ride to people who do not live in Calgary.

Toronto, ON (GO Transit)

Introduction

3.9 Toronto is located in Ontario, Canada. The city is the largest in Canada with a metropolitan population of 5.9 million (2016 Census Metropolitan Area, includes Mississauga, excludes Hamilton). Transit in Toronto is provided by a wide range of systems including: Subway, Streetcars and Buses operated by TTC, and Commuter Rail operated by Go Transit.

3.10 Formed in 1967, GO Transit is now part of Metrolinx, an organisation created by the Government of Ontario. GO Transit operates heavy rail commuter services on seven fully segregated routes serving 65 stations with 450 route km and has an average weekday ridership of nearly 227,000 [45]. The network serves the wider Greater Golden Horseshoe region. Figure 3.3 shows the Go Transit network map.

Figure 3.3: Go Transit Network Map

Source: [131]

Park and Ride Summary

3.11 Go Transit provides approximately 62,000 parking stalls at its stations making it one of the largest parking operators in North America. GO Transit has added approximately 2,500 stalls per year to keep up with increases in demand and has further plans for parking expansion.

3.12 GO Transit provides high levels of car parking relative to ridership with 0.28 parking stalls provided for each boarder. This translates to seven parking spots for every ten commuters once two boardings per commuter per day and average car occupancy have been taken into consideration [40]. The vast majority of parking stalls are free and operate on a first-come-first-served basis, although at some lots commuters can reserve a stall for a $98 per month fee. There is a waiting list to reserve a stall at some popular lots [131].

3.13 Compared to the other Park and Ride case studies GO Transit is more reliant on Park and Ride for ridership. This occurs as a result of GO Transits larger network which services lower density commuter towns and neighbourhoods. GO Transit's policy of providing a large number of Park and Ride stalls, with further expansion planned, represents an alternative approach to Park and Ride provision. However, as a result of growing ridership and a planned expansion of services from peak hour commuter services only to an all-day service, GO Transit's reliance on Park and Ride is becoming less sustainable.

Figure 3.4: Park and Ride Lot at Kennedy Station, Toronto

Source: SDG

Policy

3.14 Metrolinx has developed the GO Transit Rail Parking and Station Access Plan which has the following vision [40]:

"GO Transit rail parking and station access will be planned and delivered in an integrated, sustainable, and financially efficient manner to grow ridership, enhance all customers' experience and safety, and reduce the dependency on single-occupant vehicles.

Parking will be planned, delivered, and managed in collaboration with key local and provincial partners to support transportation and land use objectives for increasing the economic competitiveness of the GTHA, improving the quality of life of local communities, and contributing to the region's environmental sustainability."

3.15 To support the vision, the following guiding principles were developed [40]:

- **A Multi-Dimensional Approach**: a system, corridor, and station level approach is required for the planning and delivery of parking and station access investment. This was applied through the use of system wide and corridor ridership forecasts with potential improvements and Park and Ride expansions identified individually at each station.

- **Strategic Parking Expansion**: targeted parking expansion will continue to support ridership growth.
- **Supporting Other Modes**: investment will create a balance between the movement of pedestrians, cyclists, local transit and other vehicles to ensure safe and efficient movement to and through the station for all GO Transit customers, developing a modal hierarchy that prioritizes more sustainable travel behaviour.
- **Financial Efficiency**: investment will be subject to triple bottom-line multiple-account evaluation, including consideration of value for money using life cycle costing analysis that includes capital and operating costs, as well as amortization.
- **Working in Partnership**: on-going engagement and partnerships are required with for the successful planning and delivery of the policy and associated plans.
- **Sustainable Growth**: projects resulting from the policy will be delivered incrementally in order to achieve the vision, and support sustainable ridership growth, for the short term (1 to 5 years), medium term (6 to 10 years) and long term (11 to 20 years).

Greater Manchester, UK

Introduction

3.16 Manchester is a city situated in the northwest of England. The City of Manchester is located at the centre of Greater Manchester, a metropolitan area encompassing neighbouring suburbs, towns and cities with a total population of 2.7 million (ONS, 2011). Manchester is served by an extensive network of heavy rail passenger services and buses. Since 1992 Manchester has also been served by Metrolink, the city's light rail network. The Metrolink network is owned by Transport for Greater Manchester (TfGM) and operated by a private company as a concession. TfGM are the transport authority for the Greater Manchester local government authority.

3.17 The Metrolink network has 92km of track and has an annual ridership of 33 million passengers [104]. Assuming that weekend daily ridership is approximately 50% less per day than weekday ridership this would be equivalent to approximately 105,000 passenger boardings per weekday. The Metrolink network consists of six separate lines. In the suburbs the system is generally segregated from traffic whilst trams mix with other traffic on city centre streets. Figure 3.5 shows a Metrolink vehicle in service.

Figure 3.5: Manchester Metrolink

Source: SDG

Park and Ride Summary

3.18 Metrolink provides approximately 3,300 parking stalls at its stations at 25 locations with most Park and Ride sites used for onward travel into Manchester city center. Parking is free for Metrolink users. However, it should be noted that in the UK sales tax (VAT) is chargeable on parking but not transit. Therefore, at Park and Ride sites parking is typically provided free of charge with the cost of providing parking subsidised by transit fares.

Policy

3.19 The overarching policy of TfGM is to develop new Park and Ride sites beyond the boundary of the orbital M60 highway. This highway is located approximately 8km from the CBD and provides high capacity highway links to the rest of the region allowing traffic to be intercepted before it enters congested central streets.

3.20 Greater Manchester's Third Local Transport Plan sets out the following criteria for transit services when considering where to locate a successful Park and Ride lot. Transit services should [105]:

- provide a fast and frequent service;
- not be solely dependent on Park and Ride for its revenue (since this would be mainly during morning and evening peaks);
- have spare capacity; and

- have a price that passengers see as favourable compared to the cost of driving to the final destination and parking.

3.21 In the longer term TfGM's Third Local Transport Plan states that the following may provide opportunities for further Park and Ride development [105]:

- additional passenger capacity on the rail network (e.g. through longer trains) or operating more frequent services can create potential demand for Park and Ride at stations which would not have previously been suitable due to peak period overcrowding or having low frequency services;
- new proposals for rapid transit corridors (whether tram or bus-based) can create opportunities for providing additional Park and Ride capacity;
- improvements to the strategic highway network can provide opportunities for Park and Ride where access to rail stations or Metrolink stops is improved;
- new development can result in large increases in demand on key arterial corridors and generate potential for Park and Ride. TfGM will work with planning authorities and developers to capitalise on any opportunities to provide Park and Ride as part of a larger development, and to secure developer contributions to fund (partly or wholly) transport infrastructure wherever possible; and
- sites with future potential for Park and Ride, but not deliverable in the short term. TfGM will pursue development of these with partners.

