Guidelines for the Development of Public Transport Interchange Facilities
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Introduction

Background

The preparation of the *Guidelines for the Development of Public Transport Interchange Facilities* reflects the growing importance of public transport patronage in our urban areas and recognition that the standard of interchange facilities significantly influences people’s travel decisions.

The Auditor General’s report *Connecting with Public Transport*, (June 2007) made a number of recommendations about the management and performance of public transport interchanges. In terms of interchange design and performance, the report recommended:

- the development and issue of best practice guidelines for different categories of interchanges;
- a review against the best practice guidelines to assess the quality of the present interchange arrangements; and
- partnership with local stakeholders to identify ways of ensuring good quality multi-modal interchanges, particularly those where quality falls short of the guidelines.

These Guidelines have been developed in response to the Auditor General’s report and provide the foundation for the development of transport interchange facilities that will meet the Government’s transport objectives.
Interchange Development

The NSW Government first instigated an interchange improvement program in 1988 and its investment in the program has been consistent since that time. The construction of the major interchange facilities at Blacktown, Liverpool and Bondi Junction set new standards of interchange functionality. Since then the Parramatta Transport Interchange has achieved further innovation in terms of improving the passenger experience and facilitating Transit Oriented Development in the heart of Sydney's second CBD.

Transport interchanges are planned and developed through a number of programs, including:

• Local Government Master Planning processes;
• Ministry of Transport's Interchange Development Program;
• RailCorp's Easy Access and station upgrade program;
• Major rail infrastructure programs such as those delivered by Transport Infrastructure Development Corporation (TIDC); and
• Department of Planning / Landcom / Growth Centres Commission through major land release developments, such as the north-west and south-west sectors (eg Leppington and Rouse Hill).

The Ministry of Transport's interchange program is generally funded through the Parking Space Levy. RailCorp and TIDC interchanges are usually funded though capital works programs. Local Government and the Department of Planning also fund interchange development through voluntary planning agreements, development levies and Section 94 contributions.

In August 2007 the Minister for Transport announced that scoping studies would be undertaken on 25 transport interchanges on rail and bus corridors throughout Metropolitan Sydney. This built on the Government's 2007 Actions Stations commitment to upgrade 67 CityRail stations, 4 transport interchanges and conduct a further 5 scoping studies on transport interchanges in metropolitan and outer metropolitan regions.

The scoping studies analyse existing and future interchange functions and passenger flows and develop concept designs for future upgrades through the interchange development program.
Purpose and Application of Guidelines

The Guidelines for the Development of Public Transport Interchange Facilities provide the foundation for the development of transport interchange facilities that will meet the Government’s transport objectives.

They are not intended to provide detailed direction regarding construction standards for interchanges, rather they focus on the planning and design of the various elements that make an effective transport interchange. They also provide a reference framework for assessing the adequacy of existing facilities.

This document is provided as a guideline only. It is the role of planners and designers to undertake the necessary investigations to assess the requirement for each individual interchange and tailor solutions to meet site specific needs, taking into account each site’s transport system and urban context. These guidelines should be read in conjunction with relevant guidelines developed by other agencies (see Appendix A).

The Ministry of Transport recognises that this is an evolutionary document which will be reviewed and amended where appropriate to reflect changes in practice and lessons learned.
Planning Framework

Interchanges are a critical component of Sydney’s public transport network. The sprawling nature of Sydney’s urban environment means that travel flexibility is critical and can be expected to remain a feature of Sydney’s public transport needs in the future. The Metropolitan Strategy (2005), State Plan (2006) and the Premier’s Urban Transport Statement (Nov 2006) address these issues, with the latter describing the transport challenges facing Sydney in the following terms:

- the diversity and complexity of travel needs;
- forecast population growth of more than 1 million over the next 25 years in new and existing areas;
- current and increasing road and rail congestion in both peak and traditionally non-peak periods that are affecting cars as well as train and bus services’ capacity to meet travel needs; and
- the need to accommodate forecast growth in passenger, private vehicle and freight movements in already highly constrained road and rail systems.

The Illawarra, Lower Hunter and Central Coast Regional Strategies integrate land use and transport planning to connect housing, employment and services. Transport interchanges play a key role in the development of the regions and their transport networks.

Meeting these challenges will be contingent on the successful implementation of a scheme to ensure that points where services interconnect provide people with a convenient transfer between modes. The effective planning and development of these interchange points are key elements in achieving the growth of public transport patronage outlined in the State Plan.

