



# Get a Move On!

*A landmark report to get Perth moving*

November 2016



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## From the Chairman

Over the past decade, the Perth and Peel region has experienced unprecedented growth as we transitioned from a small to a mid-sized city. While there have been a number of benefits as a result of this, we have also experienced growing pains along the way, especially when it comes to commuting around Perth.

The *Get a Move On!* study was launched amid predictions that Perth will have 7 of the 10 most congested roads in Australia and congestion will cost the economy more than \$5.7 billion by 2031.

The year-long project, the first of its kind, was based on the premise that planning for Perth's future mobility is not just government's problem, it's everyone's. The efficiency and effectiveness of Perth's multi-modal transport system will impact on all Perth residents and businesses – and therefore residents and businesses must also be central to the solution.

That's why as part of the research, commuters and businesses were surveyed about what kind of practical, multi-modal transport system they wanted for Perth and Peel. Like me, I'm sure you'll find some of the responses quite surprising.

The project also examined alternative funding methods for transport and infrastructure projects, innovative technology and ways that changes in movement patterns, attitudes and behaviour can be encouraged to reduce the stress on our transport network.

The *Get a Move On!* report is squarely aimed at changing policy and delivering a more mobile future for Perth. This has been achieved through comprehensive research that has produced an irrefutable and sophisticated body of evidence that defines and quantifies the impacts of reduced mobility on the Perth and Peel region. The research should inform and guide new transport initiatives for years to come.

There is no doubt that some of the recommendations will be seen as controversial but the Committee does not resile from them. The fact-based findings within this report pointed towards obvious solutions.

The past year has been an interesting journey. We have learnt a lot about Perth and its transport issues and the solutions to them. I hope that this report and its 10 recommendations are earnestly examined and considered so that decisions are made to ensure that the Perth and Peel region has a sustainable transport future.

A handwritten signature in black ink, appearing to read 'John Langoulant'.

John Langoulant AO  
Chairman, Committee for Perth





## From the Project Director

*Get a Move On!* has been a year-long project that has taken us on a journey to better understand commuting habits in Perth. Since the 1955 Hepburn and Stephenson Plan, the region has been growing. It has largely become a sprawling, low-density metropolis in which car is king.

While Perth is the 7th most liveable city on the planet, we have now arrived at a crossroads where we have to decide if Perth's past is also its future.

When we started this project, the region did not have a transport plan and since then a draft transport plan for Perth has been prepared. It is ambitious but lacks bi-partisan support, funding and timeframes and therefore puts at risk its chance of ever being implemented.

The Committee for Perth has a history of preparing landmark reports on seemingly intractable issues. Our approach in undertaking *Get a Move On!*, the same as any of our major projects, puts people at the heart of the issue and this has resulted in a report that is 'by Perth for Perth' and helps to shape the future of the region.

Interestingly, what a difference a decade makes. If we had undertaken this study at the start of the boom there is no doubt it would have contained an extensive list of projects. In the downturn however, investment is still needed so any dollars spent must be in the right place, at the right time and for the right reasons.

*Get a Move On!* contains 10 recommendations and 33 actions that are bold and transformational to set Perth on a course for an efficient, multi-modal transport future.

It is clear from our research that the people of Perth overwhelmingly support the need for greater commuting options and that the priority areas are in the CBD and its surrounds along with major centres of employment throughout the region.

Behind the recommendations are 10 discrete research projects detailed in the chapters that follow, with contributions from our own internal research team as well as academics from Curtin University, The University of Western Australia as well as Plymouth University in the UK.

In order for people to be at the heart of this report, a large scale commuter survey was undertaken, as well as a series of one-on-one interviews with businesses across the region. It also has the benefit of the learnings from a number of on-the-ground study tours I have undertaken both in Australia and overseas.

If the recommendations are implemented in their entirety, Perth will have a vibrant city and urban areas where more people could live, work and play, and move between activities using public and active transport. Regional centres would be strengthened and become focal points for increased employment and higher-density living options. Importantly, our suburbs would remain largely unchanged, family-friendly neighbourhoods.

*Get a Move On!* would not have been possible without the support of core funder RAC, major funders AECOM, ANZ and the City of Subiaco and supporting funders Ipsos, UWA, Finbar and HASSELL.

The project has been overseen by a cross-sectoral, multi-disciplinary, gender-balanced project Steering Committee formed from our funding partners. I can't thank them enough for their financial and intellectual support.

We have done a back-breaking amount of work and taken a fresh, people-focused approach to come up with a set of recommendations that are workable solutions for the next 20 years. It is now up to the two major political parties to commit to a public transport future to get the region moving!

A handwritten signature in black ink, appearing to read 'Marion Fulker'.

Marion Fulker  
CEO, Committee for Perth  
Project Director, *Get a Move On!*  
Adjunct Senior Research Fellow, UWA

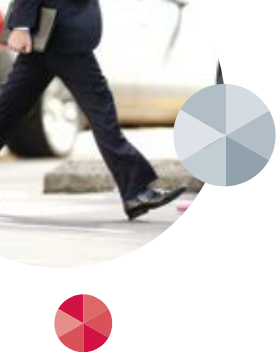
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## Executive Summary

Mobility is central to perceptions of quality of life and liveability in Perth and Peel and over the past decade changes in levels of traffic congestion and public transport use have emerged as key indicators of regional change.

Rapid population and economic expansion in the first decade of the 21st century increased the number of vehicles on regional roads and the number of commuters travelling by public transport, amplifying pressure on the regional movement system.

