INTEGRATED TRANSPORT & MOVEMENT PLAN

FINAL
JANUARY
2017

CREATING THE CITY
OF INNOVATION

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EXECUTIVE SUMMARY

1.0 INTRODUCTION 6

2.0 URBAN AND PLANNING CONTEXT 10

3.0 IMPERATIVES FOR ACTION 14

4.0 APPROACH TO INTEGRATED TRANSPORT AND MOVEMENT 16

5.0 STRATEGIC PROJECTS 20

6.0 EVALUATION AND REPORTING 30

APPENDICES

APPENDIX A
TRANSPORT AND MOVEMENT AT CURTIN TODAY

APPENDIX B
COMMUNITY CONSULTATION

APPENDIX C
NEEDS ASSESSMENT

APPENDIX D
PROJECT PRIORITISATION FRAMEWORK

APPENDIX E
THE FUTURE OF TRANSPORT

EXECUTIVE SUMMARY

The Greater Curtin Master Plan sets down a vision for transport and movement at the Bentley campus. Its aim is to ensure that movement within campus is pleasant and intuitive, while connections to the wider community and Perth are logical, safe and convenient.

The purpose of the Curtin Integrated Transport and Movement Plan (the Plan) is to assist in achieving this vision through guiding an integrated approach to both the delivery and development of the University's transport and movement network. It provides a framework to assist decision-makers and staff in prioritising investment decisions which will work toward achieving the vision, create value and meet the needs of the University community today and in the future.

The Plan has been developed collaboratively with the University community and included a four week consultation period. Staff, students and visitors were invited to share their views on the University's approach to transport and movement and identify deficiencies in accessing the campus today.

Outcomes of the community consultation highlighted the need for Curtin to develop strategic projects which address four key areas of focus, namely:

- Improving access options;
- Travel behaviour change;
- Wayfinding; and
- Advocacy and leadership.

The Plan includes twelve strategic projects which reflect the key areas of focus. The projects have been prioritised utilising a Project Prioritisation Framework which applies an outcomes driven approach.

The twelve strategic projects proposed by the Plan, listed by area of focus and priority, are summarised below:

Area of Focus	Priority	Project
Improving access options	1	Cycle network capital works implementation programme
	1	Pedestrian network improvement plan
	2	Fleet car strategy
	2	Investigate provision of dedicated carpooling bays
Travel behaviour change	1	Bypass Programme relaunch
	2	Promoting active lifestyles
	3	Promoting public transport
	4	Promoting carpooling
Wayfinding	1	Campus wayfinding strategy
	2	Smart parking technology
Advocacy and leadership	1	Advocate for improved public transport
	1	Advocate for improved regional cycling facilities

1.0 INTRO-DUCTION

"The Great University… should look ever forward: for it the past should be but a preparation of greater days to be."

JOHN CURTIN,
FORMER AUSTRALIAN
PRIME MINISTER
1941–1945

PURPOSE

The intent of the Curtin Integrated Transport and Movement Plan (the Plan) is to guide an integrated approach to the development and delivery of the University's strategic vision for transport and movement as set down within the Greater Curtin Master Plan.

THE PLAN SEEKS TO:

- Reduce dependence on single occupant car use ;
- Reduce our environmental impact ;
- Promote active lifestyles;
- Provide a mechanism to engage and communicate with the wider Curtin community; and
- Respond to the requirements and commitments identified in relevant plans including the Greater Curtin Master Plan, Green Star Communities and the Bentley Campus Environmental Risk Management Plan.

OBJECTIVES

THE OBJECTIVES OF THE PLAN ARE TO:

- Inform transport and movement investment decisions to ensure they create value and meet the needs of the University community;
- Inform the delivery of strategic projects;
- Provide a framework for project prioritisation, tracking and reporting;
- Provide strategic and operational key performance indicators for defining success;
- Create a governance structure with defined roles and responsibilities;
- Provide leadership and advocacy opportunities;
- Identify future trends and technology so that Curtin can evaluate and adapt infrastructure to improve mobility in to the future; and
- Provide a framework for continuous improvement.

AUDIENCE

THE PLAN IS AIMED AT TWO AUDIENCES:

- The University community: The Plan communicates the University's approach to transport and movement and details the types of projects to be delivered in the next one to five years.
- Properties, Facilities and Development (PF&D): The Plan is designed to guide staff and decision makers within the PF&D team on asset investment outcomes and the type of projects required to deliver an integrated approach to transport and movement. It provides a framework for the review, assessment and prioritisation of projects going forward.

SCALE

The Plan addresses transport and movement at Curtin's Bentley campus, including Technology Park.

GOVERNANCE

The development and implementation of the Plan is the responsibility of Curtin University Properties, Facilities and Development (PF&D). Coordinating the implementation of the Plan will be the responsibility of a dedicated Transport Coordinator will form part of PF&D Operations & Maintenance.

PF&D PLANNING

- Setting the strategic direction;
- Plan implementation and coordination;
- Plan evaluation against key performance indicators;
- Integrating reporting into the improvement process; and
- Annual reporting.

PF&D CAPITAL WORKS

- Delivering infrastructure projects requiring Capital investment; and
- Assesing new projects against the priorities identified within the Plan.

PF&D OPERATIONS & MAINTENANCE

- Championing implementation of the Plan;
- Delivering projects of an operational nature (eg. travel behaviour change projects);
- Liaising with transport authorities;
- Advocacy; and
- Tracking, monitoring and reporting outcomes.

PF&D DEVELOPMENT

- Place activation and commications
- Events

Figure 1/ PF&D department responsibilities

PROCESS

The Plan has been developed using a three stage process.

The first stage involved determining the objectives of the Plan and defining the University's approach to transport and movement at the Bentley campus.

The second stage involved providing the University community with the ability to comment on the University's proposed approach to transport and movement. The University community were also invited to provide feedback on their current experiences accessing the University and to identify areas for improvement.

The third stage involved utilising the information gathered during stages one and two to inform a needs assessment. This needs assessment shaped the direction of the Plan including the strategic projects to be delivered.

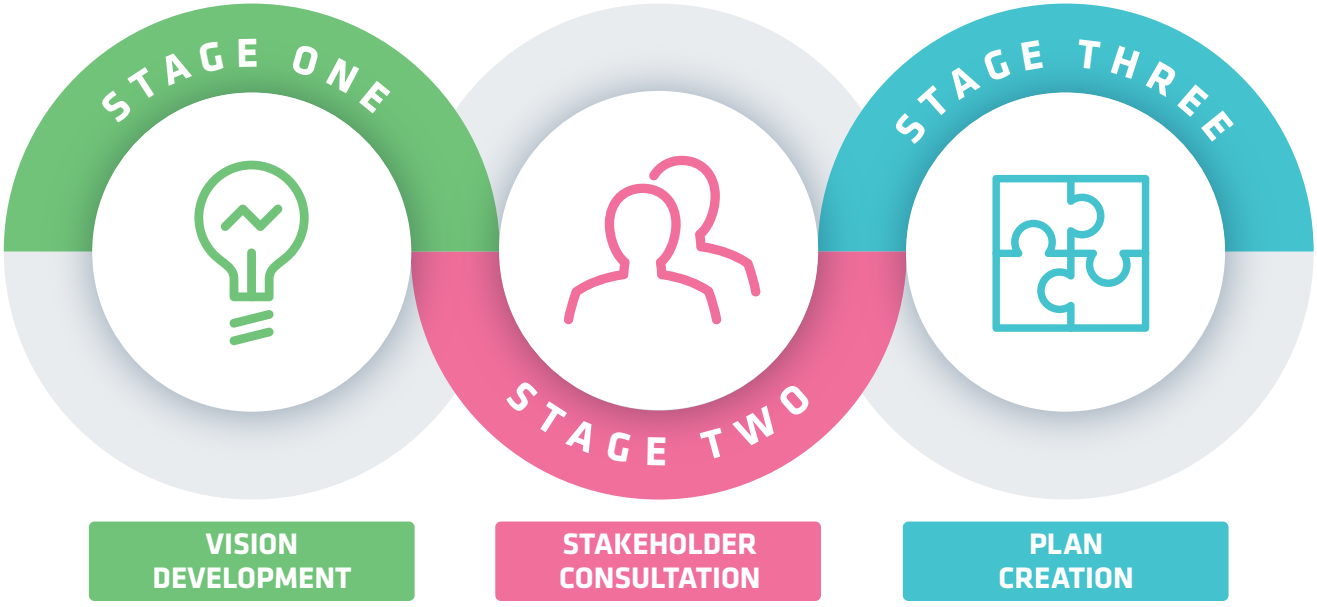


Figure 2/ Plan development process

2.0 URBAN AND PLANNING CONTEXT

URBAN CONTEXT

Curtin University's vision is to become a 'recognised global leader in research, education and engagement' with a desire to position itself within the top 200 universities globally by 2020. As an educational facility with over 24,700 Equivalent Full Time Student Load (EFTSL) (based on 2015 data) Curtin's Bentley campus plays a vital part in supporting the communities it operates in.