The development of effective public transport interchanges complements other NSW Government planning polices that promote public transport use. These include the Government’s Integrated Land Use and Transport Policy package (2001), the Premier’s “Why Active Living Statement” (2007) and the Premier’s Council for Active Living, which aims to build and strengthen the physical and social environments in which communities engage in active living. The Statement promotes attractive public transport options to promote active living and help prevent reliance on the car.
Interchange Categories and Characteristics

Interchange Categories

Public transport interchanges generally fall into one of the following five categories:

- global / regional interchanges;
- major / specialised interchanges;
- multi-access interchanges;
- local interchanges; and
- strategic bus corridor interchanges.

The following criteria can be used to determine the category into which individual interchanges best fit, noting some variation / flexibility between categories will inevitably occur across regions:

- Government land use and transport policy;
- adjacent activity, town centre or commercial activities and planned future land use;
- degree of transport service activity by modes;
- frequency of major services (rail or bus);
- number of bus services and bus stands provided;
- level of multi-modal transfer; and
- passenger movements and forecasts.
Interchange Characteristics

Global / Regional Interchanges

Global / regional interchanges are located in Global Sydney and Regional Cities identified in the Metropolitan Strategy and are characterised by:

- very high frequency rail services;
- high passenger volumes;
- major origin and destination points for trips;
- high proportions of passengers transferring between modes;
- being a focal point of an extensive strategic bus corridor network and local bus network;
- being well serviced by taxis;
- having pedestrian/cycle access integrated with surrounding development; and
- being located in town centres with high level of housing and employment, with regional and commercial retail facilities.

Commuter car parking is generally not provided because primary access is by extensive public transport, walking and cycling. Commuter car parking may be considered where consistent with the Government’s Draft Metropolitan Parking Policy.

Global interchanges include all major interchanges within the CBD and North Sydney and regional cities such as Gosford and Parramatta.
Major / Specialised Interchanges

Major / Specialised interchanges are located in Major Centres or Specialised Centres identified in the Metropolitan Strategy. Major centres are characterised by:

- high frequency rail services;
- being the focal point of an extensive strategic bus corridor network;
- being well serviced by taxi services;
- having pedestrian/cycle access integrated with surrounding development; and
- being located in centres with significant employment, with commercial or retail facilities and large residential populations.

Commuter car parking is generally not provided because primary access is by extensive public transport, walking and cycling. Commuter car parking may be considered where consistent with the Government’s Draft Metropolitan Parking Policy.

Major centres include Bankstown, Blacktown, Hurstville, Dee Why / Brookvale and planned major centres such as Rouse Hill, Leppington and Green Square. Specialised Centres include Norwest Business Park, Olympic Park and Westmead.

Multi-access Interchanges

Multi-access interchanges are located in local sub-regional and district centres identified in the Metropolitan Strategy. Multi-access interchanges are characterised by:

- having adequate rail access;
- being the point of interception between a bus route service and a ferry wharf;
- being a focal point of strategic and local bus routes which primarily serve the surrounding residential area;
- having large numbers of walkers/cyclists from surrounding suburbs and from residential areas within the centre;
- often being located in local neighbourhood centres such as towns and villages; and
- having limited taxi services.

On street commuter car parking in surrounding streets or in designated commuter car parks may be considered where consistent with the Government’s Draft Metropolitan Parking Policy.

Examples of multi-access interchanges include Gordon, St Marys, Riverwood and Manly.
Local Interchanges

This category includes the majority of RailCorp stations which perform a local interchange function and are characterised by:

- having walking and kiss and ride as the dominant access mode;
- serving a local community;
- having limited bus services or taxi stands; and
- access by cyclists.

On street commuter car parking in surrounding streets or in designated commuter car parks may be considered where consistent with the Government’s Draft Metropolitan Parking Policy.

Examples of local interchanges include Waverton, Normanhurst, Canley Vale, Mortdale and Casula.

Strategic Bus Corridors

The Ministry of Transport and the Roads and Traffic Authority (RTA) are currently planning and implementing the Government’s 43 strategic bus corridors throughout the Sydney metropolitan area.

The strategic bus corridor category of interchange has been established to facilitate the planning and establishment of a bus network which integrates with other transport modes and links residential communities, regional centres, hospitals and education facilities. Major government programs and Subregional strategies are focussing on these corridors and major bus interchanges located along the corridors.

A major strategic bus corridor interchange is characterised by:

- having walking/cycling and buses as the dominant access mode;
- high frequency bus services operating along a strategic bus corridor;
- serving the local community through local bus routes feeding onto the corridors;
- a degree of interchange between local and high frequency bus routes; and
- connection of local activity centres such as hospitals, schools and shopping centres via cross-regional bus services.