San Francisco, USA

Introduction

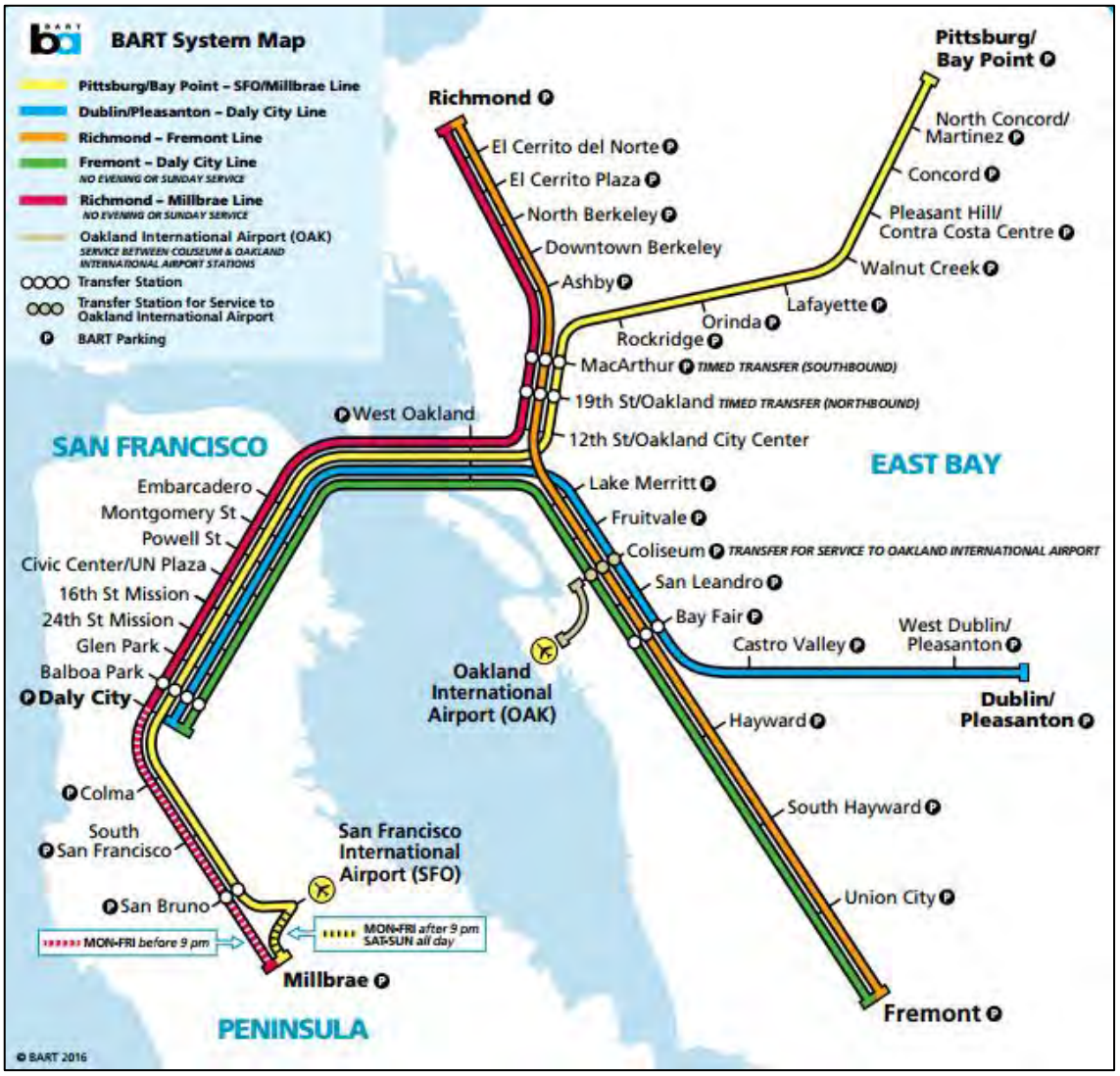
3.22 San Francisco is located in the San Francisco Bay Area of California, USA. The wider San Francisco metropolitan area (San Francisco-Oakland-Hayward) has a population of 4.3 million [63]. Transit in the Bay Area is provided by a wide range of services including:

- Metro services:
  - BART (Bay Area Rapid Transit)
- Commuter rail services:
  - ACE (Altamont Corridor Express)
  - Caltrain
  - Capitol Corridor (Amtrak)
- Light rail services:
  - Muni Metro
- Heritage street cars which serve tourists and commuters
  - San Francisco Cable Car System
  - Market Street Railway
- Bus services

3.23 Opened in 1972 BART provides a metro service along 104 miles (167km) of route and has an average weekday ridership of 435,000 [64]. BART is owned and operated by the Bay Area Rapid Transit District, a consortium of city and municipal authorities in the Bay Area. BART runs along five separate routes with four of these converging to provide a high frequency service through

downtown San Francisco and the Transbay Tube tunnel underneath San Francisco Bay [144]. Trains run fully segregated in their own right of way using a combination of underground and aboveground lines. Figure 3.6 shows the BART network.

Figure 3.6: BART Network Map



Source: [144]

Park and Ride Summary

3.24 BART provides over 46,000 parking stalls at 32 stations with 39% of BART riders using park-and-ride. Historically parking at BART stations was free. However, to help better manage parking in 2002 BART introduced paid monthly parking in some of its lots which provided users with a guaranteed stall. Over time, paid parking has expanded and as of 2014 fees are in place at all parking lots [21].

3.25 Reserved parking is available in allocated lots at most stations. Reserved parking is available on a monthly or daily basis using an online booking system. The remainder of stalls are available on

first-come-first-served basis for which a fee is charged on the day. The parking fee can only be paid from within the station gate line ensuring that the Park and Ride lot can only be used by transit customers [144].