Curtin University has embarked on a journey to deliver an urbanised Bentley Campus based on the Greater Curtin Master Plan. To retain and extend a competitive advantage as a modern, relevant university Curtin University must continue to evolve. Today, the trajectory is to extend a traditional offer by developing into a new, multidimensional place, leveraging the University's resources and creating a new urban heart for Bentley and its community. This is Greater Curtin, a 'City of Innovation' that offers people – be they staff, researchers, students, community members or employees from a variety of industries – the opportunity to learn, live, work, and 'play' in a sustainable place where knowledge and innovation extend beyond buildings.

These efforts have not gone unnoticed, in February 2015, Curtin was awarded Australia's first 5-Star Green Star-Communities rating from the Green Building Council of Australia (GBCA). The 5-Star rating, which equates to 'Australian Excellence' was earned after the University Master Plan was assessed against benchmarks for governance and innovation, design excellence, environmental sustainability, economic prosperity and liveability.

The Greater Curtin Master Plan informs the physical response to the University's vision and role in cultivating Bentley's urban heart. The Master Plan is underpinned by three key principles:

- OUR ENABLED ECONOMY A prosperous economic hub that encourages and facilitates diversity, innovation and a resilient local market.
- OUR CONNECTED COMMUNITY A liveable, diverse, affordable and inclusive community that promotes social interaction and citizen ownership; a community that is safe and caring that focuses on people's wellbeing. The Plan plays an important role in achieving these outcomes.
- OUR LIVING ENVIRONMENT An approach that is respectful of the existing environmental systems and seeks to protect and restore our natural assets and implement solutions that reduce our ecological footprint.

WESTERN AUSTRALIAN PLANNING CONTEXT

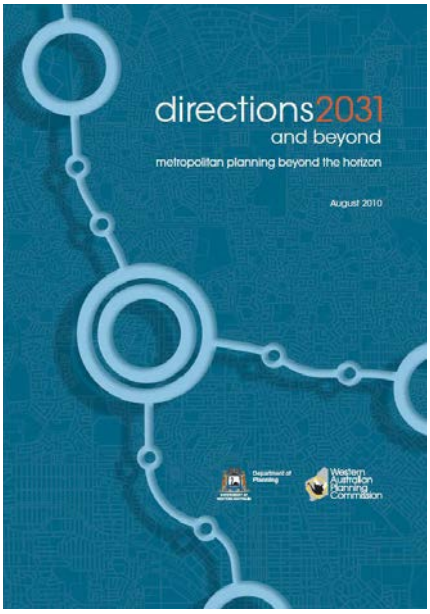
As well as providing spatial stratgies to support Curtin University's vision, the Plan responds to the aspirations set by the Western Australian (WA) Government's strategic plan for the Perth and Peel region, the Bentley-Curtin Specialised Activity Centre and the emerging Perth Transport Plan.

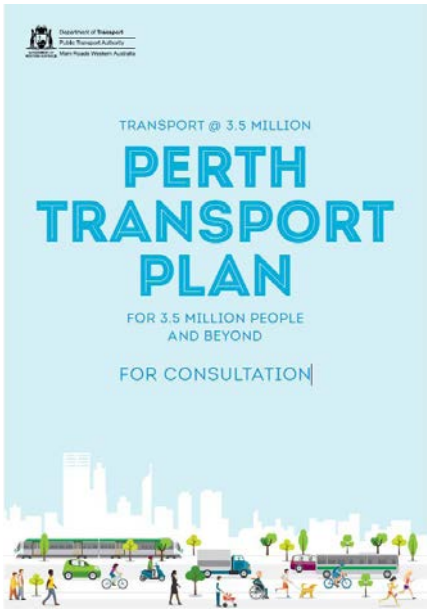
Directions 2031 and Beyond (D2031) provides the overarching spatial planning framework for the Perth and Peel Regions. Within its Activity Centres Network, Bentley-Curtin, is recognised as a Strategic Specialised Activity Centre.

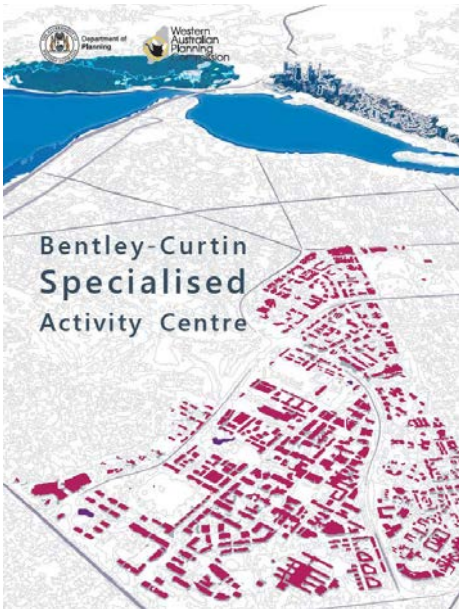
The Draft Bentley-Curtin Specialist Activity Centre Structure Plan envisions an innovative, creative and collaborative centre of excellence in science, technology, education and research supporting the State's economic growth through the development and commercialisation of ideas into viable and sustainable enterprises. A vibrant place that is accessible, safe, sustainable, affordable and attractive for people to study, work, live and enjoy.

It will deliver a more integrated street network, the coordinated management of parking, additions to the pedestrian and cycling networks and expanded public transport services.

The Draft Perth Transport Plan sets the vision for Perth's future transport network as the population approaches 3.5 million. It provides a long term plan for transport infrastructure, outlining a flexible transport system which can respond to the need of people and freight. A key aspiration of the Plan is the addition of light rail providing an inner orbital link connecting UWA and QEII to Canning Bridge, via the Perth CBD, Victoria Park and Curtin University.







3.0 IMPERATIVES FOR ACTION

IMPERATIVES FOR ACTION

The University will experience significant change over the coming decade as a result of the delivery of the Greater Curtin Master Plan and growing community. Projected University growth remains strong, despite recent slowdown in economic activity. Preliminary modelling suggests that by 2031 the Bentley campus will grow from 24,700 Equivalent Full Time Student Load (EFTSL) to 33,600 requiring approximately 85,000 m2 of additional Usable Floor area (UFA), and an annual commitment of circa $86million to meet the University's ambition.

Regardless of future growth, Curtin is unable to construct new parking facilities without the approval of the WA Planning Commission (WAPC). The WAPC is enforcing a cap on the number of parking bays available at Curtin (and in the Curtin Specialist Activity Centre) as a means of managing traffic congestion on roads.

Together these factors raise both challenges but also opportunities for transport and movement at the Bentley campus.

- ENVIRONMENTAL IMPACT: The University's Environment Risk Management Plan identifies the need to improve efficiencies and reduce emissions in relation to transport. The University's ultimate objective in relation to transport and movement is to reduce reliance on single occupancy vehicles which will in turn reduce vehicle emissions.
- TRANSPORT INNOVATION: As the local population and building footprint increases, new transport challenges will require innovative solutions. The need to manage travel demand during peak periods and larger events will increase in importance.
- TRANSPORT INVESTMENTS: The Curtin Bus Interchange will dramatically increase the visibility of public transport within the campus. The development of travel behaviour change programmes will be critical to realising the transformative potential of the project.
- CHANGING TRANSPORT PROFILE: The changing profile and demands of students is altering the University's transport needs. Online teaching and more intense study outside of the traditional semester are all factors that the outcomes of the Plan will consider.
- STUDENT EXPERIENCE: The Greater Curtin Master Plan highlights the importance of student experience to the University's competitiveness. Access to and from the campus forms a critical part of the overall student experience. Transport and movement also has a fundamental role to play in stimulating campus activation and connecting the campus to Perth CBD.