Examples of major strategic bus corridor interchanges includes, Brookvale / Dee Why, Bondi Junction, Lane Cove and Baulkham Hills.
Planning for Effective Interchange Facilities

Planning

The primary services an interchange provides include:
- passenger access to the public transport network and inter-modal transfers;
- access point or gateway to the town centre and community;
- sheltered public waiting areas;
- passenger information to assist travel decision-making; and
- a focus for activity and catalyst for increased economic development in the area.

One of the key objectives for interchange design is the integration of public transport interchanges with local town centres. Integration allows decisions about local land use to lend support to and gain benefit from increased accessibility provided by improvements to public transport. Major investment in interchange facilities should be harnessed to achieve multiple secondary benefits which provide useful additional services to passengers such as cafes, newsagents, ATMs and groceries. Interchange facilities, particularly Global/Regional and Major Interchanges, should not simply be buildings for people to wait in.

Public transport interchanges need a clear image and identity so that arriving passengers get a sense of having arrived at a specific place and can easily access available transport modes. Local identity can be expressed through architectural design and community space, public artworks and natural landscaping. Allocating public space or town squares as a pedestrian zone around stations or interchanges sometimes assists in creating activity nodes and integrating the centre with public transport infrastructure.

Local Government can play a role in improving the public domain surrounding the interchange by offering development incentives or reserving land through zoning controls. Opportunities to accommodate additional uses in the interchange should be considered as part of the site analysis. Ideally the design should permit appropriate flexibility for future land uses and/or commercial opportunities.

Planning for a new or upgraded interchange requires close consultation with a number of agencies including, but not limited to:
- bus operators;
- ferry operators;
- taxi operators;
Planning (continued...) 3.1

- long distance coach operators;
- local council;
- RailCorp;
- TIDC;
- RTA;
- Ministry of Transport;
- Department of Planning;
- Police; and
- landowners.

The following groups should also be consulted through the planning process:
- existing users;
- user groups;
- disability groups; and
- the local business community.

Principles of Interchange Design and Function 3.2

The following principles guide interchange design and function and form the basis for the development of safe, comfortable and efficient multi purpose interchange facilities.

Modal Priority Access 3.2.1

Noting that circumstances may vary due to site specific issues and constraints, the most prominent location should be given to the most efficient and sustainable modes of travel. For example, pedestrians and cyclists should have the most direct access to the interchange, while commuter parking (park and ride), which, based on the cost of provision and the space it consumes, should be given the lowest priority allocation of space and location.

Generally, the preferred order of priority in interchange development is:
- pedestrian / bicycle;
- bus / ferry;
- taxi;
- kiss and ride (drop off and pick up); and
- park and ride (commuter parking).
Separation of Travel Modes

Separation between the key modes of pedestrians, cyclists, buses, taxis and cars improves safety and efficiency. Segregating different vehicle types within an interchange can also help reduce potential conflicts. Designated entrances and exits to the station and road network, particularly for buses, are desirable.

Design models that segregate pedestrian and vehicle movements and feature clearly marked crossing points that give pedestrians priority are recommended to minimise conflict. Separating flows of arriving and departing passengers will maximise the efficiency of pedestrian spaces. Effective management of significant pedestrian flows can be achieved with signalised crossing of roads or grade separation where appropriate.

Modal Integration – Ease of Transfer

There is clear evidence that time spent waiting and transferring are the main reasons public transport customers are averse to moving between modes. All aspects of an interchange, including connection spaces and waiting areas, must be carefully planned to improve passenger comfort in order to retain, enhance and support current and future patronage.

They must also be improved to meet the access requirements for people with disabilities as set out in the Disability Discrimination Act and Disability Standards for Accessible Public Transport (see section 3.4.3).
Transit Oriented Development Outcomes

Public transport facilities should integrate with surrounding activity centres and circulation networks. The design of development within the primary catchment of interchanges (between 400 metres and 1km) should support the principles of Transit Orientated Development (TOD) and maximise opportunities to encourage access to public transport.

Consolidation around transport interchanges generally includes commercial or residential developments which increase employment or residential densities within the primary catchment area. Close proximity of these developments will provide the interchange with the added benefit of passive surveillance.

Strategies that can be implemented to encourage TOD around interchanges include:
- mixing commercial, retail, or residential density in the primary catchment of the interchange to take advantage of increased accessibility and support a high level of public transport usage;
- improving pedestrian and cycle access to adjoining land uses; and
- reducing the need for on-site parking in residential and commercial developments within the interchange precinct with incentives to incorporate the provision of well lit, all-weather access routes in the development.