As a result, the 2012 and 2015 Perth Perceptions Surveys identified traffic congestion and public transport as the primary issue concerning Perth and Peel residents today and of biggest concern for the future (Committee for Perth, 2016).

There have been substantial positive changes in the movement system over the past two decades, with growth in traffic congestion accompanied by increased public transport use and heightened support for investment in public transport rather than in roads (Committee for Perth, 2016). Evidence indicates that behaviour change has primarily been driven by improvements to public transport infrastructure, particularly the opening of the Perth to Mandurah passenger rail line, and heightened congestion delays associated with population growth.

In 2015, the Committee for Perth embarked on *Get a Move On!*, a 12 month, collaborative, in-depth research project that directly responds to ongoing concern regarding traffic congestion and elevated support for public transport investment. The project provides a detailed examination of commuting in Perth and Peel and proposes solutions that are by Perth for Perth.

This report is the combined outcome of ten individual research projects undertaken over a 12 month period. This has included a survey of 2,000 commuters; interviews with 40 major businesses representing 100,000 commuters; the findings of on-the-ground study tours; and desktop research to examine commuting and the co-dependent relationship between land use, transport and economic development.

*Get a Move On!* establishes that commuter movements and mode choice are impacted by:

- Live and work locations;
- The distance that people travel;
- Employment requirements;
- The match between the skills of local residents and the skill-requirements of sub-regional employers; and
- The convenience and cost of driving to specific locations.

The project illustrates that movement in Perth and Peel is inextricably linked with economic development, employment locations and urban form and that this relationship is two-way with economic development, productivity and residential development and also strongly influenced by ease of movement to specific locations.

*Get a Move On!* confirms that in Perth and Peel, the Central sub-region is the most accessible by road and public transport. A majority of employment is located within the Central sub-region and consequently commuters primarily travel from middle and outer suburban locations to inner employment destinations for work.



White collar workers, including managers, clerical and administration and professional service, science and technology workers are most likely to travel to inner locations for work and are also more likely to be public transport users. This is a combined function of accessibility, density and barriers to car use in central locations, such as limited access to free parking and congestion delays.

An additional reason for this is that knowledge, health, professional service, science and technology organisations benefit from central locations that are accessible to skilled workers and enable close interaction and knowledge transfer between clients, service providers, customers and peers. These businesses therefore have a strong preference for central, high-density population locations. Patterns of economic activity and productivity in all Australian cities indicate that, despite long-term policies promoting employment decentralisation, professional service and knowledge sector employment continues to agglomerate in central locations.

*Get a Move On!* has 13 major findings and makes 10 recommendations with 33 actions which aim to deliver a new integrated approach to planning for the economy, land use and transport in Perth and Peel over the next 20 years. It proposes a new integrated hierarchy of employment centres in the region, informed by the capacity of individual locations to accommodate knowledge based employment and high-density residential uses, as well as their level of road reliance and future capacity to attract high frequency public transport users.

Through the report's recommendations and actions, *Get a Move On!* identifies a plan to guide investment to ensure that Perth is a mobile, liveable, vibrant and prosperous region for all.

A summary of the findings and recommendations of the *Get a Move On!* project is provided below.

## Major Finding 1: There is unified support for a public and active transport future.

Perth and Peel is car based, yet people and businesses support a public transport oriented future.



**"An expanded public transport network is crucial to the future of Perth"**

The 2015 Perth Perceptions Survey identified 'efficient public transport' as the *number one* priority for Perth and Peel. The *Get a Move On!* Commuter Survey also revealed that 90% of commuters support investment in new public transport, 85% support making better use of existing infrastructure and 83% support incentives for non-car commuting as a key transport strategy for the region. By contrast, 6 in 10 commuters support road investment.

61% of commuters in Perth and Peel express a preference for public transport or active travel in an ideal world. Train and bicycle are most often preferred. Commuters are drawn to the speed, frequency and reliability of train; and the health benefits and enjoyment of cycling.



**7 in 10 commuters drive to work, yet 9 in 10 support investment in public transport as the transport priority for the region.**

Without commitment to new projects, Infrastructure Australia predicts that 7 of the 10 most congested roads in Australia will be in metropolitan Perth and that the costs of congestion in the region could exceed \$5.7 billion by 2031.





## Major Finding 2:

### Delivering public transport requires commitment and cohesion.

For the past sixty years, the primary focus of regional land use planning has been facilitating orderly, low-density residential growth and high quality road based transport. Delivery of this system has required long-term planning supported by political commitment, funding, and cohesive action by State and local Government.

Public transport and infill housing projects have been undertaken but planning and delivery has been less consistent or cohesive. Only four of 13 major long-term land use and transport objectives for Perth and Peel have been fully achieved. Planning for roads, public transport, land use and the environment has also not been fully integrated with planning for economic development. As a result, the locations of employment and housing and resulting commuting patterns are not always consistent with the objectives of planning and transport policy. Long-term, bi-partisan political commitment and cohesive planning for transport, land use and the economy is therefore necessary to deliver a public transport oriented future.



Since 1955, five land use strategies have been prepared for metropolitan Perth and Perth and Peel.

A number of long-term objectives, and targets for land use and transport in the region including targets for urban infill, reduced car dependence, and employment decentralisation have only been partially achieved.



## Major Finding 3:

### Inner destinations deliver 'the economic, density, liveability and accessibility package'.

The Perth CBD and central destinations are the heart of accessibility, economic activity and productivity. Evidence shows that the CBD and inner destinations are the preferred locations for professional and knowledge based employment; for higher-density living; and for public transport and active commuting. The CBD is also the only location in Perth and Peel where people can feasibly achieve a non-car dependent lifestyle.