3.26 Reserved monthly parking costs US$84 to US$220 per month depending on the lot. However, there is a waiting list for monthly parking at almost all stations. Daily reserved parking is available for a charge of US$5.50 to US$11.50 per day and up to 10 days can be reserved at a time. Unreserved parking is available for a US$1.50 to US$7 daily fee although many popular lots are full by 07:00 am. To help manage the demand for parking lot usage it is evaluated every six months. If the lot at a station is full, then the daily parking fee may increase by 50¢ up to a maximum limit (US$3 at most stations). If the lot is less than 95% full, then the fee may decrease by 50¢ [144].

Policy

3.27 BART now actively encourages TOD which it is promoting around its stations. Over half of stations currently have TOD at some stage of planning or construction and the organisation has developed guidelines for TOD at stations. Securing replacement Park and Ride parking when lots are developed for TOD has been a challenge. Historically BART policy has required the one-to-one replacement of parking elsewhere on the site, through the use of parkades. However, the high cost of parkades has stalled several developments and as a result a net reduction in replacement parking of 25% is now allowed to secure TOD [21].

3.28 To help guide the development of land around stations BART has developed a specific TOD policy with the following goals [106]:

- **Complete Communities:** Partner to ensure BART contributes to neighborhood/district vitality, creating places offering a mix of uses and incomes.
- **Sustainable Communities Strategy**: Lead in the delivery of the region's land use and transportation vision to achieve quality of life, economic, and greenhouse gas reduction goals.
- **Ridership**: Increase BART ridership, particularly in locations and times when the system has capacity to grow.
- **Value Creation and Value Capture**: Enhance the stability of BART's financial base by capturing the value of transit, and reinvesting in the program to maximize TOD goals.
- **Transportation Choice**: Leverage land use and urban design to encourage non-auto transportation choices both on and off BART property, through enhanced walkability and bikeability, and seamless transit connectivity.
- **Affordability**: Serve households of all income levels by linking housing affordability with access to opportunity.

BART TOD Policy in Practice

3.29 BART's Pleasant Hill station was opened in 1973 as a next-to-the-end-of-the-line station with 3,245 stalls of surface parking. From 1986 approximately 2,400 housing units, two hotels, offices with over 4,000 employees, and other improvements were built in the area surrounding the station although the surface Park and Ride lots were retained. In 1995, BART advanced an effort to redevelop much of the surface parking into TOD, including pedestrian-friendly connections and mixed-use development with office, residential, and retail tenants. To restore the nearly 1,500 commuter stalls on which the development was constructed, a six-story parking garage for transit

users was incorporated. Parking for the new development is housed within the TOD's buildings, but at reduced ratios due to high levels of transit accessibility at the site [20].

3.30 The area surrounding Pleasant Hill station has continued to develop as a high density TOD neighbourhood. Now known as the Contra Costa Centre Transit Village the area now contains 2,700 residential units with 6,000 employees working in 2.4 million square feet of office and commercial space.

Seattle, USA

Introduction

3.31 Seattle is located in King County, Washington state, on the northwest coast of the USA. The wider Seattle metropolitan area (Seattle-Tacoma-Belleview) has a population of 3.4 million [63]. Transit in the Seattle metropolitan area is provided by King County Metro, who provide streetcar, bus and express bus services for King County; and Sound Transit, the regional transit authority who provide LRT (Link light rail), commuter rail (Sounder) and express bus services in the Greater Seattle area. In addition, a two station downtown monorail is operated on behalf of the City of Seattle.

3.32 Link light rail has a total system length of 35km and consists of two separate lines. The 2.5km Tacoma Link line provides a service between downtown Tacoma and Tacoma Dome station providing links to Sounder commuter rail. The 35km long Central Link line runs north-south from the University of Washington through downtown Seattle to Seattle-Tacoma airport. The Link light rail network has an average weekday ridership of 71,800 [66]. Seattle Link runs mainly in its own right of way, in the downtown section Link shares a dedicated transit tunnel with bus services. Figure 3.7 provides an example of Seattle Link infrastructure on the downtown tunnel section of the route.

Figure 3.7: Seattle Link Light Rail Sharing Downtown Tunnel with Bus Services

Source: SDG

Park and Ride Summary

3.33 A total of 39,000 Park and Ride spaces are provided by a range of transit authorities and municipalities in the Greater Seattle region. Park and Ride transit services are provided for express bus, LRT and commuter rail services. Three Park and Ride sites with 4,000 spaces serve Link light rail. This is a relatively small proportion of the total with planning policies discouraging the provision of Park and Ride for this relatively new transit system. Park and Ride spaces are typically free although paid stalls on private lots are available near stations in some locations.

Policy

3.34 Planning and policy in the Greater Seattle region is spread across six difference transit agencies and a large geographical area. In addition to traditional bus and LRT services vanpools, express buses and car pools are also promoted as an alternative to single-occupancy vehicles and transit.

3.35 A key goal of Sound Transit's Regional Transit Long-Range Plan (2014) [110] is to strengthen communities' use of the regional transit network. This is to be achieved by:

"Encouraging the development, or redevelopment, of areas around transit stations and centers and park-and-ride lots with a mix of transit-oriented activities at a pedestrian scale and orientation to enhance current and future transit use." [110]

3.36 Strategy 3.2.3 of King County Metro's Strategic Plan for Public Transport (2011-2021) [111] aims to facilitate convenient and safe access to transit by all modes. This is to be achieved by:

"Working with public and private partners to promote access to transit through all modes, including walking, bicycling, taking connecting transit or paratransit services, or driving to a pick-up/drop-off point or park-and-ride. Tactics include facility design and infrastructure investments to enhance safety, security and connectivity." [111]

3.37 While a significant number of Park and Ride spaces are provided in the Greater Seattle area and municipal policy is supportive of the role of Park and Ride and the expansion of Park and Ride facilities, only 4,000 Park and Ride stalls have been provided as part of the Link light rail network. This is compared to 35,000 bus and BRT stalls and a metropolitan population of 3.4 million (equivalent to one Park and Ride stall per 850 people).

3.38 As part of the expansion of Link light rail Sound Transit implemented Restricted Parking Zones within 400m of new transit stations to prevent parking by commuters on local streets. This policy supports the relatively low levels of parking at LRT stations by discouraging commuters from using their cars to access the LRT system. It also helps to ensure that local residents can still park outside their homes [46]. Figure 3.8 shows the extent of the new Restricted Parking Zone implemented in the area surrounding Beacon Hill station.