Legibility

Legibility is particularly important at interchange facilities where there is growth or there is an expected increase in new or first-time users. A legible interchange has common destination and pick up points, clear and uncomplicated transfer paths and way-finding and information signage.
Interchange User Requirements

Critical issues for users of a public transport interchange include:
- actual and perceived security and safety;
- punctual services;
- well maintained and clean interchange facilities;
- a pleasant and comfortable environment;
- clear service and timetable information; and
- way-finding and directional signage.

Changing between transport modes requires:
- clear lines of sight and movement;
- ease of transfer between modes, including lifts and ramps for less able passengers;
- clear way-finding signage; and
- clear and consistent information about services (real time where possible).

The major interchange elements should be as close as practicable to each other to minimise walking distance and maximise efficiency of modal transfer.

Planning for Transport Modes

Rail

Interchange upgrade programs are often with rail station upgrades and therefore a cohesive approach is required for station precinct development. Key issues to be addressed in order to meet forecast patronage growth include:
- getting more passengers efficiently to stations located in constrained / congested areas;
- diversity of station access modes, recognising balanced investment is needed to meet rail patronage growth and access capacity to stations;
- recognition that passenger growth will be derived from locations beyond the walk in capture area in order to achieve growth targets;
- development of strategies to increase the capacity of station access modes; and
- development of strategies to accommodate station access patronage growth outside the commuter peaks.
Pedestrians (walking)

Walking is considered both an access mode to an interchange and a component of a total journey. Higher order interchanges, such as railway and transitway stations, have a more extensive walking catchment because they offer high frequency services. These catchments, which can be up to a 1 km radius from the interchange, should have effective way-finding signage, lighting, and surveillance from adjacent streets or land uses as well as safe pavements with kerb crossings suitable for less able persons.

The actual pedestrian walk times need to be checked against the theoretical walking times and take into account physical and topographical conditions. This will highlight any physical barriers to access that can be overcome by additional links. Pedestrian access plans for the catchment areas should be developed in conjunction with local Government during the planning and development of transport interchanges, to ensure pedestrian access is addressed in the process.

Planning for pedestrians within the interchange itself should incorporate the following principles:

- separation between passengers and vehicles and, where possible, separation of arriving and departing passengers to minimise interference;
- clearly defined public access routes; and
- focussed pedestrian movements to defined crossing points to minimise pedestrian and vehicle conflict.

This can be achieved by:

- using bollards, landscaping, or kerbing;
- planting and paving patterns that reinforce pedestrian circulation routes;
- safe and attractive pedestrian access provided by widened footpaths, increased lighting, provision of shade and shelter;
- designing direct and unobstructed routes / travel paths; and
- configuring the layout to favour the highest volume of users.

The design for pedestrian elements within an interchange should consider future patronage growth and transport service growth over a 30 year ramp-up period, using growth forecasts for population and employment as a guide. These forecasts will affect all aspects of the interchange including:

- passenger waiting areas;
- pedestrian movement corridors;
- stairs, escalators and other forms of vertical movement; and
- ticketing facilities.

The critical period for forecasting future patronage is the morning commuter peak (6.30am to 9.30am). Pedestrian flow rates should be based on the levels of service as defined by urban analyst JJ Fruin (Pedestrian Planning and Design by JJ Fruin - 1987).
Pedestrians (walking)  

Pedestrian elements along pedestrian flow paths should satisfy at least a pedestrian level-of-service C for the forecast peak period.

Congestion on pathways and in waiting areas can significantly increase transfer and waiting times. Minimising queuing of passengers helps to maintain visibility towards barriers and to maintain smooth operation during peak periods. The design process needs to consider and nominate pedestrian flow with target persons per hour based on future patronage forecast years.

Passenger lifts are recommended where platform access (bus or train) is grade separated. The lift should be large enough to accommodate a stretcher bed and comply with AS1735.12 requirements. Transparent panels are recommended as they allow occupant visibility.

Escalators are recommended where passenger loads reach 6,000 persons per hour. The design and location of escalators should be based on peak flow rates. Generally escalators should be able to reverse direction to match peak flows. Alternative access (adjacent stairs) is required to allow for maintenance or shutdowns.

Cycling

The implementation of local bicycle plans and regional cycle networks will increase the number of passengers arriving at interchanges by bicycle. Cycle access plans for the catchment areas should be developed in conjunction with local government during the planning and development of transport interchanges to ensure cycle access is addressed. To address and accommodate cycling to and from an interchange the following measures are recommended for inclusion:

- safe and direct cycle access path where site layout allows; and
- secure bicycle storage, such as bike lockers and/or bike racks.
Buses are given highest priority in the allocation and location of kerb space within the interchange. The public transport service catchment for any interchange is determined by the catchment area of each of the individual services that utilise the interchange. Bus routes service a broad and flexible catchment area, varying services and routes for schools and work day morning and evening peaks.

