Department of **Transport**

THE GOVERNMENT OF WESTERN AUSTRALIA

Parking Guidelines
for Tertiary Educational Institutions

November 2017

CONTENTS

1. INTRODUCTION

These Parking Guidelines provide a range of strategies and processes to be used when preparing parking supply and management plans for tertiary educational institutions.

Tertiary educational institutions are major trip generators attracting a diverse mix of visitors across different times of the day and year. They also commonly tend to be the largest trip generator within an activity centre. Given this potential for high trip generation, it is beneficial for institutions to develop a sustainable access vision for staff, students and visitors and, support this vision by preparing a Parking Supply and Management Plan (PSMP).

A key catalyst to prepare PSMPs are parking caps placed on most public tertiary educational institutions in Perth by the Western Australian Planning Commission (WAPC). Parking caps are set in an effort to manage congestion on surrounding road networks and to encourage the use of alternative modes of transport.

These parking caps require tertiary educational institutions to adopt or amend parking management strategies (including pricing) to make better use of their existing parking infrastructure, or to accommodate expansions or increasing student enrolments. With support, advice and direction from the Department of Transport (DoT), the preparation of PSMPs by tertiary educational institutions can help to address:

→ changes to parking supply;

→ local traffic congestion and impacts on the surrounding road and public transport networks;

→ pricing strategies and recouping costs associated with providing car parking; and

→ sustainable access for staff, students and visitors.

As such, educational institutions are encouraged to work closely with the DoT, Department of Planning, Lands and Heritage (DPLH) and relevant local government agencies (LGA) early in the preparation (or revision) of their PSMP. This will allow the institution to be fully supported when trying to achieve balanced and integrated transport and land use planning outcomes.
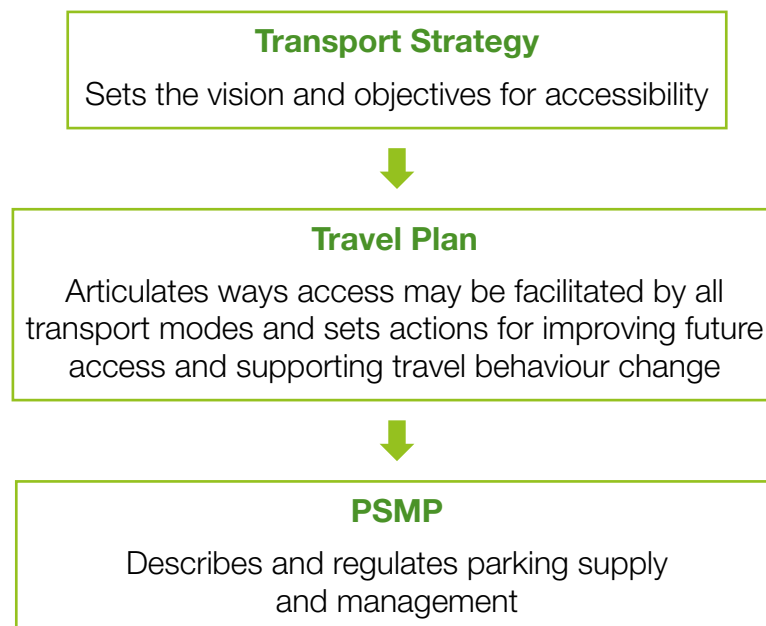
2. WHAT IS A PARKING SUPPLY AND MANAGEMENT PLAN?

A PSMP is an operational document which links parking supply with an appropriate parking management strategy. It will generally focus on how parking is to be regulated and demand managed for the institution. The preparation of a PSMP prompts tertiary educational institutions to review their parking supply and utilisation, estimate future parking demands and prepare or amend parking management strategies to improve both use and equity.

Examples of PSMP objectives include:

→   To better manage parking demand to reduce local traffic congestion.

→   To enable more efficient use of parking supply by encouraging turnover and reducing, or removing allocations to specific user groups (e.g. reserved parking).

→   To better reflect the actual cost of supply and maintenance of parking infrastructure and avoid non-drivers subsidising parking.

→   To improve accessibility by modes other than single occupancy vehicles.

→   To comply with state and local government requirements.