Figure 3.8: Restricted Parking Zone for New Link Station

Source: [46]

4 Review of Edmonton Facilities and Strategies

Introduction

4.1 The City of Edmonton has a metropolitan population of just over 930,000 (2016 Census) and serves a wider metropolitan population of 1.3 million (2016 Census Metropolitan Area). Since 1978 Edmonton has been served by Edmonton LRT which forms part of Edmonton Transit System (ETS) and is owned and operated by the City of Edmonton.

4.2 Edmonton's LRT has a route length of 24km and a weekday ridership of approximately 109,000. Edmonton LRT consists of two separate lines; The Capital Line and the Metro Line. The Metro line currently shares much of its route with the Capital Line but with a short, 3.3km spur from Churchill station in downtown to NAIT station to the north of downtown [107]. Edmonton LRT generally runs at-grade in its own dedicated right of way. The alignment runs in a tunnel under the University of Alberta and through the downtown core. A number of extensions are currently at various stages of planning and construction. Figure 4.1 shows the Edmonton LRT in operation.

Figure 4.1: Edmonton LRT

Source: SDG

Park and Ride Summary

4.3 Edmonton is served by a total of approximately 6,400 Park and Ride stalls, of which approximately 4,650 serve Edmonton LRT with the remainder serving Edmonton's bus services via transit centres. Park and Ride stalls are provided at eight lots by the City with one 650 stall lot provided privately by Northlands Coliseum. Table 4.1 provides a summary of Park and Ride sites in Edmonton. Full details of each site are contained in Appendix B.

Table 4.1: Edmonton Park and Ride Site Summary

Location	Ownership	Distance from CBD	Charge	Transit Service	Stalls
Clareview	City	8.7km	577 paid stalls (up-to) - $50 per month	LRT and Bus Transit Centre	1,393
Century Park	City	9.5km	912 paid stalls - $50 per month	LRT and Bus Transit Centre	1,323
Belvedere	City	6.6km	129 paid stalls - $50 per month	LRT and Bus Transit Centre	761
Stadium	City	2.6km	163 paid stalls - $50 per month	LRT and Bus Transit Centre	520
Lewis Farms	City	11.7km	Free	Transit Centre (Bus Only)	613
Davies	City	5.5km	Free	Transit Centre (Bus Only)	456
Eaux Claire	City	8.6km	Free	Transit Centre (Bus Only)	391
Meadows Transit Centre	City	10.9km	Free	Transit Centre (Bus Only)	254
Northlands Coliseum	Private	8.6km	$40 per month	LRT	654
Total			**2,435 paid stalls**		**6,365**

Source: [145, 134]

4.4 As shown in Table 4.1 a proportion of Park and Ride at LRT stations is set aside as reserved parking for a monthly fee of $50. Paid Park and Ride users are not reserved an individual stall but instead are guaranteed a stall in a reserved lot. The remaining stalls are provided free of charge on a first-come-first-served basis. After 5pm and on weekends all parking stalls are free to use. A waiting list is in operation for paid reserved monthly parking.

4.5 Edmonton's Park and Ride lots are very popular with 93% of parking stalls adjacent to an LRT station occupied by 11:00am and 77% of parking stalls adjacent to bus Transit Centres occupied by 11:00am (combined 84% occupancy) [65]. 99% of the unreserved stalls at LRT stations were occupied by 11:00am.

Figure 4.2: Parking Lot at Stadium Park and Ride

Source: SDG

Existing Policy

4.6 Edmonton's existing policy towards Park and Ride is outlined in Policy C554A (2016) [108]. This states that the overarching aim of Park and Ride is to:

- improve travel options with the primary objective of increasing transit ridership by providing attractive accessibility to transit;
- target trips associated with land uses that have high trip generation, such as Edmonton's Downtown, University, and other post-secondary areas; and
- accommodate travel necessary to support major special events.

4.7 In terms of the location of Park and Ride sites Policy C554A states that lots should be located:

- At selected LRT stations, transit centres, or other major facilities served by LRT, premium bus, or express bus services in areas along or outside of the Inner Ring Road (Yellowhead Trail, 170 Street, Whitemud Drive, and 75 Street/Wayne Gretzky Drive);
- Where direct access to/from the Park and Ride site is within reasonable distance of an arterial roadway or road of regional significance;
- At key sites where more intensive development is not possible or feasible, such as the Transportation Utility Corridors; and

- At sites integrated with other complementary land uses (including City or private facilities) served by LRT, premium bus, or express bus service to provide uses to serve users through a broader range of the day and allows utilization of spare capacity in different demand periods.

4.8 Policy C554A states that parking fees may be charged based on:

- market rate;
- Park and Ride user demands; and
- provision of ancillary services such as reserved stalls.

4.9 Policy C554A also sets out guidelines on Park and Ride design and states that in some cases Park and Ride facilities may be transitioned into TOD over time.

5 Prioritization of Strategies

5.1 Chapter 2 set out a review of Park and Ride best practice based on guidance, academia and existing facilities. Chapter 3 provided case studies for Park and Ride policy in a number of cities whilst Chapter 4 provided a review of Park and Ride in Edmonton. This Chapter uses the best practice guidance and case studies outlined in this report to develop a strategy for Park and Ride in Edmonton.

Aims and Objectives

5.2 The first step to developing a Park and Ride strategy should be the development of the aims and objectives of Park and Ride.

Aims

5.3 The overarching aim of Park and Ride is typically to provide the benefits of transit to suburban and out-of-town locations where lower densities result in low levels of transit provision and high levels of car use.

Objectives

5.4 The objectives of Park and Ride are more varied and should be carefully considered by the City and key stakeholders during the development of a Park and Ride strategy. Objectives should be focussed around reducing the number of vehicle km travelled within the city and extending the reach of the transit system to lower density areas which are not well served by transit, whilst protecting local residents living near a transit station from traffic and overflow parking.

5.5 The development of the objectives should also consider the potential negative consequences of Park and Ride facilities, allowing these to be mitigated and helping to ensure the success of the Park and Ride strategy. Negative consequences typically include the financial cost of building and maintaining parking facilities, the opportunity cost of using high value land next to stations for parking, the detrimental effect of parking on the local environment and the impact that the provision of parking has on car use and the viability of local transit services.

5.6 Chapter 2 provides a list of typical Park and Ride objectives and the negative consequences of Park and Ride on a city and its transport network. The development of the aims and objectives of the Park and Ride strategy could be achieved through the use of stakeholder workshops, public meetings, and/or passenger and resident surveys.

