Greater Hobart Park and Ride Investigation

Strategic Planning Guidelines

Barry Watkins & Associates

Client Department of State Growth, Tasmania

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Barry Watkins & Associates Pty Ltd

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1. Introduction

1.1 The purpose of this guideline

This document sets out strategic planning principles to guide the development of multi-modal access options in Greater Hobart including Park and Ride, Kiss and Ride and Bike and Ride infrastructure.

The intent of this document is to assist in:

- Guiding the planning and provision of Park and Ride facilities in the Greater Hobart area;
- Clarifying where and when investment in Park and Ride should be made; and
- Guiding the management of Park and Ride facilities to maximise their effectiveness as part of the wider transport system and to ensure investment in Park and Ride represents an efficient investment.

1.2 Why provide Park and Ride in Hobart?

Like many cities, Hobart has a high concentration of employment and education facilities in the CBD, with nearly 50 per cent of employment in the Southern Tasmania located in Hobart CBD[1]. This contributes to high radial peak-directional travel demand across the transport network in the AM and PM peaks. In Greater Hobart, 2016 census data shows 70.3 percent of people travelled to work by car, mainly as the sole occupant of the vehicle, while only 5.2 percent travelled to work using public transport[2].

Outside of Hobart CBD, employment centres within the Clarence and Glenorchy local government areas also contribute to peak congestion and weekday demand for transport services. Congestion is further exacerbated by geographically and physically constrained key corridors, particularly the Southern Outlet, Tasman Highway, Brooker Highway and where the Southern Outlet and Sandy Bay Road meet the Macquarie/Davey Street couplet.

Hobart also has dispersed residential growth patterns and high demand for residential growth in greenfield areas. New residential growth is planned in areas to the south including in and around Kingston and Margate in the Kingborough local government area, to the east in Rokeby, Tranmere, Risdon, Upper Midway Point and Sorrell, and to the north around Claremont, Brighton, Old Beach and Bridgewater. Growth in these areas will add additional demands on the road network and worsen congestion in key corridors.

Further, the nature of development in Greater Hobart has resulted in previously rural areas becoming peri-urban areas with low density residential development. These areas are difficult and expensive to serve with public transport.

There is an opportunity in Greater Hobart to alleviate congestion by encouraging more public transport use for commuting. However, without investment in quality public transport infrastructure the challenges associated will reliance on single occupancy private vehicle commuting trips will only increase as Greater Hobart continues to grow. Park and Ride facilities are one mechanism through which additional uptake in public transport usage could be achieved, particularly for persons travelling to work in the Hobart CBD.

1.3 Aim and Objectives of Park and Ride

The aim of investing in Park and Rides in Greater Hobart is to encourage greater use of public transport in key road corridors that are either already congested or are becoming increasingly congested.

The objectives of providing Park and Ride facilities in Greater Hobart are to:

- Make public transport more attractive by increasing its convenience and accessibility for customers.
- Increase public transport demand in key corridors to enable efficient service provision.
- Reduce congestion by diverting private vehicle trips to less congested parts of the road network and encouraging the use of more space efficient modes of travel.

[1] Southern Tasmanian Councils Authority, 2018, *Southern Tasmania Regional Land Use Strategy 2010–2035 – amended 2018*, Southern Tasmanian Councils Authority.
[2] Australian Bureau of Statistics, 2017, *2016 Census Greater Hobart Quick Stats*, Australian Bureau of Statistics, retrieved 11 June 2019, <https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/6GHOB>.

2. Understanding Park and Ride

2.1 Why customers use Park and Rides

Park and Rides facilities allow a customer to drive for part of their total journey, often from their home, to a location where they can park their car and then catch public transport for the rest of their journey. This forms a distinct access mode that can attract additional customers to public transport.

Ideally, users would walk to their local bus stop and access the public transport network directly. However, there are many persons for whom this does not represent a viable or desirable travel option, which may be for a number of reasons, including:

- their residence is too far from a local bus stop;
- they have impaired mobility, which limits the distance they are able to walk to a stop;
- they feel unsafe walking to their local stop;
- local services are inconvenient: too infrequent, commence too late or finish too early;
- they need to make an intermediate stop on their journey (e.g. shopping on the way home from work); or
- local services don't travel where they need to go.

Kiss and Ride facilities are designed for customers to be dropped off and picked up at a public transport stop or station as part of a journey including car travel. This might be by a friend or family member, but could also be by taxi or on-demand transport provider. The recent emergence of the latter category by providers such as Uber can add an important 'last-mile' transport option for customers and many cities are now integrating this concept into the planning of public transport systems. Kiss and Ride spaces are typically included in Park and Rides, and may also be located at public transport stations and interchanges.

Bike and Ride facilities benefit customers who wish to cycle for part of their journey, for many of the same reasons listed above for Park and Rides. Additionally, these facilities can be attractive to persons who would generally wish to cycle for further but are not supported by adequate cycling infrastructure, such as in highway environments. Over shorter distances, cycling is an effective and efficient way to access the public transport network and also helps to extend the catchment for public transport services. Bike and Rides can be integrated into Park and Rides, public transport stations and interchanges, and also as standalone facilities. Proper integration of the cycle network and public transport network can increase the number of Bike and Ride trips.

2.2 The benefits of Park and Ride

A well-planned Park and Ride can help to improve accessibility, mobility and decrease congestion on key corridors. Park and Rides are an infrastructure solution as part of a suite of public transport improvements that can enhance the public transport user experience.

Park and Ride facilities can provide the following benefits:

- Extending the reach of the public transport network in areas where walking, cycling or the provision of feeder buses are either impractical or inefficient.
- Helping to encourage new riders onto public transport in areas with new routes or where there is a need to reduce congestion on key corridors, and/or making better use of existing services.
- Reducing private vehicle kilometres travelled and therefore reducing the costs associated with congestion including private costs and public costs such as pollution and productivity loss.
- Concentrating the demand for public transport services to increase the level of service provided and the economic viability of services.
- Reducing the effects of informal and ad hoc Park and Ride in areas where Park and Ride is not appropriate.

- Reducing parking demand in the CBD and major employment areas where land is more valuable, by moving it to areas where land is cheaper.
- Reducing single occupancy private vehicle trips to increase the wider economic benefits in the transport system, by freeing up space for higher value trips such a freight, trades and services movements.
- Increasing the usefulness and convenience of public transport for customers.
- Reducing household travel costs by reducing distances travelled by private vehicle.
- Improve regional parking demand management through strategic coordination resources across local and state government jurisdictions.

Whilst the benefits of Park and Rides are numerous, research has also shown that when poorly planned, Park and Rides can have negative transport, economic and land use consequences. Careful consideration must be given to the planning and provision of Park and Rides.

2.3 The costs and risks of Park and Ride

Park and Rides, although useful, are not always the most economically efficient way of increasing public transport use. Depending on the location, construction and subsequent utilisation Park and Rides can end up being very expensive method of increasing public transport use. An economic assessment of the costs of the provision of Park and Ride should be undertaken as part of the planning process.

The costs of Park and Rides that need to be included in a feasibility assessment are:

- land acquisition costs;
- construction costs - the construction of a single parking space can cost between $8,000 and $12,000 for at-grade spaces and substantially higher for multi-storey structures;
- ongoing maintenance costs; and
- costs of any additional public transport service provision required.

Park and Rides can also take valuable land away from other economically beneficial land uses. Consequently, site selection should consider whether a Park and Ride is the most appropriate use of the site and what development opportunities will be sacrificed if a Park and Ride is constructed.

2.4 Unintended consequences of Park and Ride

Research of experiences in other cities has shown there can be unintended consequences associated with providing Park and Ride.