A PSMP forms part of an integrated suite of strategies and plans prepared to support more sustainable access and travel to educational institutions. A transport strategy should set the overarching vision and objectives for accessibility for the institution and consider how access by modes other than single occupancy vehicles can be facilitated. The transport strategy, in part, is achieved by the preparation of a related travel plan that includes initiatives that promote active transport and travel behaviour change through promotion, information, education and associated infrastructure improvements. A PSMP complements and assists in supporting travel behaviour change and promotes alternative transport options through parking supply, constraint and management initiatives.

Transport Strategy

Sets the vision and objectives for accessibility

⬇

Travel Plan

Articulates ways access may be facilitated by all transport modes and sets actions for improving future access and supporting travel behaviour change

⬇

PSMP

Describes and regulates parking supply and management

Implementation of PSMPs, including effective parking supply and management initiatives will ensure that all tertiary educational institutions contribute to a more balanced and multimodal transport system.

Further guidance on strategies and initiatives to support PSMPs can be found in the 'Complementary strategies and policies' secton of this document.

3. WHEN IS A PARKING SUPPLY AND MANAGEMENT PLAN REQUIRED?

Preparation of a PSMP is recommended for all tertiary educational institutions where parking is, or will be provided. Further, a PSMP may be required as a condition of a Development Application.

The preparation of PSMPs are of particular benefit to ensure the best use of available parking supply and can assist with accommodating future expansion plans or increased student enrolments. Any changes proposed to land use, parking supply or parking management are to be discussed with the relevant LGA in the first instance.

It is good practice to review and update an established PSMP on an annual basis. This will ensure it remains consistent with current parking trends and policy, and allow the institution to take advantage of opportunities for improved parking management through research and emerging technologies.

4. HOW TO PREPARE A PARKING SUPPLY AND MANAGEMENT PLAN

A PSMP is best prepared collaboratively with stakeholders, including staff, students and any third party on-site tenants through early and regular engagement. Engagement with the relevant LGA, DPLH and DoT will also allow for a unified, consistent and supportive approach to the preparation of the PSMP. The following table outlines a recommended approach to assist in preparing a PSMP.

Table 1. Recommended PSMP preparation process

Steps	Tasks
Step 1: Scope the PSMP	→ Identify a champion of the initiative and form a supporting reference group. → Establish the principles and objectives to inform the PSMP. These may be guided by a Transport Strategy or Travel Plan where available. → Set a realistic timeline for developing the PSMP. → Identify the stakeholders to be engaged. → Determine the level of support required to develop and implement the PSMP.
Step 2: Review the current approach to managing parking and supply	→ Review current parking behaviour by conducting an observation survey or via data provided from online parking management systems. → Consolidate information regarding current parking supply (locations and users) and actual utilisation. → Compare supply to staff and student populations (e.g. available bays per staff member or student). → Identify current parking management strategies applied, including any fee regimes and time limitations. → Identify the capital and operating costs associated with parking, how they are covered, and where revenues are directed. Prepare a parking balance sheet. → Undertake an audit of the data collected and any additional data available regarding user experience, infringement history and feedback from government and the community. → Summarise the overall transport and access factors of the institution, identifying strengths, weaknesses, opportunities and threats.