Prioritising public transport investment along with higher-density employment and residential development in inner locations has the capacity to increase economic productivity, facilitate accessible, acceptable, affordable infill housing development, and deliver more consolidated patterns of urban development.

'Inward investment' also has the potential to improve access to the most jobs and shift the most commuters, because people who work in inner non-CBD locations have the highest capacity for mode shift.



"The Government seems to be working in opposing ways. Take a whole of Government approach"

Seventy per cent (70%) of *Get a Move On!* Commuter Survey respondents identify public transport investment in inner and middle locations as top priority for the region. Seventy per cent (70%) of commuters and a majority of businesses also support strategies to locate higher-density housing close to employment and public transport infrastructure. By contrast, 24% of commuters support prioritising public transport investment in heavy rail for the outer suburbs.



People who commute for 50 minutes or longer are 6.2 times more likely to drive than commuters who travel for less than 10 minutes.

Commuters who travel 30-40km to work are 4 times more likely to drive than people who live within 5km of work.

Cycle and walking commuters most often live and work in locations within 15km of the CBD.

### Major Finding 4:

#### White collar workers and students commuting to knowledge destinations have the highest capacity to be public transport users.

Commuters are diverse. Capacity for public transport and active commuting, and travel preferences, vary according to profession, income, personal and home circumstances.

The *Get a Move On!* Commuter Survey results and ABS statistics indicate that people in white collar professions such as managers, professionals, or clerical administration workers are more likely to be public transport commuters (13% used public transport to commute), compared with blue collar professions such as machinery operators and drivers, technicians and trades workers and labourers (9% used public transport to commute). This is partly because they are less likely to need their car at work and are more likely to work in the CBD or other accessible central destinations. Very low income commuters (i.e. students with an income of less than \$20,000 per annum) and young people (aged under 35 years) are also less likely to commute by car.

Some commuters also have a higher capacity for mode shift than others. Dissatisfaction with driving, most often due to traffic congestion or parking restrictions, combined with a stated preference for alternative modes has been identified as the primary motivator for mode shift. Approximately 25% of car commuters are dissatisfied with driving and prefer alternative modes. These commuters most often live in outer locations and work in outer CBD and inner destinations. Improving access to central, non-CBD destinations is therefore important to facilitate mode shift.

Young people (aged under 35) are more likely to travel by public transport, but this is most often due to affordability rather than choice.



This is reflected by the fact that people aged under 35 are more likely to identify car as their preferred mode in an ideal world than commuters aged over 35.

### Major Finding 5:

#### People who live in central locations are more likely to use public and active transport.

“There is no point driving and parking for such a short journey”



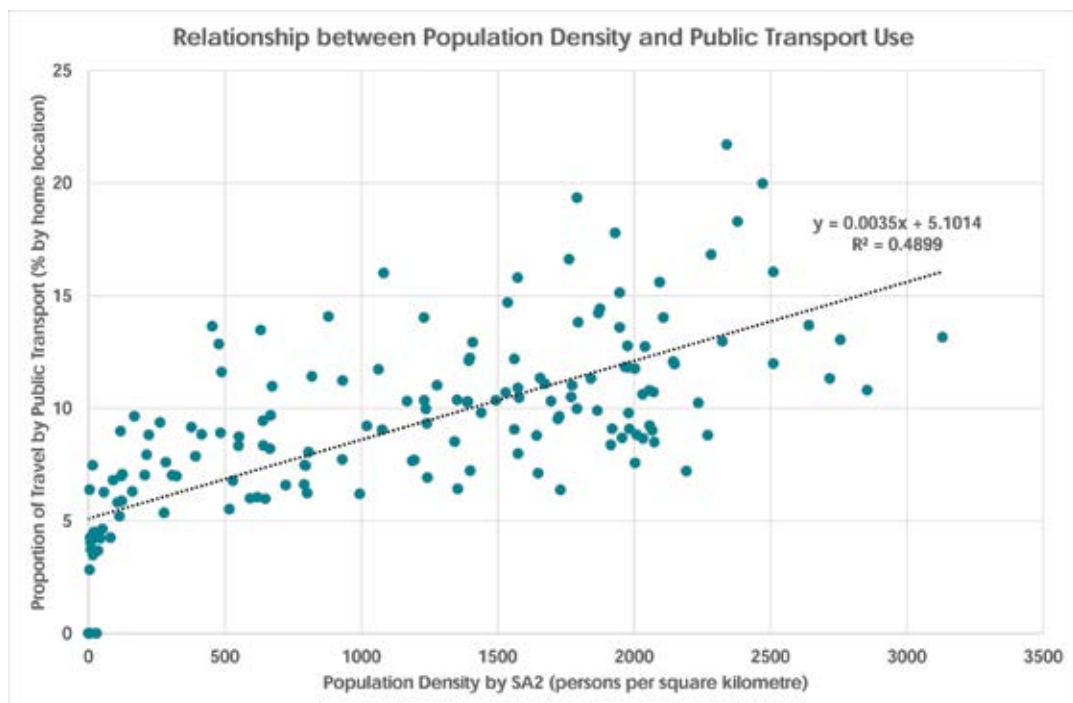
The *Get a Move On!* Commuter Survey, combined with published evidence indicates that inner suburban commuters commonly travel shorter distances to work, own fewer cars on average, and are more likely to choose bus or active modes than outer suburban commuters, particularly for journeys of 10km or less. Inner suburban commuters commonly choose bus because it picks them up close to home and drops them close to their destination. They also often perceive it to be more convenient, less stressful and cheaper and avoids ‘the hassle’ of driving through traffic and parking for a short journey. Maximising the number of commuters in inner locations therefore requires more high frequency public transport services within walking distance (approximately 1km) of homes.