Transit Oriented Development

5.7 TOD helps to improve the environment surrounding a station, reduce car trips and increase transit ridership. The development of TOD is encouraged by Edmonton's TOD guidelines. However, many sites which are suitable for TOD are also suitable for Park and Ride. The replacement of Park and Ride lots with TOD is increasingly taking place in other cities with Park and Ride often relocated to costlier parkades.

5.8 The provision of walkable communities and good transit links in TOD reduces car use and improves transit ridership. This can reduce the need for development related parking onsite reducing costs and development related traffic. Existing and new TOD sites should be monitored to assess the impact of TOD on transit ridership, parking demand and vehicle trip generation.

5.9 The use of parking charges can help to pay for the construction of parkades for Park and Ride use whilst developer contributions could also be made as a condition of rezoning. A model could be developed by the City to assess the impact that developing Park and Ride or TOD will have on transit ridership, revenue, parking demand, operating costs and vehicle trip generation.

Location

5.10 Due to the costs involved in the planning and development of new Park and Ride facilities (or changes to existing facilities) parking lots should be well utilized to ensure efficient use of land and a good return on investment.

5.11 For Park and Ride sites to be attractive to users they should provide faster, more reliable and cheaper journeys than driving all the way to a traveller's final destination. Therefore, Park and Ride facilities should:

- have good access to fast and reliable transit options;
- be located near to a freeway or major arterial road to provide good vehicle access;
- be located a sufficient distance from the city centre to make switching modes worth while; and
- be affordable to use.

5.12 The provision of transit to access stations is preferable to the provision of Park and Ride facilities. Therefore, Park and Ride sites should not be located in areas with good transit services as this will attract existing riders to Park and Ride reducing the viability of existing transit services. Therefore, to encourage the use of transit Park and Ride lots should be located:

- in areas where population densities are too low to support transit;
- where Park and Ride is less costly to provide than feeder transit services; and
- in areas which are not attractive for TOD.

Design Characteristics

5.13 For Park and Ride to represent a cost-effective solution for the city Park and Ride costs should be kept to a minimum. This is likely to result in the construction of surface level and larger parking lots (500 to 2,500 stalls) with parkades provided where land is valuable. The design of Park and Ride lots should also:

- consider the provision of complimentary station facilities such Kiss and Ride, taxi, accessible parking, carpool stalls and feeder transit facilities which should be located closer to the station than Park and Ride parking;
- have good vehicle accesses;
- be located near to the station to minimize walk time from the parking stall but not at the expense of other users such as pedestrians, cyclists and transit passengers;
- have good levels of lighting and natural surveillance for user safety and security;
- be compatible with surrounding land uses; and
- be flat and well-drained.

Costs and Pricing

5.14 The costs of constructing and maintaining Park and Ride lots are significant, particularly in relation to the number of transit riders it attracts. The large amount of land required by Park and Ride lots make its provision particularly expensive in areas with high land values. While the provision of parkades can make more efficient use of land, they create additional construction and maintenance costs.

5.15 With Park and Rides typically used for commuting Monday to Friday only and annual operating costs ranging from $800 for surface lots to $2,000 for parkades, the operating cost of providing Park and Ride is equivalent to approximately $3 to $8 per weekday ($67 to $167 per monthly) rider. Therefore, costs are unlikely to be covered by fare revenue alone, even before the costs of land and construction are taken into consideration. If Park and Ride stalls were better utilized in the evenings and at weekends then the cost per user could be reduced. This could occur through the use of shared lots with retail or leisure uses which have different peak parking requirements.

5.16 Where parking is provided free or at less than cost other transit users and taxpayers are subsidizing Park and Ride users, who often live outside the city boundaries and do not pay property tax to the City. With many Park and Ride lots already full and other cities increasingly charging for parking the days of free Park and Ride appear to be numbered. Therefore, Park and Ride users should be charged to reduce operating costs and subsidies to car drivers, encourage the use of transit, and control demand meaning that those who do need to use Park and Ride are able to find a parking stall.

5.17 As Park and Ride is mainly utilised by car-owning commuters typically benefits wealthier transit riders. The equity of Park and Ride could be improved through the provision of free or subsidized parking for disadvantaged groups such as the unemployed, those on low incomes and those with accessibility needs. Before additional Park and Ride charges are implemented existing Park and Ride lots should be surveyed to determine occupancy and overflow parking levels. Park and Ride users should be surveyed to determine their travel behaviour, journey origin and destination, opinions on the current arrangement and willingness to pay for parking.

Performance Indicators and Monitoring

5.18 The selection and development of performance indicators for Park and Ride will be dependant on the Park and Ride aims and objectives. Chapter 2 sets our range of potential performance indicators. These should be developed and reviewed with the input of key stakeholders. Park and

Ride sites should be monitored to assess their performance and to inform future policy or price adjustments.

Future of Park and Ride

5.19 Recent transport developments such as the growth of car sharing, ride sharing and autonomous vehicles are likely to have an impact on the future demand for Park and Ride. In many future scenarios this could lead to a reduction of the demand for Park and Ride but may create other challenges regarding highway congestion and the viability of transit services. To ensure that transport policies regarding transit and Park and Ride remain relevant in the future the City of Edmonton must monitor and react to developing technology such as ride sharing and autonomous vehicles.

Next Steps

5.20 To aid the City of Edmonton in the development of a Park and Ride and access strategy the following next steps could be undertaken in support of the strategy development:

- Determine the aims and objectives of Park and Ride provision with stakeholder input;
- Undertake a review of travel behaviour at existing Park and Ride facilities and TOD sites;
- Identify suitable locations for new or expanded Park and Ride sites using the guidance contained within this document;
- Develop a cost and ridership model for Park and Ride and TOD to test various strategies at the identified locations. This model would calculate transit ridership and car trips for different site uses (Park and Ride or TOD) to assess the forecast impact on fare revenues. Income from parking charges, property sales or property tax could also be incorporated to calculate the scenario which provides tax payers with the best value for money; and
- Develop a programme of ongoing monitoring and review for Park and Ride facilities.