Bus movement paths should be designed to minimise delays because small increases to journey time have significant aggregate effects on operating schedules and costs. Traffic control measures should give priority to bus movements approaching and within the interchange.

The layout of bus stops’ turning circles and layovers must satisfy the requirements of the “design bus”. Selection of the design bus for each interchange should involve consultation with all local operators and provide a degree of flexibility for future changes. As a starting point, the layout of bus stops’ turning circles and layovers should satisfy the requirements of 14.5m long rigid buses, 18m long articulated buses and 4.4m high double deck buses. Long distance coaches will have operator-specific requirements.

The layout and design of the bus stands should be focused on best passenger outcome in relation to walking distance, convenience and legibility. Ideally, bus stands are organized geographically and according to the direction of travel corridors rather than on individual bus operators. The siting of bus stands within the interchange should be planned to minimise walking distance.

 Determination of adequate number of departure stands and bus layover spaces should take into consideration the following:
- the number of bus routes operating from the interchange that share departure stands at constrained site areas;
- the ability of buses to move independently of each other between and within stands;
- projected bus movements over the design life of the interchange (typically 30 years);
- bus stand capacity;
- the working (operational) timetables of bus routes which indicate driver rest breaks and recovery times;
- ability to accommodate buses “bunching” due to adverse traffic conditions; and
- planned rail replacement bus services and emergency replacement bus services.
Taxis

Interchange design should provide for taxi stands located close to public entry points. Desirable features include:
- shelters, seating, lighting, and telephone access;
- taxi waiting areas clearly identified by appropriate parking controls and private vehicles actively discouraged from using them;
- ease of access for disabled passengers;
- separation from buses; and
- rank locations so that the front passenger door faces the kerbside.

Kiss and Ride (Drop off and pick up)

Interchange design should locate opportunities for kiss and ride (drop off and pick up) close to major entry points. Desirable features include:
- shelters, seating, lighting, and telephone access;
- set down and pick up areas for kiss and ride clearly indicated; and
- bus and taxi areas at the interchange not to be disrupted by kiss and ride waiting zones.

Park and Ride / Commuter Parking

Commuter car parking should be considered at multi access and local interchanges, (generally not global or major interchanges) consistent with the commuter car parking strategy for the rail line concerned and taking into account the principles of the draft Metropolitan Parking Policy.

Desirable features of commuter car parks include:
- located close to adjoining streets or land uses to maximise passive surveillance;
- at grade and multi-deck commuter parking be supported by retail and other facilities as appropriate;
- pedestrian access routes to and through the car park should be well lit and monitored using CCTV; and
- co-share arrangements with retail / shopping facilities pursued where appropriate to maximise use of the infrastructure.

Note these guidelines refer to the relationship between commuter parking and interchanges, and are not guidelines for the design of commuter parking facilities.
Passenger and Staff Facilities

Interchange planning requires a passenger focus where the primary aim is to provide a quality environment with comfortable waiting areas, clear and logical access to and from transport services, adequate and accurate travel information, and protection from bus and other vehicle movements.

Passenger Facilities

Adequate seating should be provided and design of seats should discourage sleeping.

Toilets should be provided at staffed rail stations and at Major / Global / Regional interchanges where warranted by passenger numbers. To assist surveillance at staffed interchanges, toilet entry points should be visible from staff operating areas. Passenger toilets should include accessible toilets. The location of the toilets, whether within or outside the paid area, will depend on the circumstances at the interchange and on interchange operator policy.

Continuous weather protection is desirable over all concourse areas, pedestrian paths and waiting areas for all transport modes. Wind barriers should also be considered as required, and may warrant specialist wind studies to determine needs. The siting of wind barriers should not impede pedestrian flows or compromise lines of sight.

Staff Facilities

At transport interchanges that are also the terminus for bus routes, staff facilities should include toilets. Meal rooms should be considered at major bus interchanges where driver meal breaks are taken. Staff facilities requirements should be determined in consultation with stakeholders including:

- NSW Ministry of Transport;
- RailCorp;
- Local bus operators; and
- Local Ferry operators

Generally, where bus driver toilet and/or mealroom facilities are provided within the transport interchange, the interchange upgrade program funds the capital works and bus companies are responsible for on-going cleaning and maintenance.
Mobility

3.4.3

Accessible design principles

All types of interchange must cater specifically to the various access needs of pedestrians, cyclists and less able passengers. Local planning initiatives that contribute to creating an access friendly interchange and local urban fabric include:

- well signposted disabled parking and set down spaces;
- pedestrian and wheelchair friendly public domain space;
- easy links to the interchange via widened, well located kerb laybacks;
- ground level street frontage that provides sufficient space for wheelchair passage and ramped entries;
- access paths that link the interchange to key destinations;
- at grade movements;
- accessible paths to provide access and egress to and from transport services for people with disabilities; and
- accessible information to enable people with disabilities to plan, choose and utilise the transport service they require.