A key observation from Zjilstra et al.[3] is that no more than 50% of spaces within a Park and Ride are used by people who have switched from driving. Much of the remaining demand for Park and Ride is not from new public transport users, but from existing users who previously completed the whole trip by public transport and have switched to drive part of the journey instead. This generates a reduction in public transport usage on existing services when measured in passenger-km, and creates increased pressure on the road network through an increase in vehicle-km. While this is generally undesirable, a counterargument is that it creates a better outcome for these customers, who are provided with greater choice and may find it more convenient to drive for part of their journey which may include intermediate destinations less accessible by public transport.

Zjilstra also found that some of the capacity of a Park and Ride facility will be used by non-travelling persons. The number of cars parked by legitimate users of the Park and Ride varied from 64% to 88% of the parking spaces provided. The remaining 12% to 36% of spaces are either unused or used by persons parking there for other reasons.

[3] Zijlstra, Vanoutrive and Verhetsel (2015), *A meta-analysis of the effectiveness of park-and-ride facilities*. European Journal of Transport and Infrastructure Research, September 2015.

Additional issues that have been observed to be created following the establishment of Park and Ride facilities inlcude:

- Community pressure for costly expansion at popular locations or new locations that may not be unsuitable.
- Park and Rides becoming fully utilised before the end of the AM peak and then excluding other customers both in the peak and off-peak periods.
- Spill over parking in surrounding streets, resulting from high demand or poor management, causing annoyance for local businesses and residents.
- A need to invest in additional transport improvements including additional bus services, cycling infrastructure, and upgrades to the surrounding road network.
- Increased localised traffic congestion caused by vehicles accessing the Park and Ride.
- Reduced demand for existing bus services in the catchment upstream of the Park and Ride.
- Increased demand for bus services at the location of the Park and Ride, exceeding capacity on key corridors.
- Park and Ride not providing the expected return on investment or only providing marginal benefits.
- An increase in land values in the area surrounding a Park and Ride resulting from the improvements to create high-frequency, quality public transport services at the site. The increased land values may reach the point where a Park and Ride is no longer the best use for the site.

2.5 Additional factors that influence the success of Park and Ride

Park and Rides alone are not likely to change travel behaviour. There are many other factors that will influence the utilisation Park and Rides and the attractiveness of public transport services.

The most important measure of the success of Park and Rides are travel time and cost. It is, therefore, important that a Park and Ride and public transport trip is perceived as competitive with an equivalent direct car trip, this includes the reliability, quality of service, travel time, and costs.

Travel time includes, the time to access the facility, the time waiting for services, and length of the public transport trip. Costs include vehicle maintenance, fuel and parking costs. These factors need to be included in the assessment of the attractiveness and competitiveness of Park and Rides.

The following factors should be recognised as key influences on the attractiveness and success of Park and Rides:

- Availability and price of destination parking - Cheap and plentiful parking at the destination will make a direct private vehicle trip more attractive than a public transport trip, especially when a private vehicle trip is also quicker and easier.
- The quality of public transport services – if public transport is to compete with a private vehicle trip then the services must be as direct as possible and frequent enough to offer flexibility and reliability. Bus priority measures on key routes help to improve the reliability of services and reduce overall trip length. The quality and comfort of the buses is also very important.
- The quality of the Park and Ride – Perceptions of safety, security, and ease of access of the facility will also influence the decision to use the Park and Ride.
- The speed and directness of the public transport trip - It is difficult for public transport trip to compete with a direct private vehicle trip, therefore it is important to implement measures where possible to decrease the overall journey time including the use of bus priority measures, such as intersection queue jumps and bus lanes.
- Availability and pricing of parking at Park and Ride facilities – If Park and Ride is priced and the surrounding streets are not, it is likely that Park and Ride will not be well-utilised spill-over may occur. Further where are Park and Rides are over-utilised and customers are unable to reliably find a parking space, they will be less likely to use them, or if they do, spill-over parking may occur.
- Promotion and information – If potential users are not aware of the location of Park and Rides, or what facilities are on offer then they are less likely to be well-utilised. It is important to actively promote the use of specific locations to encourage use and also to manage demand.

- Typically, most demand for Park and Ride is usually from commuting trips on weekdays. But to improve greater overall utilisation and effectiveness the use of Park and Rides can also be encouraged outside of these times, including at weekends and for special events as part of a wider travel demand management.

3. Integrated planning of Park and Rides

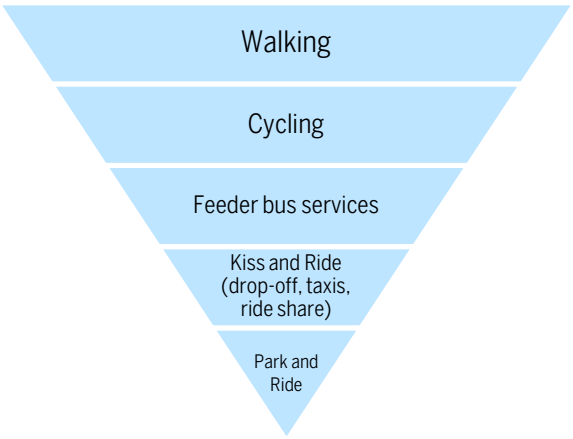
Park and Ride facilities are a key element of transport network and its supporting infrastructure. However, they are also a space-intensive land use and these facilities must not be planned in isolation. Feasibility must be assessed with consideration of:

- Planned improvements of the public transport system (services, vehicles and other supporting infrastructure);
- Planned improvements of the road network; and
- Existing, planned and desired local land use outcomes.

3.1 Providing multi-modal access to public transport

Park and Rides should be provided with consideration of a hierarchy of access to public transport, with the most economical and beneficial solutions being prioritised first. This model has been widely adopted by public transport agencies and is used to guide the complex planning and design of public transport interchanges. This hierarchy is applicable to wider context of access to the public transport network and specifically within a Park and Ride facility.

Figure 1: Recommended public transport access hierarchy



All public transport journeys begin and end with walking. Pedestrian access to stops and stations by walking should always be given the highest priority at both the macro and micro levels.

- At the macro level, this means ensuring Park and Rides are not placed in areas where public transport is easily accessed by walking. In areas where public transport service levels are relatively good, investment in improving footpaths, other walking infrastructure and bus stop infrastructure may be a more appropriate alternative to providing Park and Ride.
- At the micro level, Park and Rides must be designed with consideration of walking access between the parking space sand bus stops and walking access to any surrounding land uses.

Where safe and direct access to the public transport network is provided by the cycle network, Bike and Ride facilities may be an appropriate alternative or complementary solution to providing Park and Rides at stops, particularly in urban areas.

Sites should also allow for Kiss and Ride to help reduce single occupancy private vehicle trips and to allow customers who cannot drive, for example some people with disabilities, young people and some older people, to also have safe and easy access to services.

4. Park and Ride Location

4.1 Strategic location

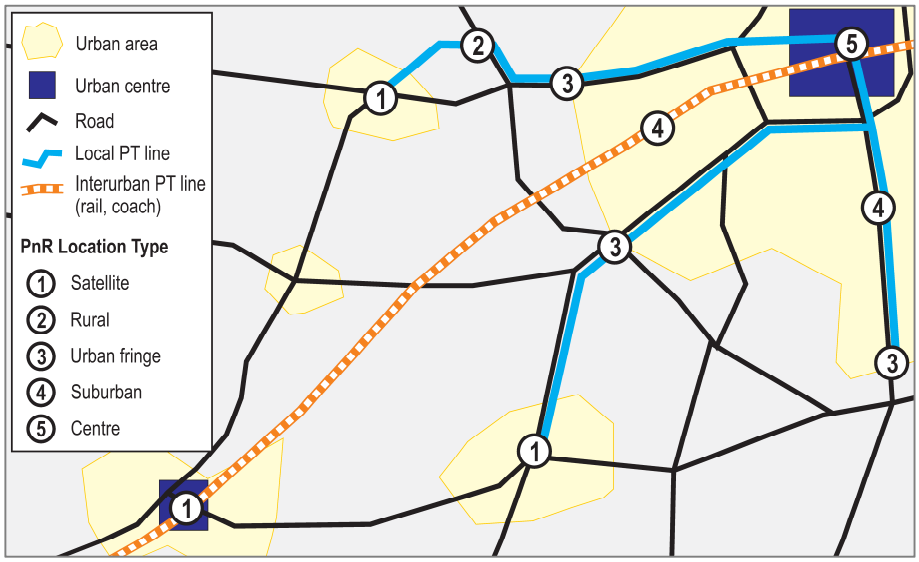
Before choosing specific sites for Park and Ride, a strategic assessment of locations at the network and corridor level helps determine priority for investment and gives an understanding of areas that may be suitable for Park and Rides.