## Major Finding 6: Targeted density increases public transport commuting.

There is a positive relationship between high-densities and public transport use in Perth and Peel.

Higher-density environments motivate and support public transport commuting by providing the critical mass needed to support high frequency services; enabling more people to live close to work; reducing the walking distance from homes to high frequency transit stops; and limiting land available for parking.

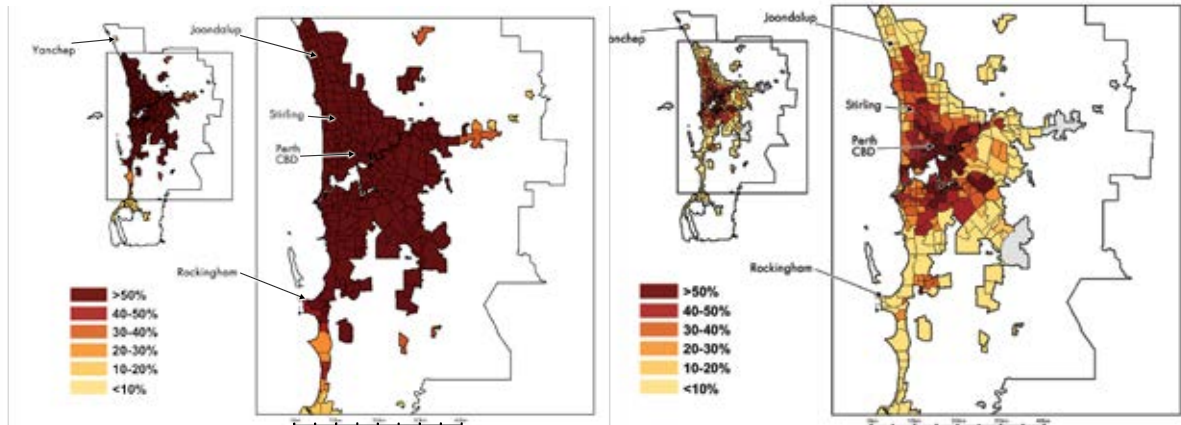
Density is therefore a motivator for sustainable commuting, particularly when focused in locations that are accessible to high frequency public transport or within walking or cycling distance of a major destination. In Perth and Peel, employment densities are highest in the CBD and central employment areas. Residential densities have increased in recent decades, yet areas with higher than average population densities have become more dispersed. Evidence indicates that there are benefits to be gained by focusing high residential and employment densities in areas that are highly accessible by public transport.



### Major Finding 7:

#### Outward growth reduces public transport resilience and accessibility.

Evidence shows that low-density growth is difficult and costly to service with public transport and that people living in fringe locations have the lowest capacity to access jobs within a 45 minute car or 60 minute public transport commute. Research also indicates that the linear growth pattern of Perth and Peel is reducing the resilience of existing infrastructure, particularly north-south routes.



Low-density growth patterns also generate pressure for infrastructure investment to be focused on extending the transport system outwards to service new fringe areas, rather than inward to deliver new infrastructure and services and improve capacity of the system in established areas that accommodate the majority of jobs and people and generate the bulk of public transport trips.

### Major Finding 8:

#### Access to high speed, high frequency public transport is important in outer locations.



*"My train journey is easy. I hate driving on the freeway at rush hour"*

Public transport commuters living in outer locations are most often train commuters. These commuters commonly identify speed and convenience as motivators for train use. Outer suburban rail commuters benefit from the speed of rail, particularly along the Mandurah and Butler lines, which are among the highest performing in Australia and are fast compared to driving on congested freeway routes. Stations on the Mandurah and Butler lines attract on average almost 4 times more boardings per day than the older, heritage lines. The speed and frequency of rail means that people are willing to travel an average of 4-5km to access a railway station. Maximising access to rail stations by bus and car is therefore of high importance in outer suburban origin locations. It is also critical to ensure that existing transport services in these locations have capacity to accommodate new users.