4.0 APPROACH TO INTEGRATED TRANSPORT & MOVEMENT

APPROACH TO INTEGRATED TRANSPORT AND MOVEMENT

The University's philosophy for transport and movement is to facilitate sustainable and active mode choices which make it easy and safe to get to and around Curtin in order to improve the user experience and enable connectivity for all members of the campus community.

This philosophy will shape future projects delivered by the University over the next 10 years and provide a reference point to ensure each new transport and movement project opportunity and initiative builds towards delivering Greater Curtin vision.

Curtin's approach to transport and movement can be summarised as follows:

- Provides the University community with a range of transport options;
- Communicates the transport options available in a coherent and engaging manner;
- Provides mechanisms to allow the University community to make more informed transport decisions.
- Promotes the benefits of active travel and reduced reliance of private vehicle use; and
- Enhances access to passive and active recreation activities.

Key to Curtin's approach to transport and movement is a hierarchy which prioritises pedestrians, cyclists and public transport users over single occupancy vehicles.

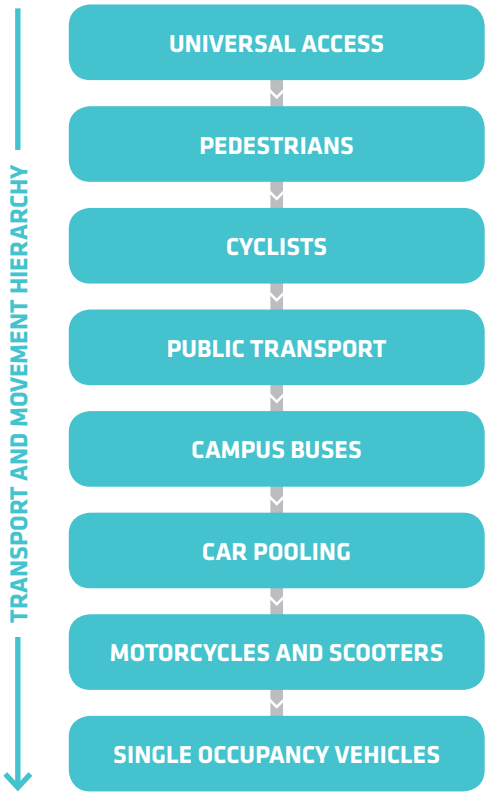


Figure 3/ Transport and Movement Hierarchy

UNIVERSAL ACCESS

Improving accessibility and inclusiveness for students, staff and visitors with a disability will continue to remain a priority of the University. The University will continue to implement the strategies outlines in the Disability Access and Inclusion Plan 2012 – 2017.

The Curtin Universal Design Guidelines details seven Universal Design Principles specific to Curtin University, addressing:

- Equitable use - Buildings and the public realm at Curtin should provide the same method of use for people with diverse abilities.
- Flexibility in use - The design of the Curtin University buildings and public realm should accommodate a wide range of individual abilities.
- Simple and intuitive use - The layout of Curtin University, including buildings and external environments should be logical, easy to understand without requiring any prior knowledge base of the campus, services and facilities.
- Perceptible information - provide adequate contrast between essential information/ amenities and their surrounds with visual, tactual, auditory contrasts.
- Tolerance for error - Campus layouts, designs, spaces, ongoing constructions and events are to be safe and logical to navigate.
- Low physical effort -The campus should enable efficient and comfortable navigation with a minimum of fatigue.
- Size and space for approach and use - Throughout the campus, including buildings and external facilities, adequate space should be provided to accommodate a variety of users, regardless of body size, postures or means of mobility.

PEDESTRIANS

The University's is committed to delivering a comprehensive and connected pedestrian network that:

- Provides legible, safe, comfortable and enjoyable connections along key desire lines;
- Provides convenient access to and links important destinations such as retail, commercial, academic, cultural and recreational activities; and
- Promotes a healthy and active lifestyle for people living, working and playing at the Bentley Campus.

CYCLISTS

Complementing the University's pedestrian pathways should be a well-connected cycle network that facilitates movement between key origins and destinations in and around the Bentley Campus. The University is committed to:

- Delivering effective links into the external cycle networks;
- Advocating for improvements to the regional cycle network; and
- Providing quality end of trip facilities.

PUBLIC TRANSPORT AND CAMPUS BUS

The University aspires to the deliver an efficient and convenient public transport network to the heart of the Bentley campus, which:

- Maximises the public transport catchment and accessibility across campus;
- Delivers a high quality user experience;
- Provides seamless and legible interchange between modes of transport;
- Prioritises the need of an effective public transport network over private vehicles;
- Interfaces with and supports appropriate land use activities;
- Contributes to the creation of a high quality and strong urban character; and
- Sets an outstanding local context to tie into future external transit priority facilities.

CAR POOLING

The University wishes to facilitate more efficient private vehicle use through measures such as carpooling and ride sharing. The total number of car parking bays on campus are capped, regardless of future growth, demonstrating the need to make better use of the facilities provided. By sharing a ride the pressure on the demand for car parking is eased, making it easier to find a bay and reducing the community's reliance on private vehicles.

MOTORCYCLES AND SCOOTERS

The University wishes to make more efficient use of land allocated to car parking. Motorcycles and scooters require significantly less land to park and reduced emissions when compared to single car occupancy.

SINGLE OCCUPANCY VEHICLES

The University aims to manage the use of single occupancy vehicles and associated parking provision in a way that encourages public transport use, prioritises pedestrian amenity and distributes parking equitably across the campus.

The intent is not to remove peoples' ability to drive to Curtin, penalise those who lack realistic travel alternatives or to simply revenue raise. The key objectives for parking supply and management at Curtin are to:

- Reflect leading practice in other activity centres locally;
- Acknowledge that Perth's population is growing and traffic and parking demands on and around Curtin will increase;
- Provide parking that meets the diverse needs of visitors to the University (from short term to all day and out-of-hours access);
- To be financially, socially and environmentally sustainable; and
- Continue to reinvest parking revenue into sustainable transport options.

5.0 STRATEGIC PROJECTS

STRATEGIC PROJECTS

The strategic projects contained within the Plan respond to the needs of the University community as well as the objectives of the suite of documents which will shape the planning, operations and maintenance of the Campus now and in the future, including the Greater Curtin Masterplan, Green Star Communities and the Bentley Campus Environmental Risk Management Plan.

NEEDS ASSESSMENT

The focus of the Plan in the short to medium team is to address the immediate needs of the University community. In August 2016 the University community were invited to provide comment on transport and movement at the Bentley campus. Key issues for the University community, in order of magnitude of concern, included:

- Public transport services are not frequent enough, do not serve all areas well and do not feel safe for patrons travelling alone, particularly at night;
- Bicycle and pedestrian routes to and from campus are poorly connected and not legible;
- End-of-trip facilities are of poor quality. While the Bike Pods are a good initiative, the shower facilities are very poor and that lockers would be useful at these locations; and
- Vehicles searching for available parking bays causing significant congestion, delays, unnecessary fuel consumption and stress.

A summary of the outcomes of the community consultation is provided in Appendix B.

Utilising the feedback gathered from the community a needs assessment was undertaken (as contained in Appendix C) and a total of twelve strategic projects identified.