The following legislation and standards require passenger transport providers to actively pursue improvements to accessibility levels of both services and infrastructure (see Appendix B for more detail):

- The Disability Discrimination Act 1992;
- The Disability Standards for Accessible Public Transport 2002;
- The Disability Standards for Accessible Public Transport Guidelines 2004; and
- Relevant Australian Design Standards.
Signage and Wayfinding

All signage and wayfinding utilised in public transport should match the look and feel of existing public transport in NSW. Consistency of pictograms, colours, fonts, signage and directional language is essential.

To reduce visual clutter at interchanges, signage should be minimal and intelligently located with arrangements made to ensure on-going maintenance. Signage and wayfinding should also include reference to people with accessibility issues, with Braille, raised lettering, appropriate illumination and contrast being considered.

The interchange hierarchy will assist in determining the level of signage and wayfinding required in all levels of public transport infrastructure. Ministry of Transport input into interchange design and development should inform the type and level of signage and wayfinding. For further detail, please refer to the Ministry of Transport’s Introduction to Graphic Standards for Public Transport, available at www.transport.nsw.gov.au.

Safety and Security

Interchange design should maximise actual and perceived safety. Where appropriate, the following elements should be incorporated:

- CCTV in operational areas;
- Adequate lighting for the type of facility;
- capacity to communicate between control centres;
- visual monitoring of the interchange; and
- passive surveillance by incorporating active commercial / retail within the interchange.

Relevant standards include:

- Crime Prevention through Environmental Design Standards (CPTED);
- CityRail Safe Stations Design Guidelines; and
- CityRail Station Design Guidelines.

Adequate lighting levels in all parts of the interchange is achieved by complying with the following:

- Industry standard for lighting of interchanges;
- maximisation of available natural light; and
- construction staging to maintain acceptable lighting within existing interchanges during the construction period.
Crime prevention through environmental design (CPTED) is the application of design and built environment techniques to reduce the incidence and fear of crime and improve quality of life. The concept behind CPTED is that anti-social behaviours such as vandalism, theft, burglary and assault only occur when opportunities exist to engage in them.

Strategies including effective lighting, CCTV systems, visible security, and signage reduce these opportunities and increase both the perception of and the actual likelihood of being caught which in turn acts as a deterrent.

Recommended CPTED applications include:
- maximising use of transparent materials such as toughened glass;
- maximising the use of easily maintained (anti-graffiti) materials and providing strict maintenance schedules;
- locating public transport facilities in clearly visible locations, with adequate lighting, and away from foliage and other objects that can be used to hide;
- locating independent bus stops near existing activity centres such as service stations or shops where natural public surveillance can occur;
- signage that states the area is under constant surveillance;
- providing good lines of sight and avoiding dead ends; and
- maximizing activation by the public and avoiding use of spaces by illegitimate users.
Design of the interchange needs to embody approaches that will be efficient in terms of reducing operating, maintenance and life cycle costs. The interchange design should maximise opportunities for future upgrading and provide flexibility to accommodate increased passenger numbers and transport services if these are predicted to eventuate over the longer term.

A well presented and maintained interchange will encourage commuter use. To maintain presentation standards, each interchange requires an asset management plan that documents formal management arrangements. Ideally each site has a stand-alone plan but because interchange operators manage many similar assets, it is likely that sites will be incorporated into broader asset management plans. In the latter case, separate parts of the interchange may fall into different asset management plans shared by more than one authority – RailCorp and Local council for example.

The interchange management plan should follow best asset management practice and clearly delineate agreed service standards regarding facilities provided, standards of maintenance and levels of cleanliness to be maintained. The plan needs to identify all the assets and services provided by the interchange and identify which operator is responsible for which physical areas. The Interchange Management Plan should be agreed by the agencies during the development / delivery phase of the Interchange and signed off prior to project practical completion.
Interchange Facilities

Minimum Facilities by Interchange Category

Maintaining a consistent standard across all categories of interchanges is a primary objective which other countries have achieved using a modular approach to bus stop and interchange design informed by the number of passengers and the type and frequency of services.