In an assessment of success factors for different types of Park and Rides, Zijlstra et al.[4] developed a classification for Park and Rides based on their location. Adapted for the Hobart context, the five classifications are presented below.

- Satellite. Typically located within a town centre adjacent to a rail or bus station.
- Rural. Located away from significant urban development, outside the urban area.
- Urban Fringe. Located on the periphery of the urban area, to intercept inbound commuters.
- Suburban. Located within the urban area.
- Centre. Located at the destination location in the city centre. Rarely used and not recommended.

Existing Park and Ride facilities in Hobart are typically either satellite (Sorell, New Norfolk) or suburban (Moonah, Kingston).

Figure 2: Park and Ride location types (adapted from Zijlstra et al., 2015)



A review of this and other research, best practice principles for strategically selecting areas for Park and Ride locations should consider the following factors:

- Park and Rides should be located closest to the origin of a commuting trip, where the trip can be intercepted as early as possible and as far as possible from city centre. The location should be a significant distance from the CBD, preferably at least 10km and outside of any already congested inner urban areas.
- Park and Rides should be located where the connecting service provides a single-seat journey to the most likely destination - customers should not have to change buses after boarding at a Park and Ride.
- Park and Ride locations must have direct and frequent services available, and include off-peak and weekend services in both directions. A minimum standard of a bus every 15 minutes is required to meet the definition of Frequent Service, which is generally considered to be where customers are comfortable to 'turn up and go'. At this frequency, the average waiting time then becomes 7.5 minutes if customers are arriving randomly and without needing to plan their departure according to service timetables. Zijlstra et al found that a drop in

[4] Zijlstra, Vanoutrive and Verhetsel (2015), *A meta-analysis of the effectiveness of park-and-ride facilities*. European Journal of Transport and Infrastructure Research, September 2015

frequency from once every 10 minutes to once every 15 minutes results in approximately 8% fewer persons switching from driving to their destination.

- Park and Ride should be used primarily in locations where they will generate new public transport trips, both existing latent demand and new demand generated by residential growth.
- Park and Rides should be located outside of areas where the road network is already congested.
- Park and Rides are most economically justifiable in areas where the following are true:
  - residential densities are too low to justify feeder or direct service;
  - walking access to stops is difficult due to topography road network and land use;
  - available sites are of low economic value, or temporary sites can be developed as a form of land banking; or
  - existing bus services have capacity and/or services can be increased to meet any additional demand generated to avoid overcrowding on peak services.
- Park and Rides must not be used to replace local bus networks that serve reliant communities, including those that don't drive, unless alternative access is provided.

4.2 Site selection

Specific Park and Ride site selection requires a more detailed consideration of the appropriateness of nominated sites.

When selecting sites for consideration as Park and Ride facilities, a typical process will identify multiple location options through consultation with stakeholders who are familiar with the local area, and potentially through public engagement.

Sites identified as potential candidates will initially form a long list which needs to be assessed against a series of criteria and refined to only those sites that show genuine potential. This process may yield a short list, or a single preferred site, for which more detailed feasibility assessment can be undertaken.

Suggested criteria are presented below, but these should be refined as necessary to reflect the information available and any specific requirements of the local area in which the Park and Ride is to be located.

A suggested framework for scoring and assessing the criteria is presented in Appendix A.

4.2.1 Transport criteria

Existing Bus Service Provision: frequency and capacity

Bus services must be frequent enough to provide customers convenience and confidence that there will be a service available when they want to travel. Infrequent services reduce uptake of Park and Ride if customers believe they could drive to their destination in less time than it will take for the next bus to arrive. A minimum standard of a bus every 15 minutes is required to meet the definition of 'turn up and go' Frequent Service,

Bus services must also have adequate spare capacity to enable customers to board and/or to prevent buses from becoming overloaded closer to the CBD.

Although bus services can be increased to provide additional capacity and frequency, the cost of doing so can be substantial. Locations with adequate existing bus service provision should be prioritised over those that require improvement or investment in new services. Alternatively, in some instances larger buses can be used to increase capacity, although this also requires additional capital investment.

Proximity of Site to Existing Bus Services

Park and Rides should ideally be located on existing bus routes to avoid the need for services to be diverted to them. The diversion of services typically results in increased route lengths and slower journey times for other customers.

A Park and Ride location should preferably be adjacent existing bus stop, however it is noted that installing new bus stops is typically low-cost and low impact.

Travel Time Competitiveness

To be attractive to customers, bus services need to provide travel times to the Hobart CBD that are competitive with driving.

This criterion is assessed by comparing travel times estimated by Google Maps to reach the Hobart CBD. For driving, estimated travel times from sources ranging from travel time surveys to Google Map data can be used. For buses, the fastest available bus journey in the AM peak hour is used.

Site Visibility and Accessibility

This criterion relates to the degree to which a site is visible to and accessible by citybound traffic.

Site visibility is important as a passive means of advertising the presence of the Park and Ride. Sites with greater visibility to motorists are more likely to attract them to use it.

Site accessibility relates to the ease by which motorists can access the site from the surrounding road network. Accessibility in the inbound direction is a higher priority than the outbound direction.

Local Traffic Impact

Park and Rides are generators of traffic, which may result in increased noise and localised traffic congestion. Because of this, the potential location of the Park and Ride may be incompatible with adjacent land uses and not appropriate

Pedestrian and Road Safety

Vehicles need to be able to safely access a Park and Ride from the surrounding road network. Most road safety issues relate to the site entrance, particularly where car turning movements create conflicts with other traffic. The speed environment of the approaching roads is also a factor as access to and from higher speed roads creates increased risk.

Pedestrian safety mainly relates to the ability of Park and Ride customers to move between their parking space and the bus stops. Most Park and Ride sites require customers to cross the road in at least one direction of travel, and the ability to provide a safe crossing environment is paramount.

Bicycle Integration

Bicycle integration mostly relates to the ability of cyclists to access the site from the surrounding area in a direct and safe manner. Park and Ride facilities located close to quality cycle networks are likely to be more attractive to cyclists.

The ability to provide bicycle storage facilities must also be considered. Sites with good passive surveillance are preferred, along with sites with adequate space to provide secure bike cages.

4.2.2 Planning criteria

Planning Designation

This criterion relates to the Tasmanian Interim Planning Scheme, and the compatibility of the zoning of the site with the intended land use of a Park and Ride facility.

Environmental and Heritage Constraints

Constraints relating to environmental factors or heritage issues. Where constraints can be managed or mitigated, the cost or complexity of doing so needs to be considered.

Community Support

The degree to which community support or resistance is likely. Previous community feedback on the selected site or other developments in the local area may be suitable to assess the criterion without direct engagement.

Impact on Surrounding Land Uses (acoustic, visual, pollution)

The likelihood of a Park and Ride affecting adjacent land uses through acoustic, visual or pollution impacts.