The twelve strategic projects were categorised into four key areas of focus:

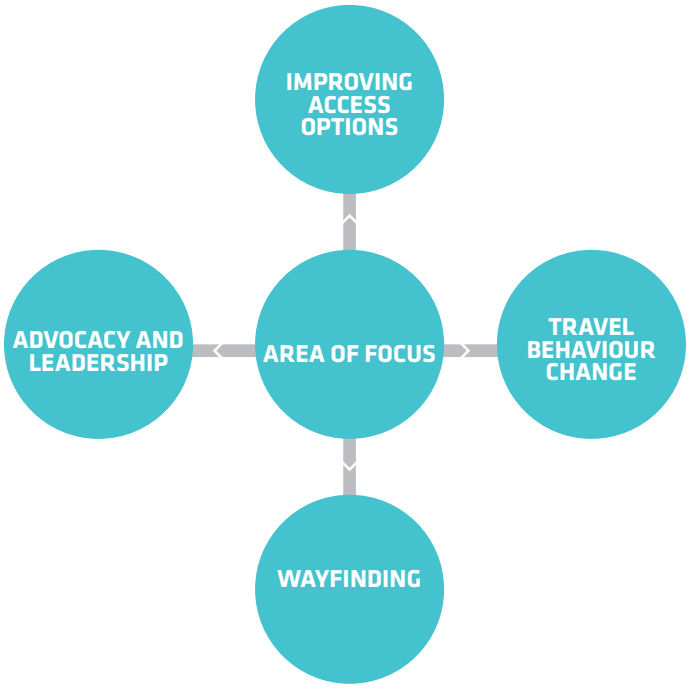


Figure 4/ Transport and movement area of focus

PROJECT PRIORITISATION

It is an objective of the Plan to prioritise projects which create value and meet the needs of the University community. Deciding how to prioritise and separate high priority projects from lower priority projects can be challenging.

In response to this the University developed a Project Prioritisation Framework which provides a structured approach in achieving consensus and balancing the needs of the University's community. The framework provides a means for ranking projects taking into account project criticality, based on the University's risk matrix as well as the University's approach to transport and movement (As contained in Appendix D).

It is recognised that due to changes in internal or external conditions additional projects may be requested by the University community that are not identified as a current priority within the Plan. As such any projects not listed within the Plan shall be assessed using the Project Prioritisation Framework.

PROJECT COORDINATION & INTEGRATION

Key to providing an integrated approach to transport and movement is ensuring projects are not developed in in isolation. The strategic projects identified within the Plan, and all future projects, need to take into account the wider campus precinct and integrate into the existing transport and movement network. For instance, the installation of an end of trip facility needs to consider the connections to and from the facility to ensure it links in to the wider bicycle network.

IMPROVING ACCESS OPTIONS

Cycle Network Capital Works Implementation Programme

STAGE 1: DETERMINE EXTENT OF CAPITAL WORK INVESTMENT

In 2015 the University undertook a review of existing deficiencies in the cycle network (as highlighted in Figure 5). Some time has elapsed since this review. The University shall undertake review of the existing data available and undertake consultation with the Town of Victoria Park, Department of Transport and Curtin officers (PF&D Capital Works and PF&D Operations and Maintenance) to identify any changes to the cycling infrastructure/environment since the review was undertaken.

Through this review the university shall determine the likely extent of capital work required to:

- Construct missing links including last metre connections between perimeter paths and cycle parking/end of trip facilities; and
- Upgrade paths to meet design standards including consistency of surface materials.

PRIORITY
1
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
Q1 2017
COST
$10,000

STAGE 2: DEVELOP CYCLE NETWORK CAPITAL WORKS IMPLEMENTATION PROGRAMME

The University shall establish a capital works implementation programme to address deficiencies in the existing cycle path network as identified in Stage 1.

The implementation program shall prioritise works which relate to existing or proposed major end of trip facilities such as the Creative Quarter Cycle Hub and the Cycle Hub located in Building 410 (as shown in Figure 5) .

The development of the cycle network implementation programme shall be undertaken in conjunction with the development of the pedestrian network implementation programme in order to identify works that can be integrated to benefit both pedestrians and cyclists.

PRIORITY
1
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
Q2 2017
COST
TBC in Stage 1

STAGE 3: IMPLEMENT CAPITAL WORKS PROGRAMME

PRIORITY
1
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
Q3 2017
COST
TBC in Stage 2

Figure 5/ Cycle infrastructure

Pedestrian Network Improvement Plan

STAGE 1: DEVELOP PEDESTRIAN NETWORK AUDIT

The University shall undertake an audit of the campus, including the campus car parks and areas outside of the Academic Core, to identify deficiencies in the existing footpath network. The audit will identify:

- Missing links, including connections to the perimeter footpath network, buildings and public transport facilities;
- Insufficient lighting and natural surveillance;
- Insufficient shading and weather protection
- Legibility; and
- Poor surfacing.

The development of the pedestrian network implementation programme shall be undertaken in conjunction with the development of the cycle network implementation programme in order to identify works that can be integrated to benefit both pedestrians and cyclists.

PRIORITY
1
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
Q1 2017
COST
$15,000

STAGE 2: DEVELOP CAPITAL WORKS IMPLEMENTATION PROGRAMME

The University shall establish a capital works implementation programme to address deficiencies in the existing pedestrian network as identified in Stage 1. The programme will prioritise projects which improve major pedestrian as identified within Figure 6.

PRIORITY
1
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
Q2 2017
COST
TBC in Stage 1

STAGE 3: IMPLEMENT CAPITAL WORKS PROGRAMME

The University shall implement the capital works program as identified in Stage 2.

PRIORITY
1
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
2018
COST
NA

Fleet Car Strategy

DEVELOP A BENTLEY CAMPUS FLEET CAR STRATEGY

Four fleet vehicles are currently available to staff and students for business and leisure travel. The operation and maintenance of this service is currently outsourced to an external car rental provider. To support the use of fleet vehicles going forward the University shall develop a Fleet Car Strategy which will establish Curtin's fleet car objectives, policy, and management protocols.

PRIORITY
2
RESPONSIBILITY
PF&D Operations & Maintenance
IMPLEMENTATION DATE
2018
COST
NA

INVESTIGATE PROVISION OF DEDICATED CARPOOLING BAYS

The University shall investigate the opportunities for providing dedicated carpooling bays located in convenient locations within the existing campus car parks. The investigation shall consider enforcement in the context of the current car parking enforcement regime.

PRIORITY
2
RESPONSIBILITY
PF&D Operations & Maintenance
IMPLEMENTATION DATE
2018
COST
NA