Step 3: Engage with stakeholders	→ Prepare a stakeholder engagement program. → Identify appropriate methods for engagement, such as social media, surveys and focus groups. → Undertake engagement as proposed. Early and regular engagement is encouraged. → Record all information received and organise thematically. It is good practice to advise stakeholders on how their feedback has influenced the process and the decisions made.
Step 4: Develop a basic framework and propose parking management strategies	→ Learn from others – identify and understand what other institutions have done and why. → Set targets for the institution. → Define what must be done, what would be nice to do and what cannot or will not be done. → Write up contextual information and select a basic mix of strategies. Make the priorities clear. → Define a basic business model for parking.
Step 5: Workshop strategies	→ Work through and refine the mix of strategies; first with reference group members, next with the relevant LGA and State Government Departments (as applicable), and finally with the community. → Acknowledge feedback. Ensure the principles and the objectives of the PSMP are maintained during and after stakeholder engagement.
Step 6: Define the implementation program and monitoring regime	→ Identify and expand on the key details. → Confirm priorities and the subsequent short-term and long-term actions. → Assign responsibilities. → Confirm funding and necessary institutional support. → Confirm the business model. → Confirm a monitoring regime. Regular and standardised (e.g. six-monthly assessment of parking utilisation) is an effective approach. → Set a review date for the PSMP (preferably on an annual basis).
Step 7: PSMP endorsement	→ Obtain endorsement from the relevant LGA and State Government Departments, (as applicable).
Step 8: Communicate and implement the PSMP	→ Communicate the PSMP to relevant stakeholders. Messaging should be simple and clear, and communication should begin prior to any changes to supply and management are made. → Commence implementation of the PSMP. → Record feedback and amend where appropriate.
Step 9: Monitor effects and review the PSMP	→ Fulfil the requirements of the monitoring regime. → Review results of monitoring against targets. → Review and update the PSMP where necessary. Ensure key initial objectives are being achieved and any major parking management issues are being managed effectively.

5. WHAT TO INCLUDE IN A PARKING SUPPLY AND MANAGEMENT PLAN

All PSMPs should be unique and prepared to address specific parking and access issues of the institution. However, there are a variety of tools available that could be applied broadly to achieve improved parking and access outcomes. Strategies to be considered for inclusion in a PSMP comprise:

→ **Supply constraint** - the recognition of transport modelling and resultant parking caps set for the tertiary educational institution.

→ **Parking controls** - the pricing and fee collection regimes, application of dwell time limits and control of access to bays (e.g. user group specifications).

→ **Communications** - the way-finding systems and dissemination of parking-related information (including online and digital channels).

→ **Monitoring** - the ways in which data will be collected regarding parking use to understand if utilisation occurs as intended or if changes to supply or management is necessary.

→ **Enforcement** - the manner in which parking controls will be applied and the penalties associated with non-compliance.

→ **Peak parking demand management** - the means for controlling access to and overspill effects of surges in demand for parking, which may occur during orientation weeks or other special events.

→ **Maintenance and responsibility** - proposed maintenance schedule for parking to ensure signage, line-marking, drainage and so on are kept in good order.

→ **Alternative transport choices** - the support, promotion and funding of active transport alternatives to access the institution (e.g. providing bicycle parking and end-of trip facilities, such as lockers and showers).
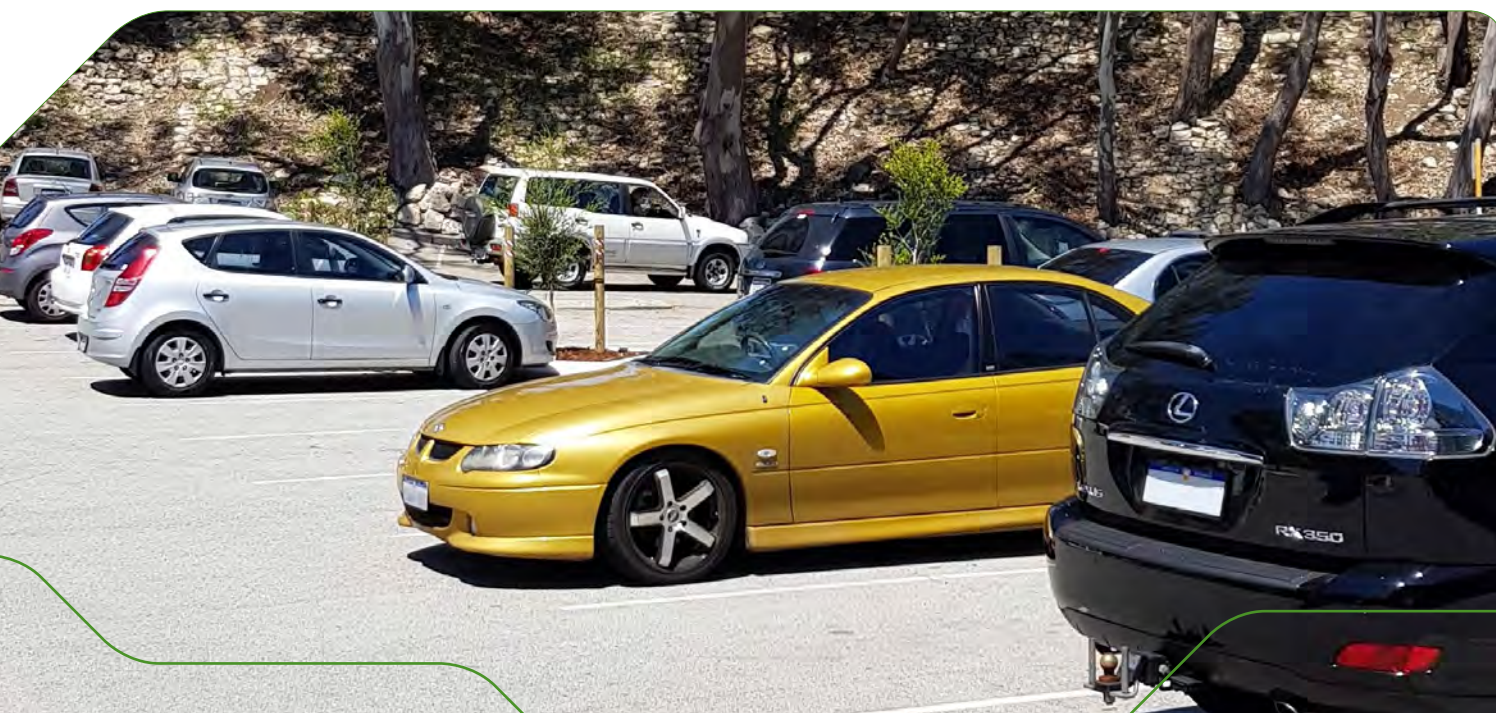
As mentioned in the previous section, when preparing a PSMP and considering content, early engagement with the relevant State Government Departments and the LGA will provide guidance on the level of detail required.