Parking Overflow, Risk, Management and Mitigation

If a Park and Ride reaches capacity, customers unable to find a parking space are likely to park in surrounding streets, either legally or illegally. Opportunities to accommodate excess demand through future site expansion can be considered, along with the ability to implement effective management mitigation strategies (i.e. parking enforcement).

4.2.3 Cost and Constructability criteria

Site Ownership

Existing site ownership can be a significant determinant of the feasibility of establishing a new Park and Ride. Sites under public ownership, such as land within the road reserve, are typically easier to develop. Sites under private ownership may be able to be acquired but forced or negotiated acquisition can be costly and difficult.

Other Significant Constraints

Any other significant constraints that would need to be mitigated or overcome through design, including interventions outside the site itself such as drainage or road network improvements.

4.3 Locations where Park and Ride should be avoided

The effectiveness of Park and Ride to generate new public transport trips is dependent on the location of the facility. There are many places where Park and Rides are unsuitable and can have detrimental effects on public transport use, traffic and land use outcomes.

The following recommendations are made as to where to avoid Park and Rides.

- Generally, Park and Rides should be avoided in areas where existing bus services are already well-patronised via other access modes. This is because there is strong a likelihood that sites will divert existing public transport users, rather than attracting new users.
- Park and Rides should not be located in areas with good access to the public transport network by walking and cycling. Areas with potential demand in the walking and cycling catchment of a stop location should also be avoided.
- Park and Rides should be avoided in most existing urban areas, especially town and city centres because:
  - Land is more valuable in these locations and therefore it is not the highest or best use of a site; and
  - They will contribute to peak traffic congestion, which is particularly problematic in already congested areas.
  - An exception to this is when Park and Ride is used temporarily as a transition to other land uses. However, this should be clearly communicated and documented from the outset. A transition plan should be in place to minimise the difficulties associated with removing Park and Ride in the future.
- Ad hoc locations such as 'spare land' or sites considered inappropriate for other uses, or other low-cost, easily available sites should be treated cautiously when being considered for Park and Ride. While cost is an important consideration, sites should be chosen strategically to ensure that they deliver a high-value outcome rather than simply a low-cost outcome.
- Park and Ride sites should not be located where an existing bus route would need to be diverted to service the site, as such diversions increase the cost of service provision and impact other customers already on the bus. An exception to this is where a Park and Ride is located near the terminus of a bus route and changing or extending the route has an acceptable cost and negligible impact on existing customers.

4.4 Shared-use locations

In some cases, it may not be feasible to acquire a site for development of a Park and Ride. Alternatively, if Park and Ride is being used as a transitional approach to providing regular bus services while an area develops, the level of investment required to develop a Park and Ride may not be appropriate. Where either of these occurs, the use of existing car parks that have spare weekday capacity may be a workable solution. Examples of suitable alternative sites include carparks at

taverns, churches, entertainment and recreation centres. Existing carparks in areas where land uses or demand levels have changed over time may also be suitable.

There are pros and cons of using sites like these. Often these sites are already used as informal Park and Ride, and formalising this use can appease community and site owners. Use of these sites requires leasing agreements to be established and there may be limited control over the condition or quality of facilities provided. There is also a risk of lease termination. These sites may not be as visible to potential users and therefore greater effort may be needed to promote them may be needed. However, this is a low cost and sometimes fast solution to start providing Park and Ride in some areas.

5. Park and Ride Design

5.1 Park and Ride size

5.1.1 Estimating demand

Determining the appropriate size and capacity for a Park and Ride is challenging as there are relatively few techniques to estimate demand.

The most sophisticated approaches use advanced transport modelling tools (e.g. four-step strategic transport models) that can be developed to indicate the level of potential demand in any given location. A key limitation of these models is that they require calibration using baseline data of existing Park and Ride facilities, and preferably a large number of comparable facilities. Using these techniques in cities such as Hobart with few existing Park and Ride facilities can yield inconsistent and misleading recommendations.

Additional considerations in the demand estimation process can include:

- Current and future trip generation within the catchment, with and without desired mode shift, calculated using traffic modelling based on population statistics and demographic forecasts. If a Park and Ride is part of a planned initiative to increase mode share, it is useful to know how much of the targeted increase is achieved by each parking space provided.
- Ratio of cost of private vehicle trip cost vs public transport trip, as in some locations the cost of driving may still make it more desirable to drive than use the bus, thus a smaller number of customers will use the Park and Ride.
- Capacity of existing and proposed bus services. As customers will not be able to use a Park and Ride if they are unable to board a bus, it is necessary to ensure that adequate spare capacity on bus services will exist to accommodate Park and Ride users. For planning purposes, each bus has an average capacity of 50 customers, and it may be easier to contextualise the initial demand for Park and Ride by considering how many additional bus loads of passengers could be attracted to using public transport.

5.1.2 Size determination

Without a modelling-based approach, estimating demand and required capacity needs to take a pragmatic approach. If a general location for a Park and Ride has been determined, the resultant size of the facility may be guided by the size of available sites. This ad hoc approach does create the risk that a facility will be either too large or too small, but this aspect also needs to be considered when modelling approaches are used.

Regardless of the demand estimation process used, the design life of the facility must be considered and how the planned capacity responds to that design life.

- It may be appropriate to only build the Park and Ride large enough to meet short-term demand and wait to evaluate growth over the longer term. This approach creates the risk that the facility may reach its design life relatively quickly and be too small. If this risk exists, contingency planning should consider the potential for staged expansion or additional future facilities in the local catchment to absorb demand.
- If demand is expected to grow over time, a number of options are available:
  - Build the Park and Ride to meet the full, long-term demand. This single-stage approach is relatively simple, but the early delivery of unneeded capacity may not be an economically appropriate approach when compared to staged delivery. If there is a potential risk that the Park and Ride will be too large, contingency planning should consider what other uses could be achieved, such as overflow parking for nearby retail precincts or the future sale of part or all of the site.
  - If a staged approach is to be used, it is important that the land for the expansion of the facility is secured early. Ideally this should occur at the commencement of the project, with the area needed for future expansion designated for interim use.

5.2 Design characteristics

Park and Rides need to provide attractive, safe and useful facilities for customers. However, as the cost of constructing and maintaining Park and Rides is often high relative to the number of customers they attract, their design needs to be cognisant of the risk of overinvestment. All design needs to adhere to applicable standards as listed in Appendix B.

Successful design of Park and Ride facilities needs to consider factors both internal and external to the site:

External

- The provision of safe pedestrian access to and from the bus stops, including footpaths and crossings.
- Comprehensive and effective signage and information including wayfinding, bus timetables, and service information.
- Bus stop pairing, whereby inbound and outbound bus stops should be located in close proximity to each other and visually identifiable from each other.
- Attention given to safe vehicle access and egress to and from the Park and Ride, especially during peak periods.

Internal

- The provision of safe pedestrian access to and from the bus stops, including footpaths and crossings.
- Parking line marking to ensure efficient use of space.
- The provision of Kiss and Ride, walking and cycling access and Bike and Ride facilities.
- Application of CPTED principles.
- Features to increase safety and security such as lighting and CCTV where applicable.
- Design to minimise the walking distance to and from the stops to the parking spaces.
- The inclusion of spaces for specific users, closest to the bus stops, including disabled parking, motorcycle parking, electric vehicle spaces (including charging infrastructure) and possibly car-pool spaces.
- The possible co-location of any facilities to support PT operations, including layover and driver amenities.
- Water sensitive design, such as swales, detention ponds and permeable paving to mitigate the effects of runoff from impervious surfaces and to manage any flood risks.

5.3 Kiss and Ride

Kiss and Ride facilities should ideally be included within or adjacent to Park and Rides and need to be designed to be safe and easy to use. They provide a drop-off or pick-up zone for passengers arriving from, or leaving for, a public transport service. Taxis and ride-sharing services are also generators of passenger set-down and pick-up activity and if demand is higher enough, the provision of designated areas for these uses should be considered.