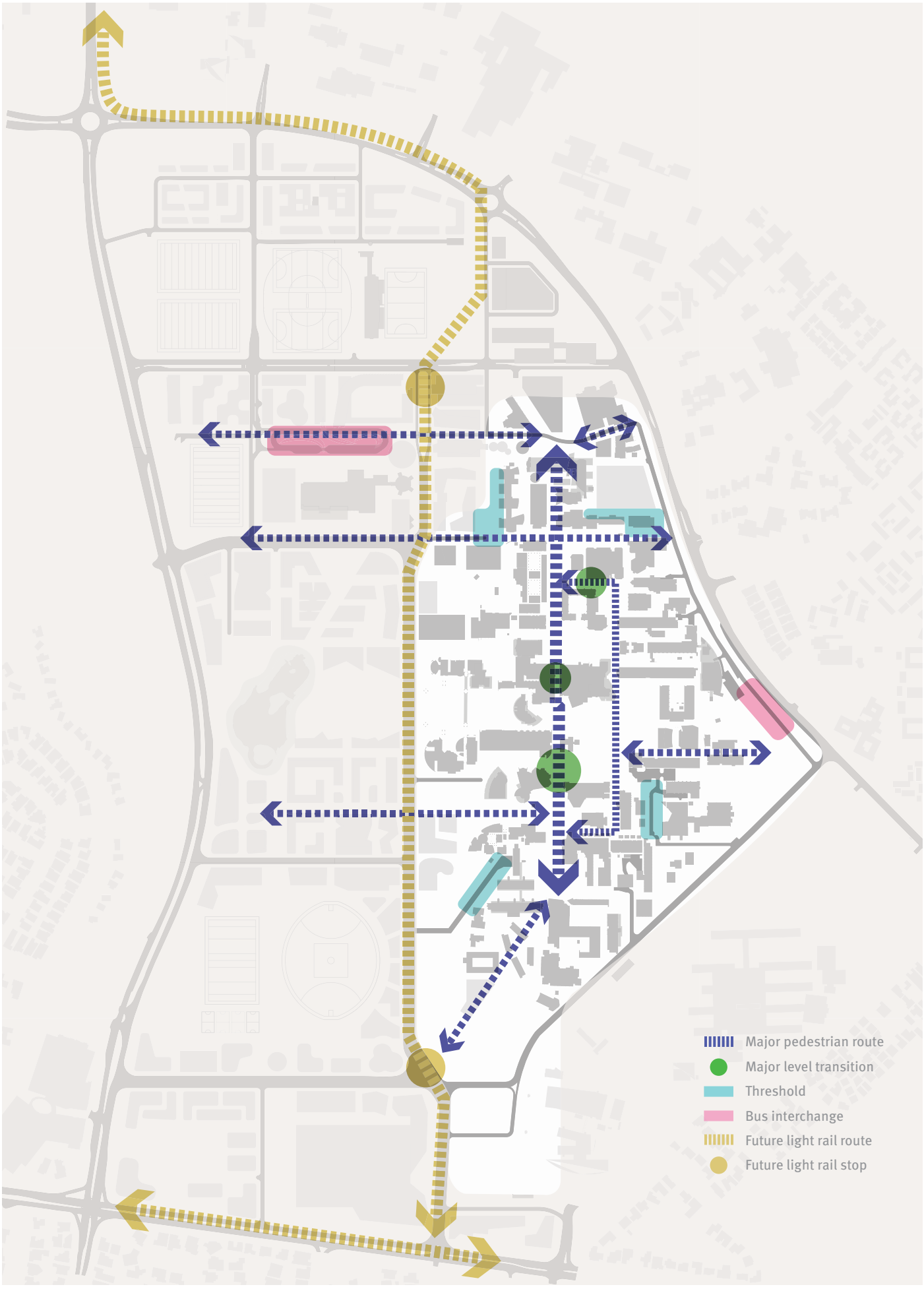


Figure 6/ Pedestrian movement network

TRAVEL BEHAVIOUR CHANGE

Bypass Programme relaunch

RELAUNCH BYPASS PROGRAMME

In 2015 the University developed the Bypass Programme, a travel behaviour change programme. To date only a small number of initiatives have been implemented including cycle and footpath decals.

The University shall work towards relaunching and rolling out the full Bypass campaign which will include an ongoing resource to ensure the ongoing implementation of the programme.

PRIORITY
1

RESPONSIBILITY
PF&D Operations & Maintenance

IMPLEMENTATION DATE
2017

COST
$20,000

Promoting active lifestyles

DEVELOP AND RUN ACTIVE LIFESTYLES EVENTS AND PROMOTION

The University shall continue to deliver a programme of events and investigate opportunities to tie in with other State Government initiatives such as Walk Over October. Events to include:

- Bike Week;
- Ride to Work breakfast;
- Bike Doctor bike maintenance sessions; and
- World Parking Day.

PRIORITY
2

RESPONSIBILITY
PF&D Operations & Maintenance
PF&D Development

IMPLEMENTATION DATE
Ongoing

COST
$10,000 pa

Promoting public transport

DEVELOP AND RUN PUBLIC TRANSPORT EVENTS AND PROMOTION

A programme of initiatives to promote travel by public transport shall be considered including:

- Public transport awareness events including the CABs buses and availability of the EDOE campus transport tracking application and events linked to the opening of major new public transport infrastructure including the Bus Interchange;
- Discounted preloaded Smartrider cards;
- Bus branding;
- Public transport information provided to all new staff and students; and
- Personal safety awareness training.

PRIORITY
3

RESPONSIBILITY
PF&D Operations & Maintenance
PF&D Development

IMPLEMENTATION DATE
Ongoing

COST
$5,000pa

Promoting carpooling

DEVELOP AND RUN CARPOOLING EVENTS AND PROMOTION

Carpooling offers a viable option for those staff and students who do not live within walking or cycling distance of the campus and also have limited public transport options.

The university shall host regular carpooling promotional events in order to

- Promote the benefits of carpooling;
- To promote the facilities offered by the Curtin to facilitate carpooling including the provision of dedicated carpooling bays and ride matching service;
- Safety awareness; and
- To provide staff with an opportunity to meet and greet potential ride sharers.

PRIORITY
4

RESPONSIBILITY
PF&D Operations & Maintenance

IMPLEMENTATION DATE
Ongoing

COST
$5,000pa

WAYFINDING

Campus wayfinding strategy

DEVELOP A CAMPUS WAYFINDING STRATEGY
The University shall develop a Bentley campus Wayfinding Strategy. The Strategy shall be captured within the Curtin Guidelines document package, available to developers, designers, planners and the many facets of our lifecycle Asset Management team.

The Strategy shall guide many principles, from campus planning to signage. Physical signage, will still be managed by the existing requirements and documentation, with the strategy providing 'higher level' guidance information.

PRIORITY
1
RESPONSIBILITY
PF&D Planning
IMPLEMENTATION DATE
2017
COST
$175,000

Smart parking technology

SMART PARKING TECHNOLOGY
The University shall install Smart parking technology which will monitor and communicate parking bay availability to our community.

A trial is programmed for February 2017. If successful the technology will be rolled out across the University during 2017/2018.

PRIORITY
2
RESPONSIBILITY
PF&D Capital Projects
IMPLEMENTATION DATE
2017
COST
$150,000

ADVOCACY AND LEADERSHIP

Advocate for improved public transport

ADVOCATE FOR IMPROVED PUBLIC TRANSPORT FACILITIES
The University shall undertake a leadership role in advocating to State Government for improvements to the wider public transport network including access to the Bentley campus.

PRIORITY
1
RESPONSIBILITY
PF&D Operations & Maintenance
IMPLEMENTATION DATE
Ongoing
COST
NA

Advocate for improved cycling facilities

ADVOCATE FOR IMPROVED REGIONAL CYCLING FACILITIES
The University shall advocate to the City of South Perth and City of Victoria Park for improved cycle connections linking to the Bentley campus, including upgrade on the Manning Street shared path which is currently of poor quality.

PRIORITY
1
RESPONSIBILITY
PF&D Operations & Maintenance
IMPLEMENTATION DATE
Ongoing
COST
NA


THERE IS NO
JOY IN
POSSESSION
WITHOUT
SHARING.
Erasmus

6.0 EVALUATION & REPORTING

EVALUATION AND REPORTING

Crucial to the success of the Plan is a schedule of regular evaluation against key performance indicators. This will ensure it remains relevant and continues to deliver the vision for transport and movement at the Bentley campus.

The University shall review the Plan at two and three year intervals in line with the implementation timeline as shown in Figure 7.

A key element of the review will be assessing the need to update the Plan to include additional strategic projects, or to progress the existing strategic projects further.

KEY PERFORMANCE INDICATORS

The Plan will be evaluated against the overall purpose of the Plan, specifically:

- Reducing reliance on access by private vehicles;
- Facilitating active lifestyles; and
- Reducing transport related carbon emissions.

The University currently collects a range of data for the various modes of transport serving the Campus. The success of the Plan will be measured against existing baseline data.

The key performance indicators used to measure the success of the Plan are detailed below in Table 1.

ANNUAL REPORTING

The implementation of the Plan will be reported on annually. The Annual Report with include:

- Key performance indicator monitor, evaluation and review outcomes;
- Proposed amendments to the Plan;
- Projects delivered in financial year;
- Planned projects following financial year; and
- List of received transport and access related complaints, suggestions and identified opportunities.