## Major Finding 9:

### Perth needs a small number of high-intensity employment hubs.

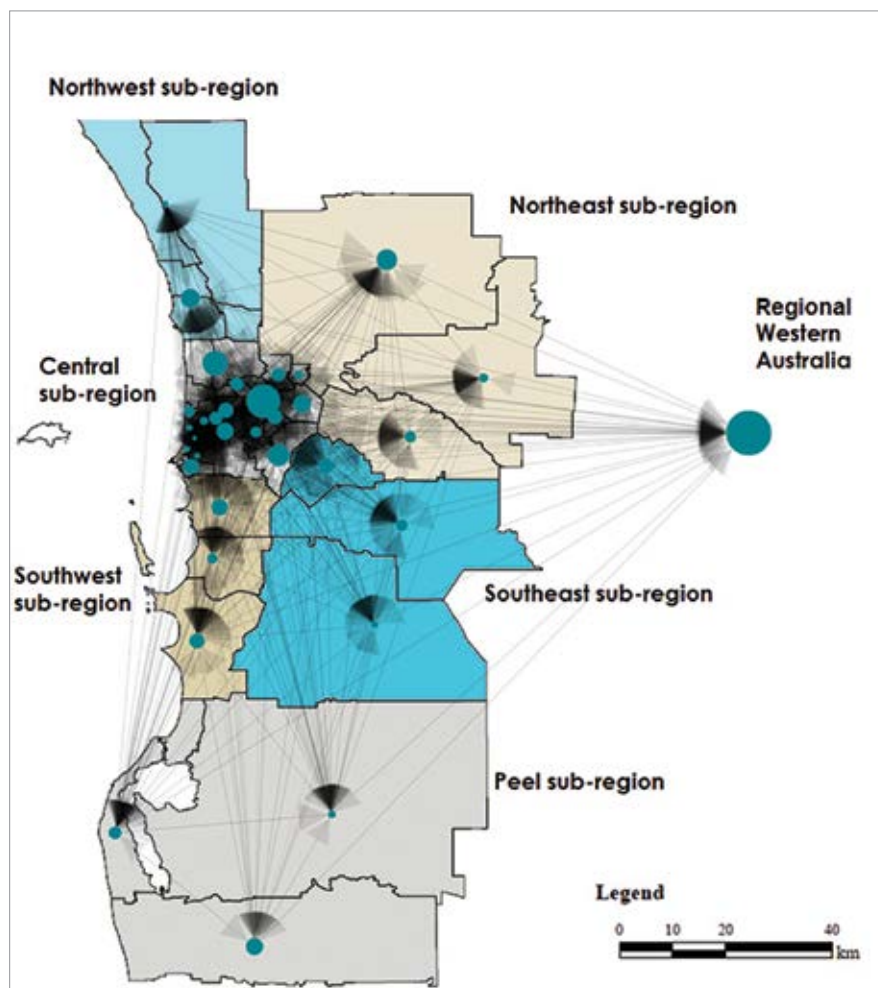
Reducing commute distances by enabling more people to live and work in the same sub-region has been a key strategy for Perth and Peel since 1970, but success in shifting employment to outer employment centres has been relatively limited. In practice, 64% of employment remains within approximately 15km of the CBD and most people travel to central locations for work. Commuter support for employment decentralisation is high, yet support among major CBD and central businesses is low. This is because businesses locate in the CBD and central areas for specific reasons including profile, amenity, access to skilled workers and proximity to peers, clients and customers. It is also because central locations are the most accessible locations by road and public transport. Agglomeration in central locations creates economies of scale and delivers business benefits.

Planning policy for metropolitan Perth currently recognises 200 activity centres in the region including 10 Strategic Metropolitan Centres as focal points for service sector employment and public transport investment. As a result, employment has become relatively dispersed and few employment hubs have adequate densities and employment types to support public transport use. Evidence also indicates that Perth is excessively reliant on the CBD as the core public transport node in the region.



*"There have been way too many hubs"*

Get a Move On! has found that there is the potential for transport efficiencies and productivity benefits by focusing knowledge and professional service sector employment into a smaller number of higher-density, high-amenity hubs supported by direct radial and orbital public transport connections. Knowledge hubs are most important from a public transport perspective, because while industrial and retail employment locations are of substantial significance from an employment, economic and productivity perspective, they are less successful as public transport hubs.



## Major Finding 10:

### Sub-regional centres provide employment opportunities in specific occupations.



“I work in sales and need my car for work”

While the success of strategies to decentralise employment has been limited, especially strategies to decentralise professional and knowledge based employment, some employment types suit non-central locations and are more likely to attract local workers. This includes sales, community and personal service industries and secondary industries such as manufacturing and construction. Industrial and retail hubs, which accommodate these types of employment are primarily situated in middle and outer locations and travel to them is primarily by road. 43% of respondents to the *Get a Move On!* Commuter Survey were committed drivers and these people are most likely to work in non-central industrial and retail locations. *Get a Move On!* therefore acknowledges the importance of these centres and the need for high-quality road connections supported by local active and public transport connections to allow local people to access employment and services within their own sub-region, however it establishes that these centres are less effective as anchors for high-frequency metropolitan public transport connections.

**Sub-Region Job Skills Mismatch, Occupations Minus Numbers of Working Residents in Those Occupations, Number of Workers, 2011**

Sub-region	Managers	Professionals	Technicians and trades workers	Community and personal service workers	Clerical and administrative workers	Sales workers	Machinery operators and drivers	Labourers
Northwest	-10,058	-16,276	-17,786	-6,741	-15,824	-5,627	-5,481	-6,474
Northeast	-2,571	-4,926	-5,330	-3,156	-6,484	-2,290	-2,343	-2,575
Southeast	-4,042	-5,962	-10,321	-3,646	-9,533	-3,682	-6,514	-5,490
Southwest	-2,371	-5,290	-6,381	-3,546	-6,129	-2,628	-3,013	-3,490
Peel	-1,040	-812	-3,073	-638	-1,104	-384	-1,853	-1,502
Central	11,299	16,363	7,913	7,257	29,258	7,815	3,826	1,575

## Major Finding 11:

### Industrial centres are critical to the State's economy and require high-quality road access.

Industrial centres generate significant economic activity, employ a large proportion of Perth's population and rely on high-quality road links. Businesses involved in industry, manufacturing, warehousing, freight and logistics typically locate in areas that are both accessible by road and accessible to major transport infrastructure nodes such as airports or ports. These locations are specific as they offer the ability to be positioned in dedicated industrial estates, provide the capacity for large premises, are more affordable, enable expansion, provide access to specific infrastructure, avoid inner-city congestion and provide on-site parking.



“Being a tradesman, I need to attend different places every day”

Typically, industrial locations have low capacity for public transport use because of their low-density nature due to the large space requirements of industry and industrial activities that generate non-pedestrian friendly environments.

The *Get a Move On!* Commuter Survey identified that shift workers and trades workers are more likely to travel to work by car as they travel outside of public transport service hours and/or need to transport goods, tools or materials to work.

## Major Finding 12:

### Investment is needed before penalties are applied.

There is a prevailing view among commuters and businesses that public transport in Perth and Peel is not yet sophisticated enough to substantially shift people to public transport through behaviour change.