The following considerations should be applied to Kiss and Ride facilities:

- Dedicated Kiss and Ride zones should be clearly marked and easy for drivers to find.
- To prevent safety issues, informal Kiss and Ride should be restricted through the appropriate use of kerbside allocation and parking control.
- Kiss and Ride zones should not conflict with bus movements.
- Kiss and Ride zones should not conflict with cycle movements.
- As waiting times are longer when waiting for and picking up PT customers, pick up zones may need to be provided separate to drop off zones if space allows (e.g. set down only zones vs 10-minute waiting zones).
- Pick up zones should ideally offer weather protection, lighting and surveillance.
- On street Kiss and Ride is suitable, where it is safe, when traffic volumes are low and where kerbs and footpaths provide adequate access to bus stops.
- Kiss and Rides should meet the applicable Australian Standards for accessible design.

5.4 Bike and Ride

Bike and Ride facilities can, and generally should, be incorporated into Park and Ride facilities and other major public transport interchange locations. They are generally cheaper to provide than car parking spaces on a per-customer basis and are also more space efficient, with the equivalent of one parking space capable of accommodating up to eight bike spaces.

Bike and Ride can also be in decentralised locations, such as adjacent to busy stops in urban areas, where space allows and where safe cycling access to the stop is provided. These should be planned and provided as an integral part of investment in cycling and public transport infrastructure.

Quality Bike and Ride facilities also offer the following benefits:

- Increasing the range of access options available to public transport customers
- Extending the catchment of the public transport network
- Reducing congestion on local road networks
- Reducing demand for Park and Ride, and for parking at other public transport stops and interchanges
- Improving personal health and wellbeing by encouraging active transport

As highlighted in the *Bike and Ride Planning Technical Note*[5], best practice learnings for establishing Bike and Ride facilities in Hobart have been identified. Bike and Ride facilities should be:

- located where the cycle network and bus network meet, allowing cyclists to reach locations where bus services are provided. Locations with high frequency bus services will be most attractive.
- located where the immediate surrounding road network can provide for safe cycling, in addition to any segregated cycle paths.
- located as close as possible to the stop location to offer convenient access and passive surveillance of bike storage.
- designed to ensure security and to prevent vandalism and theft, including being well lit and potentially supported by CCTV.
- designed to meet the needs of different user types, e.g. secure bike facilities (cages, lockers) in conjunction with casual facilities (bike racks, bike shelters).
- provided for free or at a low cost, especially in locations where parking is provided for free.
- designed to provide access that minimises conflict with pedestrians and vehicles.
- well sign posted, both from the wider cycle network and locally within transport interchanges or Park and Rides.

The types of bike storage facilities suitable for implementation at Park and Rides or decentralised Bike and Ride locations include:

1. Bike racks – including a wide range of rack types for casual use
2. Bike shelters – for casual use with racks located indoors or under a shelter
3. Bike lockers - individual secure bike space
4. Bike cages – secure facility for multiple bikes

The suitability of the type of infrastructure is dependent on the location and a mixture of infrastructure types can be used in one location to meet different customer needs. There are pros and cons of each option, as discussed in greater detail in the *Bike and Ride Planning Technical Note* [5].

[5] Greater Hobart Park and Ride Investigation: *Bike and Ride Planning Technical Note.* Barry Watkins & Associates, November 2019.

6. Park and Ride Management

The success of Park and Rides is dependent on how well they are managed. There are specific measures that help to ensure Park and Rides are properly utilised. The aim is to ensure that parking is available for targeted users.

The following measures assist in managing Park and Rides:

- Gated access – This can be linked to smart ticketing. It has three key uses; firstly, it helps to monitor use and understand customer's travel patterns. Secondly, it can ensure spaces are specifically used by public transport customers. Thirdly, to make it easier to implemented pricing if required to assist in managing demand for parking at popular locations.
- Enforcement of parking restrictions – This includes enforcing any time-limits, ensuring parking is not blocking access or on footpaths to ensure parking can be efficiently utilised.
- Preferential parking – This can be controlled using pricing, permits or dedicated parking spaces.

6.1 Performance indicators - monitoring success

Monitoring the performance of Park and Rides is essential in ensuring Park and Rides offer the best possible customer experience, are properly utilised, and can be strategically planned for into the future.

A review of literature shows there is no one set way to monitor Park and Rides. However, regular monitoring and assessment of the following measures should be undertaken. This should include consideration of the following measures:

- Public transport patronage from Park and Ride locations – inbound in the peak and off-peak.
- Occupancy of Park and Ride spaces, including Bike and Ride facilities, both at specific locations and compared across all Park and Ride locations.
- Customer feedback on Park and Ride locations, facilities and related services.
- Capacity on services to and from Park and Ride locations.

Ideally Park and Rides should not be at 100 per cent capacity. Most cities reviewed and best practice guides suggest occupancy between 75 and 90 percent is ideal. With 85 percent occupancy commonly cited as trigger to investigate demand management tools. Ensuring there is always some availability is important because:

- It helps gives customers certainty that a parking space will be available when they arrive.
- It increases the attractiveness of the Park and Ride for customers not travelling in the peak, thus assisting in concentrating off-peak public transport service demand.
- It decreases the risk of spill-over parking occurring in surrounding streets.

Spill-over parking needs to be monitored and effectively managed, as it can become a nuisance for adjacent businesses and residents. Where spill-over occurs, it is usually a sign that the Park and Ride is either not designed well enough to encourage its use, or if it is full that demand exceeds capacity. in the case that demand is exceeding capacity, additional parking may be required, pricing may need to be introduced, or additional feeder services may be required to reduce demand.

6.2 Pricing

The choice to use Park and Ride and complete a trip by public transport is largely dependent on two factors: time and cost. Potential Park and Ride users have been shown to be very price sensitive with a low level of willingness to pay. So while pricing can contribute to maintenance costs of Park and Rides and is a very good tool for managing demand, it may not always be possible to price Park and Rides from the beginning.

The pricing of Park and Rides should reflect the demand for parking and consider the total cost of a trip. For example, the price of the parking and the public transport ticket should be less than the equivalent cost of a private vehicle trip including the price of destination parking.

Free parking provides an additional incentive for customers to use Park and Ride. Providing free parking is a good short-term approach if the intent is to attract new customers. However, as international experience has shown it is very difficult to introduce pricing once a Park and Ride is established. Therefore, it is preferable to identify ways to manage access from the outset and be able to incrementally introduce pricing should the need arise.

There are many ways to use pricing to manage demand for Park and Ride including:

- Restricting use of Park and Ride by providing parking for free only when Park and Ride users complete a trip from the Park and Ride using public transport.
- Inversely, where demand is high a small fee could be added for use of the Park and Ride use as part of the cost of the public transport trip.
- Pricing the Park and Ride separately to the public transport trip, charging just like at a regular car park.
- Pricing to give preferential use of spaces or a guaranteed parking spaces at a facility. For example, an annual permit that gives access to reserved spaces.
- Pricing of surrounding on-street parking to deter spill-over parking where surrounding on-street parking is in high demand.

Ideally pricing policy should be applied equitably across all Park and Ride sites in the network. Even though at some locations demand may not warrant pricing, or the need to attract users may require staged implementation of pricing in accordance with demand, the same policy should always be applied

Pricing should also demonstrate benefits to users such as improvements to the quality of facilities, guaranteed parking or bus service improvements.

APPENDIX A Site Assessment Methodology

A.1 Assessment approach

A.1.1 Identifying and refining a list of options

When selecting sites for consideration as Park and Ride facilities, a typical process will identify multiple location options through consultation with stakeholders who are familiar with the local area, and potentially through public engagement.