Table 1/ Key Performance Indicators

PURPOSE	PERFORMANCE INDICATOR	METRIC	DATA	2016 BASELINE NOTE TO BE USDPATED PRIOR TO PUBLICATION
Reduced reliance on access by private vehicle to and from campus Facilitating active lifestyles	Increase in use of public transport to and from campus	Proportion of University community using public transport to access the campus	Mode share	19.8%[1]
		Number of public transport patrons alighting at bus stops serving Bentley campus	Smartrider	1,109,177 alighting's per annum[2]
	Increase in campus buses to and from campus	Proportion of University community using campus buses to access the campus	Campus bus patronage	139,297 passengers per annum[3]
	Increase in carpooling to and from campus	Proportion of University community car pooling to access the campus	Mode share survey	5.2% 1
		Utilisation of Curtin ride match service	Annual enrollments	171[4]
	Increase in cycling to and from campus	Proportion of University community cycling to the campus	Mode share survey	12.7%1
		Bike pod usage	Bike pod swipe card	TBC
	Increase in walking to and from campus	Proportion of University community walking to the campus	Mode share survey	5.2%[1]
Reduced carbon emissions relating to transport to and from campus	Reduction in total vehicle kilometers	Proportion of University community driving to the campus alone	Mode share	45.5%[1]
		Proportion of University community using public transport and campus buses to access the campus	Mode share	24.8% [1]
		Distance travelled to campus from home location	Journey distance	TBC Baseline data to be collected within six months of plan implementation

[1] Arup (2016). Bentley Campus mode share survey. Perth: Curtin University

[2] Public Transport Authority (2016) Curtin University - Total boardings and alightings all day types. Perth: Public Transport Authority

[3] Horizons West Bus & Coachlines (2016). Annual CABS passenger statistics 2010 to 2016. Perth: Horizons West Bus & Coachlines

[4] My Carpools (2016). 'My Carpools' users 2015 – 2016. Perth: MyCarpools

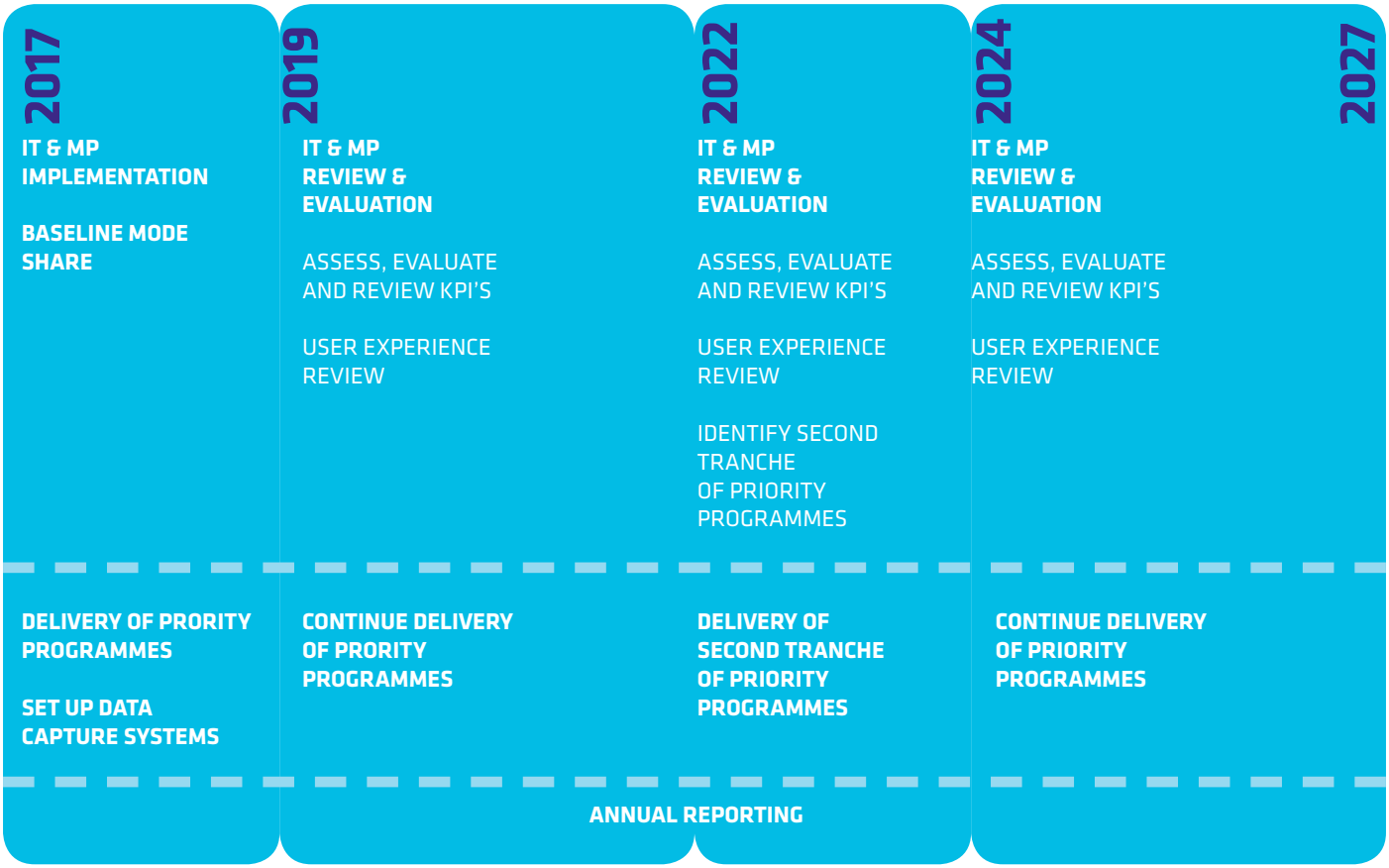


Figure 7/ Evaluation and Review Implementation

7.0 APPENDICES

APPENDIX A

TRANSPORT AND MOVEMENT AT CURTIN TODAY

A1 Transport and Movement at Bentley Campus Today

The Curtin University Bentley Campus is accessible by a range of modes including private vehicle, public transport, foot and bicycle. The quality and level of service of these modes varies however. At present the majority of staff drive alone, utilising large areas of staff, student and visitor parking surrounding the academic core of the campus. In 2016 a snap shot survey of mode used to access the Campus demonstrated that 45.5% drive lone, whilst only 19.8% used public transport and 5% used the free campus buses. Whilst only representing a small proportion of the total mode share the campus buses have seen a dramatic increase in patronage over the past six years, with annual passenger numbers increasing from 71,959 to 139,297 between 2010 and 2016.

Table A1: Bentley Campus Mode Share (2016)

MODE	MODE SHARE
Walk	5.2%
Bike	12.7%
Campus Bus	5.0%
Public Transport	19.8%
Motorbike/Scooter	1.7%
Dropped Off	1.1%
Car (driver alone)	45.5%
Car (with another Curtin student or staff member)	5.2%
Other	3.9%
Total	100%

Whilst access by car currently dominates trips to and from the University, the Academic Core located with the heart of campus is accessible only to pedestrians and bicycles during normal semester operation. Vehicle access is restricted to off-peak times only.

CURRENT PROJECTS AND INITIATIVES

A number of major projects that are shaping the way the community accesses and moves through the campus, notably:

- The development of a Vehicle Access Management Plan which has informed the delivery of a pedestrianised Academic Core plus the creation of pedestrian-centric shared spaces;
- A centralised bus hub integrated into the Greater Curtin North neighbourhood which will dramatically increase the visibility of public transport within the campus;
- A major end of trip facility located within the Creative Quarter precinct;
- A new east west access road between Hayman Road and Kent Street;
- A major audit of existing shared path project which has led to the delivery of a network of shared path facilities;
- Student house car share scheme;
- Subsidised Transperth bus services including routes 100 and 101 which provide frequent services to Canning Bridge Railway Station; and
- Dedicated freely accessible Curtin buses which service the surrounding areas including Technology Park.

[1] Arup (2016). Bentley Campus mode share survey. Perth: Curtin University

APPENDIX B

COMMUNITY CONSULTATION

B1 Community Consultation

In August 2016 the University community were invited to provide comment on transport and movement at the Bentley campus. Using an online tool, staff, student and visitors were asked to comment on:

- Their current experiences in accessing the University campus;
- The user hierarchy which forms part of the University's approach and philosophy to transport and movement; and
- The types of projects the University should focus on in the future.

A total of 656 responses were received.

CURRENT USER EXPERIENCE

Lack of mobility choice was a key concern on the University community. Those who currently drive to Curtin alone don't necessarily want to use their car on a daily basis, however the relative convenience of driving, out of hours activities and commitments (including childcare), poor public transport coverage, and safety concerns prevent them from considering other modes.

Other key issues for the University community, in order to concern, included:

- Public transport services are not frequent enough, do not serve all areas well and do not feel safe for patrons travelling alone, particularly at night;
- Bicycle and pedestrian routes to and from campus are poorly connected and not legible;
- End-of-trip facilities are of poor quality. While the Bike Pods are a good initiative, the shower facilities are very poor and that lockers would be useful at these locations; and
- Vehicles searching for available parking bays causing significant congestion, delays, unnecessary fuel consumption and stress.