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Appendices

A Sources

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City of Edmonton
Park and Ride Strategy - Best Practice Review
Sources

Appendix A

No.	Resource Type	Title	URL (At Time of Reporting)
1	Academic Article	Parking and Access Issues in Transit Orientated Developments, Perth, Australia	https://www.researchgate.net/publication/44858665_Parking_and_access_issues_in_transit_oriented_developments
2	Academic Article	Commuter Parking versus Transit Orientated Development, San Francisco, CA, USA	http://eco-rapid.org/Project/studies_reports/commuter-parking-verus-transit-oriented-development.pdf
3	Academic Article	Parking Policy for Transit-Orientated Development: Lessons for Cities, Transit Agencies, and Developers. CA, USA	http://www.reconnectingamerica.org/assets/Uploads/dallasbrief3.pdf
4	Academic Article	An analysis of park-and-ride provision at light rail stations across the US	https://www.researchgate.net/publication/256374540
10	Best Practice	Best Practices in TDM	http://www.seattle.gov/transportation/docs/ump/07%20SEATTLE%20Best%20Practices%20in%20Transportation%20Demand%20Management.pdf
11	Best Practice	TOD Best Practices	http://www.riderta.com/tod/bestpractices
20	Guidance	TCRP Report 95 - Travellor Response to System Changes	http://www.trb.org/Publications/TCRPReport95.aspx
21	Guidance	TCRP Report 153 - Guidelines for Providing Access to Public Transport Stations	http://www.reconnectingamerica.org/assets/Uploads/20120327tcrprpt153.pdf
30	Case Study	Seattle P+R	
31	Case Study	Wellington Station, Boston, MA P+R	
32	Case Study	Ottowa P+R, ON	http://www.octranspo.com/routes/gold_permit_parking
33	Case Study	Chapel Hill, New P+R Environmental Assessment, Ottowa, ON	http://ottawa.ca/en/city-hall/public-consultations/transit/notice-completion
34	Case Study	Deux-Montagnes Station Montreal P+R	
35	Case Study	North Port P+R, SCAT, FL P+R	
36	Case Study	Car Pooling Calgary	https://www.calgaryparking.com/findparking/carpool
37	Case Study	Calgary Transit Park and Ride Policy	https://www.calgarytransit.com/calgary-transit-park-ride-policy
38	Case Study	Park and Ride in Calgary - Review of Parking Management Options	https://www.calgarytransit.com/sites/default/files/reports/park-and-ride-in-calgary-review-of-parking-management-options.pdf
39	Case Study	A Review of Calgary Transit: Park and Ride	http://www.spuryyc.org/wp-content/uploads/2016/05/LRT-Park-and-Ride-Report-2016.pdf
40	Case Study	GO Transit Rail Parking and Station Access Plan	http://www.metrolinx.com/en/regionalplanning/projectevaluation/studies/GO_Transit_Rail_Parking_and_Station_Access_Plan_EN.pdf
41	Case Study	Milliken Go Station, ON	
42	Case Study	Lot Oak Park Ave, Commuter Lot Village, Tinley Park, IL, USA	
43	Case Study	Leased Lot, St, John the Baptist Church, Winfield, IL, USA	
44	Case Study	Shared Lot, Oak Park Avenue, Commuter Lot Village, Tinley Park, IL,	
45	Case Study	GO Transit: Fact Sheet	http://www.gotransit.com/public/en/aboutus/GO%20Info%20To%20Go_EN_Jan%202017.pdf
46	Case Study	Proposed Link light rail neighborhood parking plan for Southeast Seattle station areas	http://www.seattle.gov/transportation/parking/docs/lrp/linkparkingmailer_5-09.pdf
50	News Article	Seattle P+R Fees	http://komonews.com/archive/paid-parking-coming-to-sound-transit-park-and-ride-locations
51	News Article	TransLink's new $4.5M Surrey park-and-ride lot empty	http://www.cbc.ca/news/canada/british-columbia/translink-s-new-4-5m-surrey-park-and-ride-lot-empty-1.2497799
60	Passenger Numbers	2015 LRT Passenger Counts: Capital and Metro Lines	https://www.edmonton.ca/transportation/RoadsTraffic/LRT_2015PassengerCount_Capital-Metro_April2016.pdf
61	Passenger Numbers	Transit Ridership Report, Q3 2015. American Public Transportation Association	http://www.apta.com/resources/statistics/Pages/RidershipArchives.aspx
62	Passenger Numbers	Toronto Transit Commission Subway Ridership, 2014	https://www.ttc.ca/PDF/Transit_Planning/Subway_ridership_2014.pdf
63	Passenger Numbers	2010 Census	https://factfinder.census.gov/
64	Passenger Numbers	Quarterly Service Performance Review: Fourth Quarter, FY 2016, April - June	http://www.bart.gov/sites/default/files/docs/QPR_Report_FY2016-q4_FINAL.pdf
65	Passenger Numbers	ETS Park & Ride Report - Fall 2016 (City of Edmonton)	
66	Passenger Numbers	Sound Transit Operations: August 2016 Service Performance Report	http://www.soundtransit.org/sites/default/files/20161005-august-2016-service-performance-report.pdf
70	Presentation	Presentation - Future of Transit, Portland, OR, USA	https://trimet.org/pdfs/ontap/future-of-transit-and-transportation.pdf
71	Presentation	DART / UBER Transit Venture	https://caltransit.org/cta/assets/File/2015%20Fall%20Conference/Presentation%20Files/OPS-TNCs%20-%20Grinnell.pdf
80	Review	Best Practice Review - TACTRAN, Scotland	http://www.tactran.gov.uk/documents/3BestPracticeReviewFinal3004.pd
81	Review	Best Practice Guide - Virginia Dot, Virginia, US	http://www.virginiadot.org/travel/resources/parkAndRide/Final_PR_Best_Practices_021113.pdf
82	Review	Getting the Parking Right for Transit Orientated Development	http://metro.kingcounty.gov/up/projects/right-size-parking/pdf/getting-the-parking-right-transit-oriented-development.pdf