This engagement can also be helpful for resolving challenging management issues such as staging of parking supply or application of interim management measures. However, responsibility for developing specific content will rest with the institution. Table 2 provides content recommended for inclusion in a PSMP.

Table 2. Recommended content for a PSMP

1. Context

→ Include the property address and a location map, comprising all institutions and satellite facilities to which the PSMP applies.

→ Include a summary of existing and proposed:

- full-time equivalent (FTE) academic/core staff and student numbers;
- gross floor area of buildings;
- floorspace allocated to any non-academic or non-core use (e.g. aligned or unaligned research or office tenancy); and
- any on-site residential accommodation (e.g. student accommodation units, public units by type).

Note: The summary is to specify change/new area relative to old, if relating to an expansion project

→ Include the Development Application to which the PSMP relates, or specification that the PSMP is being prepared independent of a new development application.

→ Include operational responsibilities and contact details, including:

- the appropriate Director or Departmental Head (e.g. custodian or owner of the PSMP); and
- the Institution's Transport Planner and/or Travel Planner (if applicable).

2. Applicable details

→ Summarise any applicable requirements, restrictions, proposals or guidelines relating to either parking supply or management, from Development Application, Structure Plans or other relevant documentation (e.g. draft Activity Centres Parking Guidelines).

3. Surrounding area

→ Quantify and show publicly accessible parking on any streets and sites within 400m of the edge of the institution. Any limitations on use of this parking (e.g. time limitations, fees payable) should be noted.

It is important to develop an understanding of parking availability within the surrounding area, particularly to identify and manage possible impact of parking spill over.

4. Parking supply

Core (non-residential) parking

→ Compare car parking supply (existing and proposed) based on the following metrics, as applicable:

- total supply;

- bays per FTE staff (only parking available for their use);

- bays per FTE student;

- bays per 100m2 Gross Floor Area of non-academic/non-core land use;

- total number and ratio of visitor bays (marked for their exclusive use or available to be shared) and/or short-term (less than two-hour) use to total parking supply;

- total number and ratio of car-pool bays to total parking supply;

- total number and ratio of ACROD bays to total parking supply. *ACROD should be supplied at rate in accordance with the institution's Disability Access and Inclusion Plan and meet minimum published standards*; and

- number of service vehicle bays.