TRANSPORT AND MOVEMENT HIERARCHY

Respondents were asked if they agreed with the Transport and Movement Hierarchy, to which 52.6% said "Yes", 29.7% said "No" and 17.7% replied that they were undecided. When respondents were prompted to answer why they answered the way they did, the following trends appeared:

- 44% of respondents brought up the notion that while the hierarchy may be good in principle, single-occupancy vehicles are the only practical way for them to get to Curtin. This is for a variety of reasons:
  - Residing too far from Curtin to walk/ cycle, in locations not well served by public transport
  - Trip-chaining requirements; especially involving picking up/ dropping off children or part-time work
- 8.5% of respondents suggested that motorcycles and scooters should be higher in the hierarchy, given their fuel efficiency and minimal space requirements.

FUTURE PROJECT PRIORITIES

Out of a list of eleven future project ideas, respondents were asked to select up to three projects which they would like the University to focus on in the future. More frequent public transport services was selected the most, by 209 of all respondents, followed by live car parking bay availability information (selected by 167 respondents).

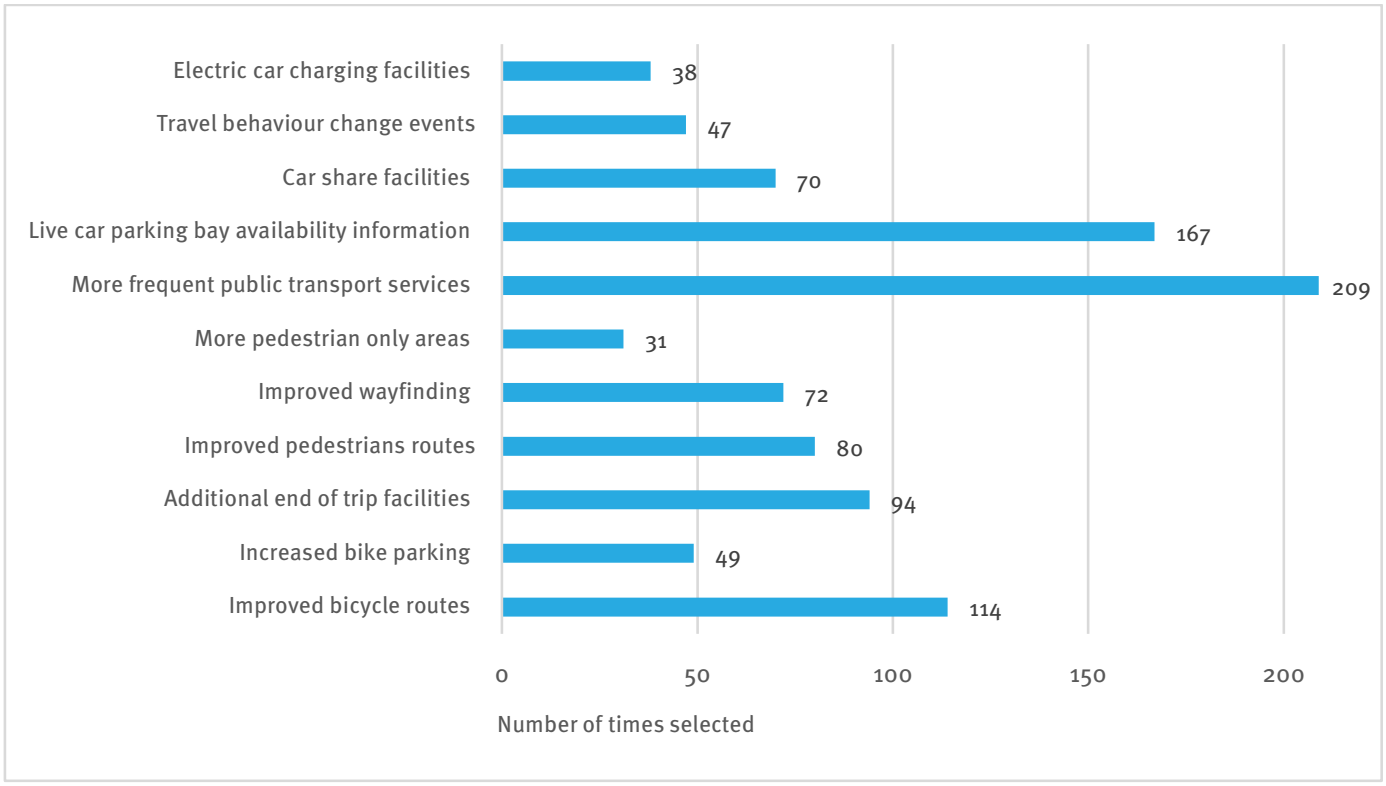


Figure A1/ Future Projects

APPENDIX C

NEEDS ASSESSMENT

C1 Needs Assessment

The focus of the Plan in the short to medium team is to address the immediate needs of the University community. Utilising the feedback gathered from the University community we have identified a range of transport solutions which will form the focus of strategic projects going forward.

The table below summarises the key issues for the campus and focus of future projects to be delivered by the University to address them.

Table C1 Needs Assessment

AREA OF CONCERN	KEY ISSUES	MITIGATION MEASURES
Public transport	• Lack of frequency • Personal safety concerns • Areas of Perth poorly served by public transport • Inconvenient due to day time and out of hours activities and commitments	• Public transport awareness and promotion • Advocating for improved public transport frequency and coverage • Alternative modes for areas poorly served by public transport including dedicated campus buses or car pooling • Salary packaging public transport fares for staff • Fleet cars and car share for travel commitments during the day, reducing the need for a private vehicle onsite
Walking and cycling	• Poor connections to and from campus • Poor legibility • Poor quality end of trip facilities	• Prioritise delivering the Cycle Access Management Plan • Improve wayfinding • Upgrade end of trip facilities • Delivering Universal Access
Vehicle access	• Lack of information regarding available parking provision • Vehicles circulating causing congestion and impacting pedestrian movements	• Implement car park availably wayfinding technology

APPENDIX D

PROJECT PRIORITISATION FRAMEWORK

				Improving Access Option				Travel Behavior Change						Advocacy	
Weighting	Category	Priority	Criteria	works implementation programme	Pedestrian Network Improvement Plan	Dedicated car pooling bays	Fleet car strategy	Bypass Programme relaunch	Promoting Public Transport	Promoting Car Pooling	Promoting Active Lifestyles	Wayfinding Strategy	Smart Parking	Advocacy Cycling	Advocacy Public Transport
PRINCIPLE CATEGORIES															
		3.00	Pedestrians		y			y			y	y			
		3.00	Cyclists	y				y			y	y		y	
		3.00	Public Transport					y	y			y			y
		3.00	Campus buses					y	y			y			
		2.00	Carpooling			y	y	y		y					
	Movement	1.00	Motorcycles and Scooters					y							
1.00	Hierarchy	0.00	SOV				y						y		
		Score		0.429	0.429	0.286	0.286	2.143	0.857	0.286	0.857	1.714	0.000	0.429	0.429
		3.00	Providing choice	y	y	y	y								
	Transport	2.00	Communicating choice					y	y	y	y				
1.00	Choice	2.00	Informed choice					y	y	y	y		y		
		Score		1.000	1.000	1.000	1.000	1.333	1.333	1.333	1.333	0.000	0.667	0.000	0.000
		2.00	Active lifestyle communication					y			y				
	Active	1.00	Links to sports and recreation	y	y										
1.00	Lifestyles	3.00	Facilitating active transport	y	y							y			
		Score		1.333	1.333	0.000	0.000	0.667	0.000	0.000	0.667	1.000	0.000	0.000	0.000
1.00	High priority														
2.00	Medium Priority														
3.00	Low Priority			2.762	2.762	1.286	1.286	4.143	2.190	1.619	2.857	2.714	0.667	0.429	0.429
				1	1	2	2	1	3	4	2	1	2	1	1

PEDESTRIANS/
Does the project provide positive outcomes for pedestrians?

CYCLISTS/
Does the project provide positive outcomes for cyclists?

PUBLIC TRANSPORT/
Does the project provide positive outcomes for public transport?

CAMPUS BUSES/
Does the project facilitate access for campus buses?

CARPOOLING/
Does the project provide positive outcomes for car sharing and car pooling?