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No.	Resource Type	Title	URL (At Time of Reporting)
83	Review	How to Develop a Successful Carpool to Rail Program, San Francisco Bay Area, CA, USA	https://511contracosta.org/wp-content/uploads/2008/08/carpooltorailwhitepaper.pdf
90	Strategy	Go Parking Study - SDG	
91	Strategy	Virginia (VDOT) P+R Investment Study, VA, USA	http://www.virginiadot.org/travel/parkride/investment_strategies.asp
92	Strategy	TACTRAN Park and Ride Strategy, Scotland	http://www.tactran.gov.uk/documents/1ParkandRideStrategyFinal.pdf
93	Strategy	Seattle, WA, USA	https://www.wsdot.wa.gov/research/reports/fullreports/830.1.pdf
94	Strategy	Sestran, Southeast Scotland	http://www.sestran.gov.uk/files/SEStran%20Park%20and%20Ride%20Strategy.pdf
95	Strategy	Texas A&M University, P+R Summary Document	https://mobility.tamu.edu/mip/strategies-pdfs/system-modification/technical-summary/Park-And-Ride-Lots-4-Pg.pdf
96	Strategy	Access and Parking for Transit-Orientated Development, RTA, IL, USA	https://todresources.org/app/uploads/sites/2/2016/06/tod_parking_and_access.pdf
97	Strategy	Metrolinx Access Strategy Presentation (SDG), Toronto, ON	https://www.actcanada.com/docs/default-source/summit-2012/3-joshua-engel-yan-steve-bishop--station-parking--metrolinx-sdg.pdf?sfvrsn=2
98	Strategy	Vancouver P+R Policy, BC	http://www.translink.ca/-/media/Documents/plans_and_projects/10_year_plan/2013_plans/Park%20and%20Ride%20Policy.pdf
99	Strategy	Presentation Montreal, QC (French)	https://www.amt.qc.ca/Media/Default/pdf/section7/Mercredis/presentation-mercredis-amt-2015-10-07.pdf
100	Strategy	Ottawa Transport Strategy, ON	http://documents.ottawa.ca/sites/documents.ottawa.ca/files/documents/tmp_en.pdf
101	Strategy	Report Montreal, QC (French)	http://www.cremtl.qc.ca/sites/default/files/upload/documents/publications/2014-guide_stationnement_2_1.pdf
102	Strategy	First / Last Mile Strategies Study	https://www.rideuta.com/-/media/Files/Studies-Reports/UTAFirst_LastMileFINALCOMP1.ashx?la=en
103	Strategy	The City of Calgary: Municipal Development Plan (2009)	https://www.calgary.ca/PDA/pd/Documents/planning_policy_information/mdp-municipal-development-plan.pdf
104	Strategy	Making Travel Easier: Business Plan 2016/17 (Metrolink)	http://www.tfgm.com/Corporate/Documents/AnnualReportsBusinessPerformancePlans/business-plan-2016-17.pdf
105	Strategy	Greater Manchester's Thrid Local Transport Plan: 2011/12 - 2015/16	http://www.tfgm.com/ltp3/Documents/LTP3_Summary_060511.pdf
106	Strategy	Transit-Orientated Development Policy (BART, 2016)	http://www.bart.gov/about/planning/policies
107	Strategy	The Way We Move: LRT for Everyone (Edmonton, 2015)	https://www.edmonton.ca/documents/PDF/LRT_for_Everyone.pdf
108	Strategy	Policy Number C554A: Park and Ride (Edmonton, 2016)	https://www.edmonton.ca/city_government/documents/PoliciesDirectives/C554A.pdf
109	Strategy	BART Station Access Policy (2016)	https://www.bart.gov/sites/default/files/docs/BART%20Access%20Policy%20-%20Adopted%202016-06-09%20Final%20Adopted.pdf
110	Strategy	Regional Transit Long-Range Plan (Sound Transit, 2014)	http://www.soundtransit.org/sites/default/files/documents/pdf/projects/lrpupdate/2015123_lrpupdate.pdf
111	Strategy	Strategic Plan for Pulic Transportation 2011-2021 (King County Metro, 2015)	http://metro.kingcounty.gov/planning/pdf/2011-21/2015/metro-strategic-plan-042816.pdf
112	Study	Assessing P+R Impacts - Best Practice Review, USA	http://www.dot.ca.gov/newtech/researchreports/preliminary_investigations/docs/park_and_ride_preliminary_investigation_6-2-10.pdf
113	Study	Parking Management Pilot Project for Introducing Premium Parking, Seattle, WA, USA	http://www.soundtransit.org/sites/default/files/documents/pdf/rider_guide/parking/20150403_rpt_parkingpilot_drafteval.pdf
114	Study	UBER Ridesharing Trial, Summit, NJ, USA	https://www.cityofsummit.org/formcenter/parking-services-8/summit-ridesharing-program-52
115	Study	Jacksonville P+R, FL, USA	http://assets.jtafla.com/Documents/General/park-and-ride-final-draft-with-cover/1115/park-and-ride-final-draft-with-cover.pdf
116	Study	Evaluation of Parking Management Systems, Chicago Area, IL, USA	http://ntl.bts.gov/lib/30000/30500/30588/14432.pdf
120	Web Article	Parking Strategies for Transit Orientated Development, USA	http://www.masstransitmag.com/article/10286900/parking-strategies-for-transit-oriented-development
121	Web Article	P+R Pricing in Multifamily Developments, Seattle, WA	http://metro.kingcounty.gov/programs-projects/multifamily-park-ride/pdf/park-and-ride-pricing-in-multi-family-development.pdf
122	Web Article	Redwood City Parking and Transportation Policy - Lessons for Palo Alto, San Francisco Bay Area, CA, USA	http://www.paloaltoforward.com/redwood_city_transportation_lessons_for_palo_alto
130	Website	Translink website	http://www.translink.ca/
131	Website	Go Transit website	http://www.gotransit.com/
132	Website	Vancouver Car Pool P+R	http://www.translink.ca/en/Getting-Around/Driving/Carpooling.aspx
133	Website	Montreal P+R Public Information (French)	https://www.amt.qc.ca/fr/actualites/projets/stationnements-incitatifs
134	Website	Northlands Private Parking Lot Conversion, Edmonton, AL	http://www.northlands.com/guest-information/parking/park-and-ride/
135	Website	Parking Information for Public, BART, Union City, San Francisco Bay Area, CA, USA	http://www.ci.union-city.ca.us/departments/parking-program/city-parking-at-bart
136	Website	Carpool website for San Francisco Bay Area	http://511.org/carpool-vanpool/carpool/overview
137	Website	Guaranteed Ride Home, Edmonton, Minneapolis St. Paul, MN, USA	http://www.metrotransit.org/guaranteed-ride-home
138	Website	Calgary Transit website	https://www.calgarytransit.com
139	Website	OC Transpo (Ottawa) website	http://www.octranspo.com/
140	Website	Winnipeg Transit website	http://winnipegtransit.com/
141	Website	TTC (Toronto) website	http://ttc.ca/
142	Website	Metrolink (Manchester, UK) website	http://www.metrolink.co.uk/
143	Website	First Group (Manchester, UK) website	https://www.firstgroup.com/greater-manchester/routes-and-maps/park-a