→ Compare bicycle parking supply, current and proposed, including allocation of parking to tenants and visitors according to relevant Australian Standards and other relevant policy (e.g. class of facilities). Include the provision of any end-of-trip facilities.

→ Include the allocation of parking in at-grade, multi-storey facilities, basements and/or undercroft.

→ Include the current and proposed parking layout plan (schematic).

Residential parking*

→ Compare car parking supply (existing and proposed) based on the following metrics, as applicable:

- total supply;

- bays per student housing unit (only parking set aside for their use);

- bays per general accommodation unit;

- total number and ratio of visitor bays (marked for their exclusive use or available to be shared) to total parking supply; and

- total number and ratio of ACROD bays to total parking supply.

→ Compare bicycle parking supply, current and proposed, including allocation of parking to tenants and visitors according to relevant Australian Standards and other policy (e.g. class of facilities). Include the provision of any end-of-trip facilities.

→ Include the current and proposed parking layout plan (schematic).

→ Include the provision or availability nearby of car-share vehicles.

*Will only apply to institutions with student and/or general residential housing.

5. Proposed parking management strategies

Parking controls

→ Describe any parking zone system based on user-groups, time limits by location, parking price differences or other restrictions. For example, parking zones defined on proximity to high-demand buildings or sites and priced/timed accordingly.

Include an explanation of the rationale for the system being proposed and include any changes to the status quo.

→ Describe time limits being applied to bays and show on a parking plan.

Short-stay parking is generally provided in premium locations (i.e. nearest student centres and administration buildings). A reasonable proportion of long-stay parking can be maintained to serve staff and students staying on campus for half-days (e.g. four hours) and upwards.

→ Define the fee system being applied to parking and whether this includes any pre-pay/permitting component. Spatial differences for fee paying/permits to be shown on a parking plan.

Include an explanation of the rationale for the system being proposed.

→ Explain how fees are, or will be levied and invested in the promotion of alternative access modes.

This may be through a manual (e.g. ticketing machine with 'pay and display' or access controls such as boom-gates) or an electronic system.

→ Specify any arrangements and rationale regarding shared use of parking.

Shared parking arrangements for consideration include:

- *staff/student parking bays being made available to non-campus users outside periods of peak demand; or*
- *bays off-campus being available for students, staff, or campus patrons for particular time periods.*

Off-site shared parking arrangements are practical where there are complementary parking demand profiles (e.g. adjacent land uses with greater demand on weekends and little demand on weekdays would complement a typical educational institutions demand profile). Off-site shared parking arrangements are subject to a relevant legal agreement. Note: The control of on-campus parking allocation is to remain with the institution (e.g. bays are not leased to third parties for their exclusive use).

Communications

→ Specify how parking allocation and controls (including bicycle parking) will be communicated.

→ Describe the way-finding system and include signage examples and locations on the parking plan.

→ Define the service vehicle/courier access strategy: e.g. communications to outside service providers and way-finding signage, proposed servicing hours and booking system proposed, if applicable.

Monitoring and enforcement

→ Summarise the monitoring and enforcement schedule and its intent (e.g. to mitigate non-payment by user groups or non-compliant parking). Any proposed deployment of technology (e.g. CCTV or bay occupancy monitoring devices) should be included, if applicable.

The use of technology can yield benefits including real-time occupancy data, time series information regarding the use of parking and dwell time data for planning and enforcement applications.

→ Define the penalties to be imposed and the circumstances/violations to which they relate (e.g. fines or use of wheel-clamps, whether any warning notes will be issued rather than other penalties on first offence).

→ Specify a parking utilisation monitoring regime including a regular (e.g. annual) audit of:

- short-stay and long-stay parking usage to assess whether conversion of some bays to different status or time limitation and/or adjustments to the pricing regime (if applicable) is needed;

- Car-pool bays (if used) to understand if supply is reasonable given demand;

- ACROD bays to understand if supply is adequate given demand; and

- service vehicle parking/loading bay usage to assess whether additional facilities or changes to the servicing strategy may be required.

Peak demand parking management protocols

→ Describe parking management required to manage impacts to the circulation and movement network during the institution's peak period.