Sites identified as potential candidates will initially form a long list which needs to be assessed against a series of criteria and refined to only those sites that show genuine potential. This process may yield a short list, or a single preferred site, for which more detailed feasibility assessment can be undertaken.

Graduated scoring system

To facilitate the efficient filtering of site options, the assessment approach does not attempt comprehensive quantitative assessment, but rather a high-level review of factors including potential issues likely to be encountered and the likelihood that each site could successfully be developed as a Park and Ride facility.

To achieve this, a graduated scoring system is applied that provides a visual rather than numerical comparison against each criterion. This system, sometimes described as a 'traffic light' approach, applies one of four colours as a representation of the degree to which each site either meets a criterion, or performs better than the other sites. The graduated scoring system is presented in Table 1.

Table 1: Graduated scoring system

Score	Interpretation
●	Good. Meets criterion, or performs better than other sites.
●	Acceptable. Neutral, or performs adequately compared to other sites.
●	Poor. Fails to meet criterion, or performs worse than other options.
●	Unacceptable. Complete failure against criterion, yielding site unviable regardless of all other criteria. (not all criteria are capable of being scored as Unacceptable).

A.2 Criteria

The following criteria have been identified to assist in assessing and comparing Park and Ride site options. These criteria have been developed to ensure Park and Ride site selection reflect the best practice principles in planning Park and Ride.

A.2.1 Transport Criteria

Existing Bus Service Provision: frequency and capacity

Bus services must be frequent enough to provide customers convenience and confidence that there will be a service available when they want to travel. Infrequent services reduce uptake of Park and Ride if customers believe they could drive to their destination in less time than it will take for the next bus to arrive.

A minimum standard of a bus every 15 minutes is required to meet the definition of Frequent Service, which is generally considered to be where customers are comfortable to 'turn up and go'. At this frequency, the average waiting time then becomes 7.5 minutes if customers are arriving randomly and without needing to plan their departure according to service timetables.

Bus services must also have adequate spare capacity to enable customers to board and/or to prevent buses from becoming overloaded closer to the CBD.

Although bus services can be increased to provide additional capacity and frequency, the cost of doing so can be substantial. Locations with adequate existing bus service provision should be prioritised over those that require improvement or investment in new services. Alternatively, in some instances larger buses can be used to increase capacity, although this also requires additional capital investment.

Table 2: Scoring for Bus Service Provision criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Poor bus provision, requiring major improvements to serve site. Less than 4 buses per hour in AM peak.	Some improvements needed, but could occur over time. 4 to 7 buses per hour in AM peak.	Very good bus provision or planned improvements are suitable. 8 or more buses per hour in AM peak inbound. 2 or more buses per hour in off-peak per direction.

Proximity of Site to Existing Bus Services

Park and Rides should ideally be located on existing bus routes to avoid the need for services to be diverted to them. The diversion of services typically results in increased route lengths and slower journey times for other customers.

A Park and Ride location should preferably be adjacent existing bus stop, however it is noted that installing new bus stops is typically low-cost and low impact.

Table 3: Scoring for Site Proximity to Bus Services criterion

Poor	Acceptable	Good
🔴	🟡	🟢
New bus routes required, or significant diversion required with potentially high impact on length of trip.	Minor diversion not likely to significantly affect trip length.	No diversion required.

Travel Time Competitiveness

To be attractive to customers, bus services need to provide travel times to the Hobart CBD that are competitive with driving.

This criterion is assessed by comparing travel times estimated by Google Maps to reach the Hobart CBD, e.g. intersection of Elizabeth Street and Macquarie Street. For driving, the midpoint of the range of Google's estimated travel times is used. For buses, the fastest available bus journey in the AM peak hour is used.

Table 4: Scoring for Travel Time Competitiveness criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Not competitive with direct car journey to CBD. More than 25% slower than driving in AM peak. Limited opportunity to implement faster bus services.	Somewhat competitive with private vehicle trip to CBD. 10%-25% slower than driving in AM peak, and/or potential to implement new direct bus services.	Trip is competitive with direct private vehicle trip to CBD (better than 10% slower than driving in AM peak).

Site Visibility and Accessibility

This criterion relates to the degree to which a site is visible to and accessible by citybound traffic.

Site visibility is important as a passive means of advertising the presence of the Park and Ride. Sites with greater visibility to motorists are more likely to attract them to use it.

Site accessibility relates to the ease by which motorists can access the site from the surrounding road network. Accessibility in the inbound direction is a higher priority than the outbound direction.

Table 5: Scoring for Site Visibility and Accessibility criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Site is not in a location that is easily visible and/or accessible by catchment	Site is in a suitable location subject to some improvements such as road links and visibility	Site is suitably located to serve catchment, with good visibility and accessibility for citybound traffic

Local Traffic Impact

Park and Rides are generators of traffic, which may result in increased noise and localised traffic congestion. Because of this, the potential location of the Park and Ride may be incompatible with adjacent land uses and not appropriate in some areas such as town centres, residential streets, or near sensitive land uses such as schools.

Table 6: Scoring for Local Traffic Impact criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Site is likely to attract traffic into congested, sensitive or town centre locations.	Traffic impacts generated by site are likely to be minor and/or can be mitigated.	Site is unlikely to attract traffic into congested, sensitive or town centre locations.

Pedestrian and Road Safety

Vehicles need to be able to safely access a Park and Ride from the surrounding road network. Most road safety issues relate to the site entrance, particularly where car turning movements create conflicts with other traffic. The speed environment of the approaching roads is also a factor as access to and from higher speed roads creates increased risk.

Pedestrian safety mainly relates to the ability of Park and Ride customers to move between their parking space and the bus stops. Most Park and Ride sites require customers to cross the road in at least one direction of travel, and the ability to provide a safe crossing environment is paramount.

Table 7: Scoring for Pedestrian and Road Safety criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Road safety issues exist for car access, and/or pedestrians accessing bus stops that cannot be readily addressed.	Road safety issues exist for car access, and/or pedestrians accessing bus stops, but these can be addressed through design.	Site can be accessed safely by cars, and pedestrians can access bus stops safely.

Bicycle Integration

Bicycle integration mostly relates to the ability of cyclists to access the site from the surrounding area in a direct and safe manner. Park and Ride facilities located close to quality cycle networks are likely to be more attractive to cyclists.

The ability to provide bicycle storage facilities must also be considered. Sites with good passive surveillance are preferred, along with sites with adequate space to provide secure bike cages.

Table 8: Scoring for Bicycle Integration criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Site cannot be accessed safely by cyclists, and/or site unsuitable for secure cycle facilities.	Site is suitable for secure cycle facilities, but improvements are needed to the external road network for safe cycle access to site.	Site is suitable for secure cycle facilities, and the external road network is for safe cyclists.

A.2.2 Planning Criteria

Planning Designation

This criterion relates to the Tasmanian Interim Planning Scheme, and the compatibility of the zoning of the site with the intended land use of a Park and Ride facility.

Table 9: Scoring for Planning Designation criterion

Unacceptable	Poor	Acceptable	Good
⚫	🔴	🟡	🟢
Zoning not suitable, with significant conflict and no potential to re-zone.	Zoning not suitable, or significant planning constraints and conflicts with re-zoning required.	Zoning not suitable, re-zoning required, but no other major constraints noted	Zoning is suitable for Park and Ride

Environmental and Heritage Constraints

Constraints relating to environmental factors or heritage issues. Where constraints can be managed or mitigated, the cost or complexity of doing so needs to be considered.