“We need to invest in improving the existing system before we encourage more people to use it – because it can’t take more people at the moment”

Support for incentivising public transport use is very high, but investment in improving public transport and making it more competitive with the car for travel to major employment destinations is the number one priority in the short to medium-term future.

On average, a public transport trip to a major employment destination takes twice as long as driving and requires 3 transfers. Missing a connection adds an average of 32 minutes to the journey.

Overcrowding frustrates 65% of train users and 42% of bus commuters.

Daily cost of public transport is a de-motivator for mode shift for car commuters who have access to free parking at work.



## Major Finding 13:

### New mechanisms are needed to fund the future.



“We are going to need innovative thinking to get projects off the ground”

State Government revenue is unlikely to be adequate to fund new transport infrastructure projects in their entirety. More options are needed to ‘fund the future’ and this will require the identification of a long-term pipeline of quality infrastructure projects; rigorous project assessment; and a diverse pool of mechanisms that can be drawn on to fund projects on a case-by-case basis.





## Recommendations and Actions

These ten recommendations outline a number of transformational moves to guide investment for Perth's mobility future. The 33 actions provide an implementation pathway for the next 20 years to achieve an efficient, multi-modal, mobility network which includes high-quality interconnected public and active transport.

### Recommendation 1:

**Ensure a public and active transport future for Perth.**

- 1) In the lead up to the 2017 State election, all parties to commit to prioritisation of public and active transport investment to ensure long-term, bi-partisan commitment.
- 2) Future projects need to align with the recommendations and actions of *Get a Move On!*

### Recommendation 2:

**Perth is a mobile, liveable, vibrant and prosperous region for all.**

- 3) Prepare an evidence based, regional economic development strategy for the Perth and Peel region, in consultation with major stakeholders including local government, to inform the future.
- 4) Prepare an overarching, evidence based, integrated strategy to align regional land use, economic, environmental and transport objectives for Perth and Peel.
- 5) Take a whole of Government approach by requiring all strategic, spatial and statutory plans in Perth and Peel to be consistent with the overarching regional land use, economic, environmental and transport strategy.
- 6) To limit future sprawl, plan for Perth's growth to go no further than land that is currently designated as 'urban deferred' in the Metropolitan Region Scheme.
- 7) Recalibrate infill housing targets to increase population densities in locations identified in the recommendations of the *Get a Move On!* report and review infill targets in all other areas.

### Recommendation 3:

**Recognise the Capital City, Perth CBD, as the primary location for employment growth and high density residential development and plan for the proportion of people living and working in the CBD to increase to support productivity, vibrancy and public and active transport infrastructure.**

- 8) Amend all relevant planning policy for Perth and Peel to support growth in the proportion of employment and residential infill development within the Capital City.

### Recommendation 4:

**Designate six locations as Knowledge/Professional/Health Hubs. These hubs will act as major nodes in the public and active transport network and as focal points for diverse live, work and play opportunities.**

- 9) Amend all relevant planning policy for Perth and Peel to designate six Knowledge/Professional/Health Hubs - Subiaco, UWA/QEII, Curtin/Bentley Technology Park, Fremantle, Murdoch and Joondalup - as professional service, health, science and technology/knowledge sector destinations. These centres will be focal points for high-density knowledge/professional/health employment growth and medium and higher-density living opportunities.
- 10) Prioritise investment in public and active transport infrastructure to connect designated Knowledge/Professional/Health Hubs to the CBD and to each other, as well as facilitating rapid transit movement from major commuter origin locations (see section 4.11). This investment should aim to enhance the radial network and commence the development of an orbital system of movement through inner and middle locations.

#### **Recommendation 5:**

#### **Reconnect Perth's Urban Villages with active and public transport infrastructure.**

- 11) Prioritise public transport infrastructure investment and services to deliver a highly interconnected 'turn up and go' public transport system servicing Perth's Capital City and Urban Villages. These are inner destinations within five kilometres of the Capital City - West Perth, Northbridge, East Perth, Leederville, Mount Hawthorn, Mount Lawley, South Perth, Wembley, West Leederville, Subiaco, Burswood and Victoria Park.
- 12) Create an active transport network to support short trips in and between the Villages.
- 13) In conjunction with the delivery of new transport services, fill in the 'missing middle' between the CBD and Perth's Urban Villages by increasing the number of residents.

#### **Recommendation 6:**

#### **Generate public and active transport use by increasing population in appropriate locations.**

- 14) Increase population around major transport hubs to deliver sufficient patronage levels needed to support a 'turn up and go' multi-modal network.
- 15) Utilise the funds raised from the Metropolitan Region Improvement Tax to purchase land in fragmented ownership surrounding major transport hubs in order to facilitate appropriate renewal.

#### **Recommendation 7:**

#### **Plan for Sub-regional Service Centres to meet the lifestyle, employment and service requirements of their local populations.**

- 16) Amend all relevant planning policy in Perth and Peel to recognise the role of Sub-regional Service Centres as important retail and service sector employment hubs for the local and sub-regional community. These include Rockingham, Midland, Cannington, Mandurah, Morley, Melville, Stirling, Booragoon, Belmont, Claremont, Dianella, Armadale, Karrinyup, Hillarys, East Victoria Park, Wanneroo and Willetton. Focus on improving connectivity to these destinations.