The minimum level of facilities required for the five interchange categories in NSW is provided in Table 4-1.
Table 4-1 Scope of minimum facility provision by interchange category

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<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
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<td><strong>1. Comfort &amp; Convenience Facilities</strong></td>
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<td><strong>1.1 Shelter</strong></td>
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<tr>
<td>Covered links between bus stands and rail concourse</td>
<td>Continuous cover linking rail concourse and bus station and taxi rank</td>
<td>Continuous cover linking rail concourse and bus station and taxi rank</td>
<td>Continuous cover linking rail concourse and bus station</td>
<td>Individual shelter desirable at each bus stand</td>
<td>n/a</td>
</tr>
<tr>
<td>Bus stands</td>
<td>Continuous cover encompassing all bus stands</td>
<td>Continuous cover encompassing all bus stands</td>
<td>Continuous cover encompassing all bus stands</td>
<td>Individual shelter desirable at each bus stand</td>
<td>Individual shelter desirable at each bus stand</td>
</tr>
<tr>
<td>Taxi rank</td>
<td>Continuous cover encompassing all taxi pick-up stands</td>
<td>Continuous cover encompassing all taxi pick-up stands</td>
<td>Individual shelter at each taxi stand</td>
<td>Individual shelter desirable at each taxi stand</td>
<td>Not required</td>
</tr>
<tr>
<td>Kiss and ride (passenger pick-up points)</td>
<td>Continuous cover to match core pick-up zone to meet demand requirement</td>
<td>Continuous cover to match core pick-up zone to meet demand requirement</td>
<td>Continuous cover to match core pick-up zone to meet demand requirement</td>
<td>Individual shelter if warranted by demand</td>
<td>Not required</td>
</tr>
<tr>
<td><strong>1.2 Seating</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus stands</td>
<td>Min seating for 10 people at each stand or as required to meet expected demand</td>
<td>Min seating for 10 people at each stand or as required to meet expected demand</td>
<td>Min seating for 5 people at each stand or as required to meet expected demand</td>
<td>Min seating for 5 people at each stand or as required to meet expected demand</td>
<td>Min seating for 5 people at each stand or as required to meet expected demand</td>
</tr>
<tr>
<td>Designated waiting area</td>
<td>Seating to meet expected demand – min 30% of peak</td>
<td>Seating to meet expected demand – min 30% of peak</td>
<td>Seating to meet expected demand – min 30% of peak</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>
## Table 4-1 Scope of minimum facility provision by interchange category (continued...)

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Taxi rank</strong></td>
<td>Min seating for 10 people at head of rank or as required to meet expected demand</td>
<td>Min seating for 10 people at head of rank or as required to meet expected demand</td>
<td>Min seating for 5 people</td>
<td>Min seating for 5 people</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Kiss and ride (passenger pick-up points)</strong></td>
<td>Min seating for 10 people at head of rank or as required to meet expected demand</td>
<td>Min seating for 10 people at head of rank or as required to meet expected demand</td>
<td>Min seating for 5 people</td>
<td>Min seating for 5 people</td>
<td>Not required</td>
</tr>
</tbody>
</table>

### 1.4 Ticketing (additional to rail station ticket booth and ticket machines)

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Newsstand</strong></td>
<td>Desirable</td>
<td>May be appropriate, depending on mix of uses, level of retail activity and presence and layout of common concourse / waiting area</td>
<td>Not required</td>
<td>Not required</td>
<td>Not generally required, may be appropriate at high usage bus stops and for special events</td>
</tr>
<tr>
<td><strong>Kiosk with prepay tickets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 1.5 Pay telephone

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Locate in areas of passenger concentration, in bus station, at taxi rank</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Locate in areas of passenger concentration such as unpaid station concourse; may be required at taxi rank depending on proximity to concourse</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>On unpaid station concourse</strong></td>
<td>Not required</td>
<td>Not required</td>
<td></td>
<td></td>
<td>Not required</td>
</tr>
<tr>
<td><strong>Not required</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4-1 Scope of minimum facility provision by interchange category (continued...)

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilets</td>
<td>Desirable and could be in bus station or unpaid concourse</td>
<td>Desirable and could be in bus station or unpaid concourse</td>
<td>May be considered</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Baby change facilities</td>
<td>May be considered, depending on expected demand</td>
<td>May be considered, depending on expected demand</td>
<td>Not required</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Kiosk / newsagent</td>
<td>Desirable</td>
<td>Desirable</td>
<td>May be considered</td>
<td>May be considered</td>
<td>Not required</td>
</tr>
<tr>
<td>Cafe</td>
<td>Desirable</td>
<td>Only where feasible</td>
<td>Not required</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Vending machine/Food beverage</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Toilets and meal room with services</td>
<td>May be required depending on bus scheduling arrangements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4-1 Scope of minimum facility provision by interchange category  *(continued...)*