Table 10: Scoring for Environmental and Heritage Constraints criterion

Unacceptable	Poor	Acceptable	Good
⚫	🔴	🟡	🟢
Environmental or heritage constraints render site unworkable.	Significant impact on environment or heritage. Mitigation is extremely difficult or costly.	Impact on environment or heritage, but can be mitigated through design.	Environment or heritage impacts not identified or are easy to mitigate.

Community Support

The degree to which community support or resistance is likely. Previous community feedback on the selected site or other developments in the local area may be suitable to assess the criterion without direct engagement.

Table 11: Scoring for Community Support criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Previous community resistance, or likely resistance	Some indication of community support, or low likelihood of resistance	Community support has previously been identified

Impact on Surrounding Land Uses (acoustic, visual, pollution)

The likelihood of a Park and Ride affecting adjacent land uses through acoustic, visual or pollution impacts.

Table 12: Scoring for Impact on Surrounding Land Uses criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Impacts identified and limited opportunities to mitigate	Impacts identified and but opportunities to mitigate exist	Impacts not identified or are easy to mitigate

Parking Overflow, Risk, Management and Mitigation

If a Park and Ride reaches capacity, customers unable to find a parking space are likely to park in surrounding streets, either legally or illegally. Opportunities to accommodate excess demand through future site expansion can be considered, along with the ability to implement effective management mitigation strategies (i.e. parking enforcement).

Table 13: Scoring for Parking Overflow criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Excess demand could not be easily accommodated and/or would create local impacts	Excess demand could be accommodated but may be costly to do so	Excess demand could be accommodated at acceptable cost

A.2.3 Cost and Constructability Criteria

Site Ownership

Existing site ownership can be a significant determinant of the feasibility of establishing a new Park and Ride. Sites under public ownership, such as land within the road reserve, are typically easier to develop. Sites under private ownership may be able to be acquired but forced or negotiated acquisition can be costly and difficult.

Table 14: Scoring for Site Ownership criterion

Unacceptable	Poor	Acceptable	Good
⚫	🔴	🟡	🟢
No possibility of acquiring site.	Private ownership with land acquisition required.	Private ownership with land acquisition required, but land acquisition unlikely to be problematic	Public land and landowner is supportive of use.

Other Significant Constraints

Any other significant constraints that would need to be mitigated or overcome through design, including interventions outside the site itself such as drainage or road network improvements.

Table 15: Scoring for Other Constraints criterion

Poor	Acceptable	Good
🔴	🟡	🟢
Major constraints likely to add significant costs to site development.	No major constraints, or constraints can be addressed without significant cost impact.	No constraints, or constraints can be easily addressed.

APPENDIX B Design Standards

Legislation	
Commonwealth	Disability Discrimination Act 1992 (DDA)
State	
Disability Standards and Guidelines	
Standards and Supplementary Material	Disability Standards for Accessible Public Transport 2002 (Cth) (Transport Standards) Disability Standards for Accessible Public Transport Guidelines 2004 (No. 3) Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards)
Guidelines	Australian Human Rights Commission. (2010) Accessible bus stop guidelines https://www.humanrights.gov.au/australian-human-rights-commission- accessible-bus-stops-guidelines Australian Human Rights Commission (2013) Guidelines on the application of the Premises Standards, Version 2 https://www.humanrights.gov.au/guidelines- application-premises-standards
Australian Standards	
Access and Mobility	AS 1428.1-2009 - Design for access and mobility - General requirements for access - New building work AS 1428.1-2009/Amdt 1-2010 - Design for access and mobility - General requirements for access - New building work AS 1428.1-2001 (superseded) - Design for access and mobility - General requirements for access - New building work * AS 1428.2-1992 (R2015) - Design for access and mobility - Enhanced and additional requirements - Buildings and facilities * AS 1428.4-1992 (superseded) - Design for access and mobility - Tactile ground surface indicators for the orientation of people with vision impairment * AS/NZS 1428.4:2002 (superseded) - Design for access and mobility - Tactile indicator AS/NZS 1428.4.1:2009 - Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators AS/NZS 1428.4.1:2009/Amdt 1:2010 - Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators AS/NZS 1428.4.1:2009/Amdt 2:2014 - Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators AS 1735.12-1999 - Lifts, escalators and moving walks - Facilities for persons with disabilities * AS/NZS 3856.1:1998 - Hoists and ramps for people with disabilities - Vehicle- mounted - Product requirements
Parking	AS 2890.3-1993—Parking Facilities—Bicycle parking facilities AS/NZS 2890.1-2004—Parking facilities—Off-street car parking AS 2890.5 – 1993 —Parking facilities—On-street parking AS/NZS 2890.6:2009 - Parking facilities - Off-street parking for people with disabilities
Signage and Traffic Control Devices	AS 1742.10—Manual of uniform traffic control devices—Pedestrian control and protection, 2009 AS 1742.11—Manual of uniform traffic control devices—Parking controls, 1999
Access and Safety	AS/NZS 3661.2-1994—Slip resistance of pedestrian surfaces—Guide to the reduction of slip hazards AS 4586-2013—Slip resistance classification of new pedestrian surface materials AS 4663-2013—Slip resistance measurement of existing pedestrian surfaces

Lighting	AS/NZS 1158.3.1:2005 - Lighting for roads and public spaces - Pedestrian area (Category P) lighting - Performance and design requirements AS/NZS 1158.4:2015 - Lighting for roads and public spaces - Lighting of pedestrian crossings AS/NZS 1680.2.1:2008 - Interior and workplace lighting - Specific applications - Circulation spaces and other general areas
National Standards	
	National Construction Code of Australia (NCC) Building Code of Australia Class 2 to Class 9 Buildings (NCC Volume 1) Contains the regulations for commercial buildings Building Code of Australia Class 1 and Class 10 Buildings (NCC Volume 2) Contains the regulations for residential buildings
Australian Design Rules (ADR)	Vehicle Standard (Australian Design Rule 58/00 – Requirements for Omnibuses Designed for Hire and Reward) 2006
Austroads	Austroads. (2010). Guide to Road Design, Part 3—Geometric Design (Publication No: AGRD03-10). Sydney: Austroads Ltd. Austroads (2009) Guide to Road Design Part 4 – Intersections and Crossings – General (Publication AGRD04/09). Sydney Austroads Incorporated. Austroads (2010) Guide to Road Design Part 4A– Unsignalised and Signalised Intersections (Publication AGRD04A/10). Sydney Austroads Incorporated. Austroads (2009) Guide to Road Design Part 6A– Pedestrian and Cyclist Paths (Publication AGRD06A/09). Sydney Austroads Incorporated Austroads (2008) Guide to Traffic Management, Part 11—Parking, Publication No. AGTM11/08 Sydney, Austroads Incorporated. Austroads (2014) Cycling Aspects of Austroads Guides (Publication No AP-G88- 14). Sydney: Austroads Incorporated. Austroads. (2001). Forecasting Demand for Bicycle Facilities (Publication No. AP- R194/01). Sydney: Austroads Incorporated. Austroads. (2006). Pedestrian–Cyclist Conflict Minimisation on Shared Paths and Footpaths, Publication No. AP-R287/06, Sydney, Austroads Incorporated.

APPENDIX C Case Studies

In most cities, Park and Ride is provided as part of a rail-based public transport system. To ensure relevance to Greater Hobart the case studies reviewed in this document look specifically at cities where Park and Ride provision is part of a bus-based, or bus-dominated public transport system. These case studies aim to provide an overview of relevant lessons and observations to inform best practice in strategically planning Park and Rides in Greater Hobart.

Auckland, New Zealand – Northern Busway

The Northern Busway in Auckland officially started operating in 2008, with additional express services added to Hibiscus Coast station, at the end of the busway, in 2015. Park and Rides are located at Albany Station and Hibiscus Coast Station, the two furthest of the six stations on the busway. They were constructed to support the implementation of the BRT system, to encourage ridership, and to extend the reach of the network into greenfield growth areas.