Where available, reference should be made to historic peaks and past success or challenges associated with implementing any management measures. Peaks can also include special events, including orientation weeks and the first few weeks of teaching semesters prior to the deadline for withdrawal from courses. Parking management measures to manage these peaks may include:

- *temporary unmarked and unpaved overspill parking areas either on or off-site;*

- *any complementary services (e.g. a shuttle service to convey staff/students to the campus from more distant parking locations);*

- *increase the frequency of on-site parking inspections and liaise with the relevant LGA to monitor off-site parking by staff or students on public streets and residential areas; and*

- *modify enforcement procedures, which may include removing warning notifications and increased penalties for non-compliance.*

Maintenance and responsibility

→ Define the maintenance schedule for parking infrastructure and the responsibility for maintaining the infrastructure; especially for line-marking of bays, way-finding devices, signage, pay-stations and access controls.

It is important a PSMP includes proactive and regularly scheduled maintenance of existing parking bays and its supporting infrastructure.

6. Parking staging detail (if applicable)
→ Describe the approach for staging delivery of any new parking, or conversion of existing parking from its current form (e.g. at-grade parking) to basement, undercroft or multi-storey. Describe how this may be subject to interim parking management measures. Include appropriate maps and designs.

7. Implementation strategies
→ Define the proposed approach to be taken to implement the PSMP, including short-term and long-term actions, assign responsibilities and confirm funding or other support resources required.
→ Outline the communication plan to inform relevant stakeholders of the PSMP.
It is best to communicate a PSMP before any changes to parking supply and management are implemented. Keep messaging clear and simple.
→ Specify the review date for the PSMP.
A PSMP is best treated as a living document that is reviewed and updated annually.

Table 3 is a checklist provided to assist with developing and implementing a PSMP. Not all variables will apply to all institutions but are important to consider.

Table 3. Checklist for preparing a PSMP

Steps	Tasks	
Planning	→ Identify a champion or champions	☐
	→ Obtain support/approval/endorsement from senior management	☐
	→ Set principles and objectives	☐
	→ Consolidate existing parking supply and management information	☐
	→ Observe current parking behaviours	☐
	→ Define the current parking balance sheet	☐
	→ Establish the broader transport and access context	☐
	→ Identify stakeholders	☐
Development	→ Consult widely and record feedback	☐
	→ Fit strategies to needs	☐
	→ Set targets, priorities and secure any funding requirements	☐
	→ Assign actions and responsibilities to individuals or stakeholders	☐
	→ Establish the parking business model	☐
	→ Define a monitoring strategy	☐
	→ Receive endorsement from senior management and government	☐
Implementation	→ Communicate the details of the PSMP to key stakeholders prior to any changes being made	☐
	→ Undertake necessary monitoring and subsequent amendments	☐
	→ Review the details of the PSMP on an annual basis	☐

6. COMPLEMENTARY STRATEGIES AND POLICIES

A PSMP is best complemented by strategies, policies and initiatives that support the parking management approach taken and encourage investment in alternative transport modes, such as:

→ walking;

→ cycling;

→ public transport; and

→ on-demand transport;

> **On-demand transport** includes a taxi, charter vehicle or regular passenger transport vehicle, which provides a passenger with flexibility around the route they take and the time they travel.

These complementary strategies, policies and initiatives are usually identified in a Transport Strategy or Travel Plan prepared for the tertiary institution (refer to page 4, for guidance on the relationship between transport strategies, travel plans and PSMPs).

Travel behaviour change

→ The success of a PSMP, particularly when parking caps are in place, can be greatly improved where institutions also focus resources towards supporting travel behaviour change activities and the implementation of a related Travel Plan.

→ The DoTs Your Move program provides support to institutions encouraging travel behaviour change towards more active transport options. Workplace champions, such as Transport Planners, Health and Wellbeing Coordinators and others wanting to encourage staff and students to walk, cycle or catch public transport can join the Your Move network to access information, ideas and rewards to aid their efforts. Materials including information regarding the parking supply and management policy, local public transport options and bicycle and pedestrian accessibility can be provided in induction packs to staff and students during orientation.