<table>
<thead>
<tr>
<th></th>
<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interchange / station map</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>General bus route network</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Local area street map &amp; key destinations</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
</tr>
</tbody>
</table>

### 2.2 Stand Specific

<table>
<thead>
<tr>
<th>Stand specific bus route numbers &amp; destination</th>
<th>Required</th>
<th>Required</th>
<th>Required</th>
<th>Required</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fare information &amp; zones</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Stand specific timetables and route maps</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

### 2.3 Real time

<table>
<thead>
<tr>
<th>Route information</th>
<th>Desirable</th>
<th>Desirable</th>
<th>Desirable</th>
<th>Not required</th>
<th>Not required, desirable on Tways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next train / bus information</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Service disruption information</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Not required</td>
<td>Not required</td>
</tr>
</tbody>
</table>
Table 4-1 Scope of minimum facility provision by interchange category  (continued...)

<table>
<thead>
<tr>
<th></th>
<th>Global / Regional</th>
<th>Major / Specialised</th>
<th>Multi-access</th>
<th>Local</th>
<th>Strategic Bus Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Parking and Set-down Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Car passenger drop-off and pick-up zones</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Desirable</td>
</tr>
<tr>
<td>3.2 Commuter car parking</td>
<td>Generally not provided</td>
<td>Generally not provided</td>
<td>May be considered where consistent with the Government’s Metropolitan Parking Policy.</td>
<td>May be considered where consistent with the Government’s Metropolitan Parking Policy.</td>
<td>Not required</td>
</tr>
<tr>
<td>3.3 Bicycle parking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycle Locker and / or Rack</td>
<td>Required – Commensurate with forecast level demand</td>
<td>Required – Commensurate with forecast level demand</td>
<td>Required – Commensurate with forecast level demand</td>
<td>Required – Commensurate with forecast level demand</td>
<td>Desirable – Commensurate with forecast level demand</td>
</tr>
<tr>
<td>4. Safety &amp; Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Lighting</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>4.2 Video surveillance</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Desirable</td>
<td>Not required</td>
</tr>
<tr>
<td>4.3 Emergency help point</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Desirable</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>4.4 Public address system</td>
<td>Desirable where operational arrangements support functionality</td>
<td>Desirable where operational arrangements support functionality</td>
<td>Not required</td>
<td>Not required</td>
<td>Not required</td>
</tr>
</tbody>
</table>
Appendix A – Bibliography / References


Technical Notes – Bus Rail Interchange and Supporting Facilities (Final Draft – December 2006) – Queensland TransLink


Sydney’s Metropolitan Strategy – City of Cities (2005), Department of Planning www.metrostrategy.nsw.gov.au


RailCorp Station Access Strategy (Draft under review)

RailCorp Functional Requirements for Future Stations (Draft under review)

Appendix B – Mobility Standards

This section outlines specific areas of legislation that require passenger transport providers to actively pursue improvements to accessibility levels of both services and infrastructure.

The Disability Discrimination Act 1992

The Disability Discrimination Act 1992 (DDA) provides the basis for acceptable standards of accessibility, providing protection for everyone in Australia against discrimination based on disability, and is designed to ensure that nobody with a disability is treated less fairly than a person without a disability.

With particular reference to public transport services, the DDA is designed to ensure that a person with a disability has a right to use services and facilities in the same way as people without a disability. To this end, subsection 31 (1) of the DDA allows for the formulation of standards, known as disability standards, in relation to the provision of public transportation services and facilities.

The Disability Standards for Accessible Public Transport 2002

These standards were developed by the Australian Government’s Attorney-General’s Department from the requirements of the DDA to help public transport operators and providers to remove discrimination from public transport services. The standards specify how DDA objectives are to be realised, and set out a compliance timetable for the replacement and upgrading of conveyances, premises and infrastructure in order to meet these standards.
Appendix B – Mobility Standards (continued...)

The Disability Standards for Accessible Public Transport Guidelines 2004

These guidelines were developed to:
- provide information and comment about the Disability Standards; and
- assist in understanding and interpreting the Standards.

Australian Standards

The following Australian standards are relevant to the Disability Standards, as they apply to the provision of passenger transport infrastructure:

- AS 1428.1 (2001) - Design for access and mobility – General requirements for access – new building work - Part 1
- AS 1428.2 (1992) - Design for access and mobility – Enhanced and additional requirements – Buildings and facilities - Part 2
- AS 1428.3 (1992) - Design for access and mobility – Requirements for children and adolescents with physical disabilities - Part 3
- AS/NZS 1428.4 (2002) - Design for access and mobility – Tactile indicators - Part 4
- AS 2342 (1992) - Development, testing and implementation of information and safety symbols and symbolic signs.