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No.	Resource Type	Title	URL (At Time of Reporting)
144	Website	BART Website	http://www.bart.gov
145	Website	City of Edmonon website	https://www.edmonton.ca/ets/regular-park-and-ride.aspx
146	Website	Sound Transit Website	http://www.soundtransit.org

END

B Edmonton Park and Ride Lots Summary

Existing Edmonton Park and Ride Facilities

The following existing Edmonton Park and Ride facilities have been reviewed:

- Clareview LRT Station
- Belvedere LRT Station
- Stadium LRT Station
- Century Park LRT station
- Meadows
- Lewis Farms
- Eaux Claire
- Davies (Existing) and Davies Valley Line LRT (Future)
- Northlands Coliseum (Private)

Table 1: Clareview LRT Park and Ride

Element	Description
Stalls	1393
Disabled Parking	24
Car Pool	4
Paid	577 paid stalls - $50 per month
Kiss and Ride	Yes
Bicycle Provision	50 approximately (not covered)
Transit Connection	LRT and Bus Transit Centre
Peak Service Frequency	LRT- 5 minutes
Construction	Dedicated with Hard surfacing, gravel extension
Lighting	Yes
Walk Links	Limited
Maximum Walk Distance	320 metres
Planting	Yes
Adjacent Land Use	Residential, Education, Box Retail
Local Walk Links	Limited over Wider Area
Distance from CBD	8.7km

Table 2: Belvedere LRT Park and Ride

Element	Description
Stalls	761
Disabled Parking	15
Car Pool	5
Paid	129 paid stalls - $50 per month
Kiss and Ride	Yes
Bicycle Provision	10 approximately (not covered)
Transit Connection	LRT and Bus Transit Centre
Peak Service Frequency	LRT - 5 minutes
Construction	Dedicated and Hard surfacing
Lighting	Yes
Walk Links	Limited
Maximum Walk Distance	330 metres
Planting	Limited
Adjacent Land Use	Residential, Industrial
Local Walk Links	Residential – Good, Industrial - Limited
Distance from CBD	6.6km

Table 3: Stadium LRT Park and Ride

Element	Description
Stalls	520
Disabled Parking	9
Car Pool	5
Paid	163 paid stalls - $50 per month
Kiss and Ride	No
Bicycle Provision	8 approximately (not covered)
Transit Connection	LRT and Bus Transit Centre
Peak Service Frequency	LRT - 5 minutes
Construction	Dedicated and Hard surfacing
Lighting	Yes
Walk Links	Limited
Maximum Walk Distance	380 metres
Planting	Limited
Adjacent Land Use	Residential, Stadium
Local Walk Links	Good
Distance from CBD	2.6km

Table 4: Century Park LRT - Park and Ride

Element	Description
Stalls	1323
Disabled Parking	21
Car Pool	0
Paid	912 paid stalls - $50 per month
Kiss and Ride	Yes
Bicycle Provision	20 approximately + additional facility on over bridge
Transit Connection	LRT and Bus Transit Centre
Peak Service Frequency	LRT - 5 minutes
Construction	Temporary, gravel
Lighting	Yes
Walk Links	No
Maximum Walk Distance	400 metres
Planting	No
Adjacent Land Use	Residential, Box Retail
Local Walk Links	Good
Distance from CBD	9.5km

Table 5: Meadows Transit Centre Park and Ride

Element	Description
Stalls	254
Disabled Parking	6
Car Pool	0
Paid	0
Kiss and Ride	No
Bicycle Provision	24 Approximately
Transit Connection	Transit Centre (Bus only)
Peak Service Frequency	Bus – 30 Minutes
Construction	Dedicated with hard surfacing
Lighting	Yes
Walk Links	Limited (majority of users will walk though parking)
Maximum Walk Distance	220 metres
Planting	Yes
Adjacent Land Use	Box Retail
Local Walk Links	Complete
Distance from CBD	10.9km

Table 6: Lewis Farms Transit Centre Park and Ride

Element	Description
Stalls	613
Disabled Parking	9
Car Pool	0
Paid	0
Kiss and Ride	NO
Bicycle Provision	18 approximately
Transit Connection	Bus
Peak Service Frequency	15 Minutes
Construction	Dedicated with hard surfacing, gravel extension
Lighting	Yes
Walk Links	Yes
Maximum Walk Distance	360 metres
Planting	Yes
Adjacent Land Use	Box Retail
Local Walk Links	Good
Distance from CBD	11.7km

Table 7: Eaux Claire Transit Centre Park and Ride

Element	Description
Stalls	391
Disabled Parking	8
Car Pool	0
Paid	0
Kiss and Ride	Yes
Bicycle Provision	80 approximately
Transit Connection	Bus
Peak Service Frequency	15 minute
Construction	Dedicated with hard surfacing
Lighting	Yes
Walk Links	Limited
Maximum Walk Distance	300 metres
Planting	Yes
Adjacent Land Use	Residential, Box Retail
Local Walk Links	Residential – limited, Box Retail - limited
Distance from CBD	8.6km

Table 8: Davies - Park and Ride

Element	Description (Current)	Description (Future Valley Line)
Stalls	456	1400
Disabled Parking	0	Yes
Car Pool	0	Yes
Paid	0	Yes
Kiss and Ride	0	Yes
Bicycle Provision	0	Yes
Transit Connection	Bus	LRT and Bus Transit Centre
Peak Service Frequency	Bus -5 Minutes	LRT - 5 minutes
Construction	Gravel	Dedicated with hard surfacing
Lighting	Yes	Yes
Walk Links	Limited	Good
Maximum Walk Distance	150	150
Planting	NO	Yes
Adjacent Land Use	Industrial	Industrial
Local Walk Links	Limited	Limited
Distance from CBD	5.5km	5.5km

Table 9: Northlands Coliseum Private Park and Ride

Element	Description
Stalls	654
Disabled Parking	0
Car Pool	0
Paid	100%
Kiss and Ride	0
Bicycle Provision	0
Transit Connection	LRT
Peak Service Frequency	LRT - 5 minutes
Construction	Dedicated and Hard surfacing
Lighting	-
Walk Links	Limited
Maximum Walk Distance	500 metres
Planting	Limited
Adjacent Land Use	Residential, Stadium
Local Walk Links	Limited
Distance from CBD	8.6km

CONTROL INFORMATION

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