Investment in infrastructure

→ Bicycle lanes and paths, and end-of-trip facilities aid active transport trips to, from and across an institution. For small institutions, a simple path network, clear way-finding and centralised end-of-trip facilities often work well. Larger institutions will benefit from a more comprehensive path network, consistent and regular way-finding, and a number of end-of-trip facilities co-located with main buildings/attractions.

→ Routes designed for, and favouring public transport access such as bus priority measures and queue jumps can alleviate congestion on busy roads on approach to an institution. DoT can provide more advice in this area, and reference materials published by the Public Transport Authority are useful to understand circumstances when these facilities can be considered.

Space management

→ Consider the provision of spaces to support car-pooling, car-sharing and drop-off bays for ride-sharing services. There is potential for greater use in the future and having adaptable parking to cater for this different and changing mix of parking demands is important.

→ Parking bays located closest to building entrances, such as drop-off bays, can be line-marked and signed for use by registered car-poolers only.

→ Some kerbside space close to buildings may be allocated to drop-off/pick-up bays for taxis and ride share services.

→ The institution may maintain a car-pool fleet, or maintain an agreement with third party operators for car-sharing and locate these vehicles in premium locations. Share vehicles can be available for use by staff and/or residential students (the latter through subscription) and address some people's need for access to a vehicle during the day for business trips or to run errands.

Increased service

→ Currently, Perth's public universities co-fund public transport services that directly serve their institution. Co-funded public transport services may yield additional routes, higher service frequency or longer operating hours. Overall, high service frequencies will make public transport a more appealing choice for staff, students and visitors. Revenue raised from parking could be hypothecated to a public transport fund or similar to be used for other sustainable transport outcomes (after parking capital, maintenance and operating costs are covered) rather than being deposited in general revenue.

→ Funding could be allocated to a local shuttle service to meet internal trip demands and connect with adjacent residential areas and off-institution trip attractors.

Coordination

→ A car-pool registry could be coordinated and maintained by institutions to connect staff and students with common travel routes and times. The institution may also offer a guaranteed ride home which gives prospective car-poolers the confidence that they will have an option to get home even if the designated driver cannot facilitate a return trip.

→ A Bicycle User Group could be coordinated and maintained by the institution to connect current and prospective cyclists. Such groups can advocate for cyclists' interests, provide support for less confident riders, opportunities for group rides, and for skills development, training and information sharing.

Communication and education

→ Larger institutions may employ part or full-time Travel or Transport Planners, whereas smaller institutions could consider travel and transport planning to be part of the role description for select staff. These staff can coordinate the dissemination of information among staff, students and visitors regarding transport, access and parking, including making people aware of parking supply and management policies. They can also develop and deliver initiatives to support the use of alternatives to driving alone e.g. incentives or challenges for active commuting, peer support schemes for novice cycle commuters or opportunities for using public transport, cycling or car-pooling or car-sharing.

Land use and transport integration

→ Residential colleges and housing on or near the institution can help facilitate access by walking, cycling or shuttle bus. It is also likely to add to institution life, supporting evening and weekend activities.

→ Integration of mixed land use on an institution can provide staff, students and visitors with access to a wider range of additional goods and services, and reduce peoples' need to leave the institution. Larger institutions can support cafés, retail (often, a broad range of different stores), entertainment and recreation.

Reducing demand

→ Scheduling of lectures and other activities on campus to manage peak or high demand for access and parking, by spreading across the day and/or week to avoid heavy concentration of activities at common times.

7. CONCLUSION

The extent to which a tertiary educational institution can be accessed by students, staff and visitors varies dependent on its location, size and access to roads, parking, public transport services and active transport networks. Each educational institution is unique and requires different traffic management initiatives, strategies and tools to support balanced transport and land use outcomes.

Managing parking supply, pricing, location and duration of stay will contribute towards effective road congestion management by reducing traffic and discouraging single occupancy private car use. The application of these Guidelines can lead to a more efficient use of limited parking resources (including where parking caps are set) and provide additional support for active travel and public transport options.

These Guidelines assist educational institutions to prepare a specifically tailored PSMP to improve parking management on-site and to help achieve an overall vision for sustainable access for all tertiary educational institutions.