Albany station is located adjacent to the motorway interchange and the Albany town centre. At the time of construction there was little to no development in and around the bus station. There are now 1,100 parking spaces, pick up and drop off zones, CCTV, security staff, 40 bike racks and self-service lockers, mobility and dedicated carpool spaces, and covered walkways providing access to the bus station.

The Albany Park and Ride has doubled in size since it was first constructed. Parking is provided for free on a first come first served basis. This has created some difficulties in managing the demand for parking at this site as it has proven very popular. Auckland Council has recently introduced on-street parking charges in the surrounding area to help manage spill-over parking in this area. A network redesign has also introduced new feeder services to try and decrease demand for Park and Ride at this site. A private parking operator is now providing priced parking, costing between $3 and $5 for 12 hours, at a site adjacent to the Council provided Park and Ride. This parking lot is also very well utilised by commuters.

Further north at the end of the busway, the Hibiscus Coast station Park and Ride does not currently provide the same level of facilities as Albany. However, this site has also proven popular and high demand for spaces, associated spill-over parking, as well as a local bus network redesign has led to a two-stage upgrade of the facility which is currently underway and due for completion in late 2019. This Park and Ride located near the motorway interchange, was initially a simple sealed and line-marked 100 space car park with lighting, but no CCTV or security. It currently has about 484 spaces, with stage two of upgrade adding around 127 extra spaces. Other facilities added include walkway canopies, an off-street bus station with toilets, ticketing and other customer facilities, pick up and drop off zones and a stormwater retention pond.[6] An agreement with the Hibiscus and Bays Local Council Board has allowed the provision of temporary additional parking on sports club land while construction of upgrades are underway.

[6] Auckland Transport, 2019 *Hibiscus Coast busway Station,* Auckland Transport retrieved 16 June 2019, <https://at.govt.nz/projects-roadworks/hibiscus-coast-busway-station/>.

Figure 3: Artist impression of the Hibiscus Coast busway station and Park and Ride[7]

Observations

The Northern Busway Park and Rides have been highly successful in reducing congestion on the Northern motorway and attracting new public transport users[8]. This is also supported by the competitive speed of the busway trip, the quality of the buses and supporting infrastructure, such as stations, and the comparative cost and availability of parking in Auckland CBD.

Neither of the Park and Rides were designed with boom gates or any means managing access to the sites. Given the popularity of the Park and Rides this makes it difficult for Auckland Transport to introduce ways of managing the facility.

There is no land available for expansion at the Albany site, as surrounding sites have been earmarked expansion of the town centre. This has led to pressure to construct a costly multi-storey parking building increase the capacity of the Park and Ride.

However, as is demonstrated by the adjacent privately-operated site, there is some acceptance for paying for parking. Suggesting that despite reported opposition, pricing may be a viable solution for managing demand at the Albany Park and Ride. It could also suggest a need to investigate further investment in feeder services or additional express public transport services from areas of demand to reduce pressure on the Albany and Hibiscus Coast Park and Rides.

This case study also demonstrates how agreements can be made with other landholders, in this case the Council, to provide additional spaces where needed either temporarily or on an on-going basis.

[7] Auckland Transport, 2019.

[8] Transport Futures, 2012, *Northern busway review report*, NZTA, Auckland.

Oxford, United Kingdom

Park and Rides have been utilised in Oxford since the mid-1970s and were implemented as part of a broader policy direction aiming to reduce traffic in the historic city centre[9]. There are five Park and Ride facilities with around 5,000 spaces located on the ring road around Oxford, each with dedicated frequency all-day bus services to and from the CBD. The Oxford Parkway Park and Ride is also integrated with station access to the national rail network. Adding to the attractiveness of Park and Ride in Oxford is the competitiveness of access to the CBD via bus from the Park and Ride. From some locations the journey is faster or equivalent to a peak private vehicle trip to the CBD. Parking in the CBD is also limited and priced. Parking charges also apply for use of the Park and Rides, yet despite this the Park and Rides have proven very popular. The popularity of these Park and Rides have added to noticeable localised congestion, including Ring Road congestion. Given the congestion and the reach of growth beyond the existing Park and Ride locations it has been observed that existing locations are now to close to the CBD (some are within 3-5 kilometres of the CBD). This combined with housing and job growth in county has led Oxfordshire Council to start investigations into doubling the number of Park and Ride spaces over the next twenty years at some existing sites, but primarily closer to users' trip origin.[10]

Observations

Oxfordshire have used pricing as way of managing demand, before investing in additional capacity. This allows for a greater understanding of demand and capacity requirements for Park and Rides. It also assists in recovering the ongoing costs of providing Park and Ride and associated direct services.

Dedicated frequent bus services designed with bus priority, help to ensure reliability for customers. This approach has also proven to be beneficial to the bus operators as well, as demand for these services makes them more commercially viable.

This case study highlights the need to strategically select Park and Ride sites. Especially with consideration of likely demand and long-term growth in the area surrounding a site. It also highlights the importance of selecting a site far from the CBD, and as close to the origin of the trip as possible.

[9] Mill, G & White, P, 2018, 'Evaluating the long-term impacts of bus-based Park and Ride', *Transportation Economics*, vol. 68, pp. 536-543.
[10] Atkins, 2016, *Oxford Park and Ride strategy*, Oxfordshire County Council, Oxford, retrieved 11 June 2019, <https://www2.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/roadsandtransport/transportpoliciesandplans/areatransportstrategies/oxford/OxfordParkRide-MainReportForTasks1-4_V2_0withAppendices.pdf>.

Greater Seattle, Washington State, USA

The Seattle area's public transport system has grown with significant reliance on Park and Rides to attract new public transport users. There are around 248 sites across the Greater Seattle area mainly managed by local transit authorities and some managed by Washington State Department of Transport (WSDOT).

Managing capacity and demand is an on-going issue with about twenty percent of facilities now at or beyond capacity,[11] while others are very under-utilised. With many of the major Park and Rides at capacity or nearing capacity, combined with a limited appetite for pricing, and a desire not to overcapitalise on investment in Park and Ride, WSDOT and local transit authorities are investigating alternative approaches to providing Park and Ride and managing the demand.

WSDOT has a history of leasing carparks from churches and community centres to share parking spaces to increase the number of sites and spaces across Greater Seattle.[12] WSDOT is also working with developers to include Park and Rides as part of new developments[13].

Observations

This approach of leasing sites makes use of existing parking that is usually only utilised in the weekends or evenings. Churches are also often located on main roads, at intersections or on the edge of town centres meaning they have good access and visibility for users. Using existing parking facilities with different demand-patterns is an efficient and low-cost way to increase capacity of Park and Rides. A network of smaller sites is also a good alternative to requiring customers to drive further to one larger facility.

However, access and use of a leased site does not offer the same security of tenure as a government owned site. Therefore, use of these sites is best in situations where temporary Park and Ride is required, as supplementary capacity or as a transitional approach.

This case study also highlights the risks with relying on Park and Ride to increase public transport ridership without any tools for managing demand in growth over time such as pricing or restricted access. Some of the local transit authorities in the Greater Seattle area are now trialling permits and preferential parking, but pricing remains difficult to implement.

[11] WSDOT, 2018, *Park and Ride utilization map*, WSDOT, retrieved 11 June 2019, <https://www.wsdot.wa.gov/Choices/parkride.htm>.
[12] National Academies of Sciences, Engineering, and Medicine, TCRP, 2017, Decision-making toolbox to plan and manage park-and-ride facilities for public transportation: Research report and transit agency case studies, The National Academies Press, Washington, DC.
[13] WSDOT, 2019, Park and Ride questions, WSDOT, retrieved 11 June 2019, <https://www.wsdot.wa.gov/Choices/parkrideinfo.htm>.