MOTORCYCLES AND SCOOTERS/
Does the project provide positive outcomes for access by motorcycle/ scooter?

SINGLE OCCUPANCY VEHICLES/
Does the project provide positive outcomes for access by single occupancy vehicles?

PROVIDING CHOICE/
Provide the University community with a range of transport options whilst respecting the University's transport and movement hierarchy

COMMUNICATING CHOICE/
Communicate the transport options available in a coherent and engaging manner

INFORMED CHOICE/
Provide mechanism to allow the University community to make more informed transport decisions

ACTIVE LIFESTYLE COMMUNICATION/
Does the project communicate and promote the benefits of walking and cycling as part of an active lifestyle ?

LINKS TO SPORTS AND RECREATION/
Does the project enhance access to sports and recreation activities?

FACILITATING ACTIVE TRANSPORT/
Does the project provide a pedestrian and cycle network supported by quality end-of-trip facilities that promotes and encourages active transport?

APPENDIX E

THE FUTURE OF TRANSPORT

E1 The Future of Transport

The way people move around cities, suburbs and campuses has always been shaped by technology, but today transport technology is evolving faster than ever.

The future is not just about building more efficient transport networks – it is about using new technologies and service models to change the way people move and interact with their environment.

This change has already begun. How do we respond? How do we plan for unknowns? How do we ensure infrastructure is adaptable to the future?

The Plan covers a period of over 10 years. As such there is a need to ensure future projects respond to changes to the external transport context in order to retain Curtin's position as a modern and relevant institute.

The principles for the future of mobility to be considered by future projects at the University are addressed below.

FUTURE OF MOBILITY	CAMPUS APPLICATION	
	CAR PARKING	WAYFINDING
ADAPTABILITY OF INFRASTRUCTURE New infrastructure should be built in such a way that it can adapt to changing future needs	The imminent arrival of autonomous vehicles may reduce the demand for parking dramatically, and increase demand for kerb-side pick-up/ drop-off spaces. Parking wayfinding technology must also adapt to be compatible with these autonomous vehicles. This highlights the need for new parking infrastructure to be easily and economically adaptable to changes in demand	

FUTURE OF MOBILITY	CAMPUS APPLICATION	
	CAR PARKING	WAYFINDING
INNOVATION BY EXPERIMENTATION Curtin's strong innovation identity should be kept at the core of project decision-making. This is achieved by being the early adopters of new technology/ systems/ ideas, trialling unique solutions and encouraging student contribution and feedback	A myriad of smart parking solutions are becoming available as access to data increases. Significant opportunity exists to trial new and innovative parking solutions, laying the groundwork for a system compatible with driverless vehicles and other integration in the future and providing international publicity for Curtin	Universities are ideal environments to trial new wayfinding solutions due to the unique environment provided by a campus. Navigating can be difficult, particularly for first-timers. Experimenting with wayfinding solutions can improve this experience drastically; a crucial edge in the competitive education sector
PROMOTE SHARING WHEREVER POSSIBLE Sharing improves sustainability, collaboration, innovation and efficiency. Projects should be delivered in such a way that the potential for sharing is maximised		
ENABLE CONNECTION TO/ OPEN SHARING OF DATA Integrating valuable university-collected data with the Curtin experience by allowing students to "plug in" and access, manipulate and share certain datasets leads to significant innovation and collaboration opportunities	Improvements in the quality and accessibility of data lead to an increasingly efficient and personalised parking solution. Enabling a higher level of access creates a cycle of improvement. Implementing a system where this is possible therefore becomes a priority	
PERSONALISED, NOT UNIVERSAL People increasingly want options specifically tailored to their needs. Services should therefore be segmented in order to respond more directly to improving the user experience	"Circling" for parking is a significant cause of traffic, emissions, frustration and lateness to class. Providing a parking service which provides personalised information to users, guiding them to the best bays in the most efficient manner effectively solves this problem. Happiness, productivity and pre-lecture coffee sales increase accordingly	Digital signage and directions can be tailored to individual passers-by or according to the time of day, special events and to provide news updates. These dynamically changing signs can guide an individual to their destination while providing them with unique messages relevant to their interests and purpose for being on campus
CONSIDER THE CONNECTION TO/ BETWEEN PEOPLE AND THEIR PERSONAL DEVICES Personal devices such as smart phones are the link between people, other people, services, infrastructure and anything connected to the internet. Curtin can maximise safety, comfort and convenience by placing this connection at the forefront of project planning	Smart phones are a great enabler of the personalisation described above. An example could be a smart phone signalling that a student has arrived and is searching for a space. Personalised directions appear on the sign in front of them, guiding them towards the available bay nearest their next class	By integrating personal devices with dynamic digital wayfinding, a university can provide a far higher level of customised service and make an individual feel like they are being dealt with on a personal level

FUTURE OF MOBILITY	CAMPUS APPLICATION	
	SELF-DRIVING SHUTTLE BUS	SHARED MOBILITY-ON-DEMAND SERVICE
ADAPTABILITY OF INFRASTRUCTURE New infrastructure should be built in such a way that it can adapt to changing future needs	Pop-up bus stops may provide an efficient dynamic option for a self-driving campus shuttle. These enable dynamic demand-responsive routing in collaboration with the shuttle, and disappear when not in use allowing the space to be used for other purposes	
INNOVATION BY EXPERIMENTATION Curtin's strong innovation identity should be kept at the core of project decision-making. This is achieved by being the early adopters of new technology/ systems/ ideas, trialling unique solutions and encouraging student contribution and feedback	Similarly to wayfinding, the university environment is ideal for the early adoption of driverless vehicle technology, possibly in the form of a shuttle bus. This would be most useful for last-mile and long walks, and allow for increased frequency, including during off-peak periods. Trialling such technology would enable on-demand service provision to be trialled concurrently, along with many other possibilities	The notion of Mobility as a Service (MaaS) is a relatively new one. Implementing it would present significant opportunity to connect the campus with surrounding land uses while contributing to the innovation identity of Curtin
PROMOTE SHARING WHEREVER POSSIBLE Sharing improves sustainability, collaboration, innovation and efficiency. Projects should be delivered in such a way that the potential for sharing is maximised	A self-driving shuttle bus fits neatly into the theme of sharing transport to, from or around university. Such a solution not only brings people physically together but also provides a talking point and becomes a feature	The most significant barriers to a shared MaaS solution have traditionally been data and linking people instantly. These issues are now mostly solved, and sharing is on the rise. Vehicle, ride and bike sharing as part of an integrated service with public transport provide significant potential in a university context
ENABLE CONNECTION TO/ OPEN SHARING OF DATA Integrating valuable university-collected data with the Curtin experience by allowing students to "plug in" and access, manipulate and share certain datasets leads to significant innovation and collaboration opportunities		Opening up access to data surrounding a shared mobility-on-demand service via personal devices and vehicle/ride stations not only improve awareness of the service but also provide scope for innovation and improvement

FUTURE OF MOBILITY	CAMPUS APPLICATION	
	SELF-DRIVING SHUTTLE BUS	SHARED MOBILITY-ON-DEMAND SERVICE
PERSONALISED, NOT UNIVERSAL People increasingly want options specifically tailored to their needs. Services should therefore be segmented in order to respond more directly to improving the user experience	Despite the traditional notion of a bus as being public transport, it can also act as a personalised service. Users could receive notifications of friends or people in common on social media on board, updated about campus news and events or even dropped at their car/ student housing via the GPS coordinates saved in a parking app	MaaS allows people to choose from personally tailored transport options, streamlining and optimising the process of travel to, from and around university. By optimising safety, comfort and convenience, the student (or staff) experience is vastly improved and the reputation of the university as a place to study, work and live benefits
CONSIDER THE CONNECTION TO/ BETWEEN PEOPLE AND THEIR PERSONAL DEVICES Personal devices such as smart phones are the link between people, other people, services, infrastructure and anything connected to the internet. Curtin can maximise safety, comfort and convenience by placing this connection at the forefront of project planning	Smart phones provide the medium to achieve the above level of personalisation. By prioritising the integration with smart phones and therefore the humans attached to them, Curtin can bring people together and get them safely and efficiently to where they want to go	Personal devices provide the core of a mobility-on-demand service. Ease of use, appropriate integration and seamless operation are critical components