8. KEY RESOURCES

Department of Transport

Transport Planning Guidelines - covering integrated transport planning, transport modelling, car parking and targeted behaviour change - http://www.transport.wa.gov.au/projects/transport-planning-guidelines.asp

Your Move - providing online access to tools, information and support to encourage travel by walking, cycling or public transport https://yourmove.org.au/ Includes a Case Study of Edith Cowan University Transport Management Group - https://yourmove.org.au/resources/edith-cowan-university-transport-management-group/

Initiatives employed and level of information provided by other institutions

Australia

Public transport, cycling, campus bus services, car-pooling and pay-as-you-go parking see Curtin University - http://properties.curtin.edu.au/gettingaround/

Active forms of transport and public transport see Edith Cowan University - http://www.ecu.edu.au/centres/facilities-and-services/our-services/parking/overview and http://www.ecu.edu.au/centres/facilities-and-services/our-services/environmental-management/transport

Parking permits see Murdoch University - http://our.murdoch.edu.au/Campus-and-Facilities-Management-Office/Our-services/Parking-on-campus/

Smart travel alternatives to travelling by car see South Metropolitan TAFE - http://www.southmetrotafe.wa.edu.au/content/smart-travel

Campus shuttle bus and transport options (cycling, walking, public transport and driving) see University of New South Wales - http://www.facilities.unsw.edu.au/getting-uni

International

Vehicle and bicycle parking see Ryerson University (Toronto, Ontario) - http://www.ryerson.ca/ubs/parking.html

Cycling, car-pooling and public transport see Stanford University (Bay Area, California) - https://transportation.stanford.edu/

Campus shuttle bus see Princeton University (New Jersey, US) - http://www.princeton.edu/main/visiting/

Public transport options see University College Dublin (Dublin, Ireland) - http://www.ucd.ie/gettingtoucd.htm

Public transport, including Subway Park and Ride Scheme see University of Glasgow (Glasgow, Scotland) - http://www.gla.ac.uk/about/maps/howtogethere/

Sample reference literature

Curtis, C., and Holling, C. (2003) Universities TravelSmart Resource Kit. Australian Greenhouse Office, Canberra, available: http://www.travelsmart.gov.au/universities/pubs/universities.pdf

Delmelle E. M. and Delmelle E. C. (2012) 'Exploring spatio-temporal commuting patterns in a university environment', Transport Policy (21), pp1-9

Rotaris L. and Danielis R. (2014) 'The impact of transportation demand management policies on commuting to college facilities: A case study at the University of Trieste, Italy', Transportation Research Part A (67), pp127-140

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APPENDIX

Perth context – supply data for Universities in Perth

Table 4 outlines the supply data for several universities in Perth, including Curtin University, Edith Cowan University and Murdoch University. The table shows how parking supply, which is measured as the ratio between FTE staff and students and available bays, varies significantly between universities depending on historic policy and university growth. Higher parking supply for staff than students occurs in all instances. The table illustrates there is typically an oversupply of parking at all universities and reserved bays with permits can often remain dormant compared to parking bays with higher turnover rates under a PAYG strategy. The table highlights that despite the location relative to public transport and good cycling paths, each university caters heavily for parking for staff, students and visitors.

Table 4. Comparison of parking supply and utilisation statistics, sample of Perth universities

University (year)	Staff				Students			
	FTE	Parking supply	Ratio	Maximum utilisation of designated parking	FTE	Parking supply	Ratio	Maximum utilisation of designated parking
Curtin University (2012)	4,500	2,580	0.57	83%	31,200	3,851	0.12	83%
Edith Cowan University Joondalup Campus (2014)	1,124	745	0.66	92%	7,265	1,724	0.24	83%
Edith Cowan University Mount Lawley Campus (2014)	396	390	0.98	90%	5,006	1,288	0.26	82%
Murdoch University (2013)	1,412	3,255*	0.37	87% #	11,000	3,020^	0.25	87% #

* Significant parking was available to both staff and students. The specified total includes 235 staff reserved bays for exclusive use.

^ Significant parking was available to both staff and students. The specified total excludes the 235 staff reserved bays.

Data collected via a midday spot-count by university staff during the fourth week of Semester One. Data reported for car parks as a whole, not for type of bays so finding is an average across all classes of parking (includes visitor, ACROD, loading bays, etc.)