#### **Recommendation 8:**

#### **Industrial Centres require high-quality road access to ensure the efficient movement of workers and freight.**

- 17) Develop a road network plan aligned with the proposed overarching regional land use, economic, environmental and transport strategy to guide investment for car and freight access to industrial centres including Osborne Park, Welshpool, Malaga, Canning Vale, Wangara, Belmont, Balcatta – Hamersley, Perth Airport, Maddington, Kewdale Commercial, Tonkin Park, Bibra Industrial, Kwinana Industrial, Forrestfield – Wattle Grove, Hazelmere – South Guildford, Henderson and O'Connor.



**Recommendation 9:**  
**Optimise Perth's transport system.**

- 18) Publish, fund and implement the Public Transport Authority's Route Utilisation Strategy with priority given to those routes currently operating at or close to capacity.
- 19) Prepare and implement a road optimisation strategy that ensures the existing road network operates at greatest efficiency.
- 20) Provide real-time travel information at all high-frequency bus stops.
- 21) Facilitate on-demand transport to help connect commuters to the public transport network.
- 22) Prepare an integrated plan for Intelligent Transport Systems for road, public and active transport in Perth and Peel.
- 23) Implement the State's Open Data Policy to deliver broad public access to road and public transport network and movement data and use big data analytics to improve the system.
- 24) Develop a single smart phone travel application that provides real-time information to commuters on all journey options, times and costs including options for public and active transport, driving and on-demand transport. The app should also enable people to provide feedback on their journey.
- 25) Provide additional opportunities for contactless payment to access public transport services (i.e. payWave).
- 26) Prepare and fund the implementation of local, station specific transport, access and amenity plans in consultation with Local Government Authorities and communities to increase access and use of existing and future train stations and key bus interchanges.

**Recommendation 10:**  
**Commit to the best use of existing and alternate funding mechanisms to deliver transport and infrastructure projects.**

- 27) Review the transport budget including currently hypothecated funds and reallocate as necessary to deliver on the commitment to a public transport future.
- 28) Reassess non-contracted major road and rail projects in the pipeline to ensure they will achieve the best outcome for Perth and Peel.
- 29) Expand business case criteria for road, public and active transport infrastructure projects to quantify the potential economic, social, health, land use, transport and environmental benefits to improve project selection, assist in the development of a pipeline of quality projects and identify appropriate funding mechanisms.
- 30) Make public the assessment of each business case to provide greater transparency in the decision making process.
- 31) Undertake a detailed investigation of all alternative funding mechanisms to identify a diverse pool of funding options for the region and make this publicly accessible.
- 32) Review and amend SPP3.6 to provide a certain and consistent process through which Local Government Authorities access developer contributions to undertake improvements to infrastructure and local amenity to support incremental infill and greenfield development. This should be applied throughout Perth and Peel.
- 33) Solicit innovative, non-government funding solutions for the delivery of transport projects.

Appendix 1 is an assessment of activity centres and underpins the recommendations.



## Section 1: Introduction



*Get a Move On!* is an innovative research project undertaken by the Committee for Perth with Core Funder RAC and major funders AECOM, ANZ, City of Subiaco and supporting funders Finbar, HASSELL, Ipsos, UWA and the entire Committee for Perth membership. This report is the result of 12 months of research undertaken as part of the project.

*Get a Move On!* takes a people based approach to examine commuting in Perth and Peel with the aim of identifying new strategies to 'get the region moving' towards an efficient, multi-modal, twenty-first century transport system.

The key aim of *Get a Move On!* was to address the mobility challenges facing Perth, culminating in a report that:

- Outlines community and business preferences and choices for Perth's future mobility;
- Identifies preferred solutions for the Perth region;
- Benchmarks key solutions against current international best practice; and
- Articulates a collaborative action plan and pathways for Government, private and non-Government organisations to deliver solutions that achieve a mobile future for the region.

The report makes ten recommendations with 33 actions for the State Government to deliver over the next 20 years. The recommendations focus on delivering a public transport oriented future, consistent with the stated preferences of people and businesses.

### 1.1 Methodology – Putting People First

*Get a Move On!* is an evidence based project 'by Perth for Perth'.

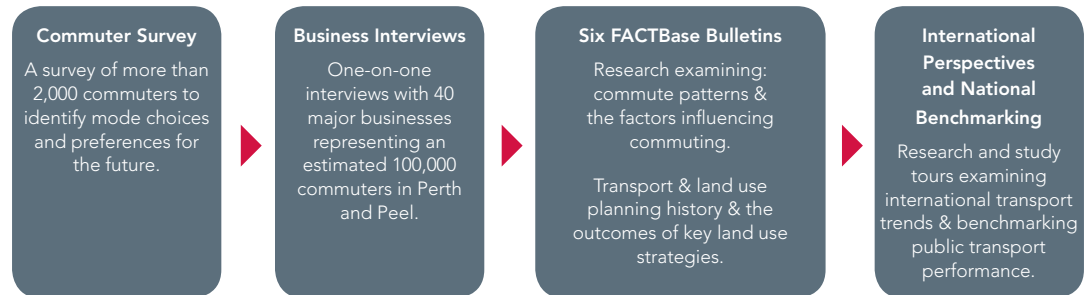


# Get

# a Move

# On!

The key steps taken to deliver a 'people first' approach are outlined below:



1. **Commuter Survey:** In October 2015, a survey of more than 2,000 Perth and Peel commuters was conducted by Ipsos on behalf of Get a Move On!, the survey provided a detailed understanding of the commuting habits and preferences of Perth and Peel residents.
2. **Business Interviews:** A series of one-on-one interviews with 40 businesses, representing an estimated 100,000 commuters in Perth and Peel from various industry sectors including banking, construction and development, design, education, local and State Government, health, industry, insurance, leasing agents, media, not-for-profit, professional services, real estate, resources and transport.
3. **FACTBase Research:** The release of six papers prepared under the long-term strategic joint venture research agreement with The University of Western Australia - FACTBase. These Bulletins examined the impacts of the region's land use and employment structure on commuting. They are:
  - [FACTBase Bulletin 46](#) - Commuting Across Perth and Peel: Unpacking Patterns Measures and Policy Implications.
  - [FACTBase Bulletin 47](#) - The Attraction of Perth and Peel Centres for Global Firms and Local Commuters.
  - [FACTBase Bulletin 48](#) - The Impacts of Employment Decentralisation on Commuting in the Perth and Peel Regions.
  - [FACTBase Bulletin 49](#) - The Dilemma in Sub-Regional Commuting: Matching Resident Jobs Skills to Workplace Location.
  - [FACTBase Bulletin 50](#) - Examining 60 Years of Strategic Planning in Metropolitan Perth and Peel.
  - [FACTBase Bulletin 51](#) - The Relationship between Transport, Spatial Form and Economic Growth. A Comparison and Analysis of Sydney Melbourne and Perth.

These Bulletins provide detailed evidence to support many of the findings presented in this report and can be found on the Committee for Perth website at: <https://www.committeeforperth.com.au/research/factbase-research/factbase-bulletins>.

4. **External Research:** The University of Plymouth, UK through Associate Prof. Jon Shaw, has contributed a review of international transport trends, while Prof. Carey Curtis, Dr Jan Scheurer and Mr Sam McLeod from Curtin University, WA, prepared a paper benchmarking the performance of the regional public transport system with systems in other Australasian regions.

## 1.2 Project Background

*Get a Move On!* was initiated in direct response to Committee for Perth and external research, which identified increasing community concerns and frustration regarding commuting across Perth and Peel.

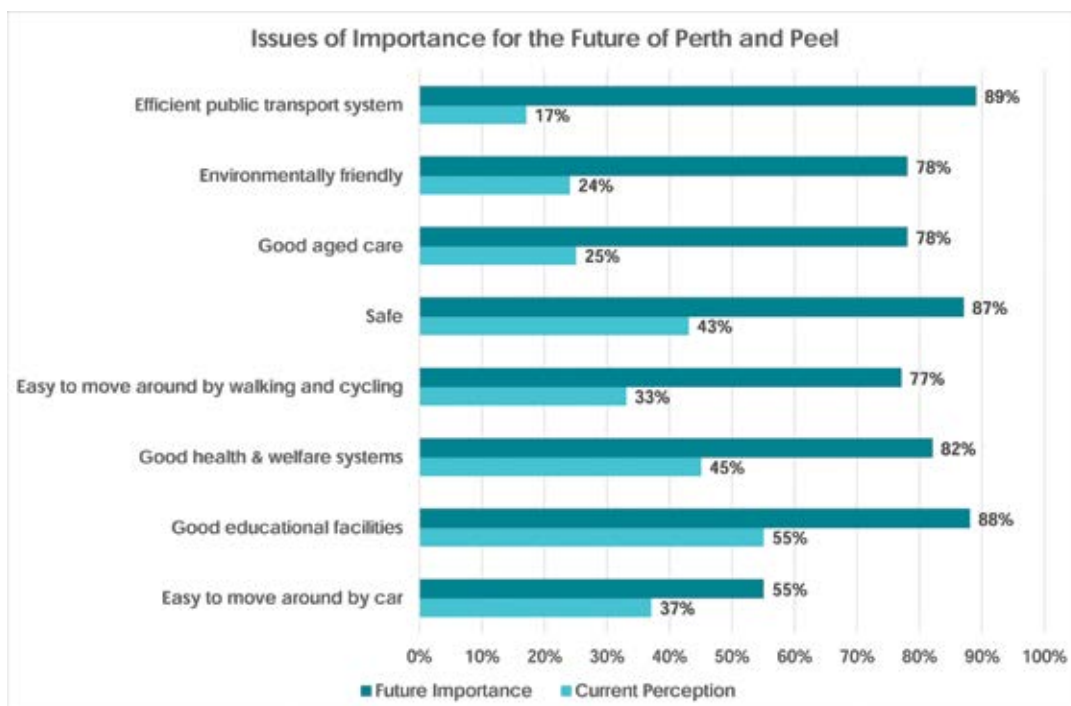
In 2012, the Committee for Perth released its landmark report - *Towards a Bright Future, a vision for Perth as a region of 3.5 million people*. The research report outlined two scenarios for the Perth and Peel regions – ‘Bright Future’ and ‘Business as Usual’ and made 20 recommendations for action by Government. One of these recommendations was for Government to ‘*Develop a long-term integrated public transport network that includes all modes of transport to ensure efficient movement throughout the region as well as to facilitate transit-oriented development*’. At the commencement of the *Get a Move On!* project, the region was still waiting for a transport plan for Perth’s future.

‘*Towards a Bright Future*’ was informed by the inaugural Perth Perceptions Survey, undertaken in 2012 (1:5 = Committee members and 4:5 = general public), through which the Committee took the pulse of more than 500 community members to identify the priorities of Perth and Peel residents for the future. The quality of public transport in Perth and Peel was identified as a key weakness and improving public transport was identified as the number one priority for the future of the region.

In 2015, the Committee for Perth commissioned Ipsos to undertake the second Perth Perceptions Survey and the results showed that the proportion of respondents who perceived the region’s public transport system to be efficient had decreased from 25% to 17%. Additionally, support for public transport investment in Perth and Peel had increased, with 89% of respondents identifying an efficient public transport system as important for the region’s future.

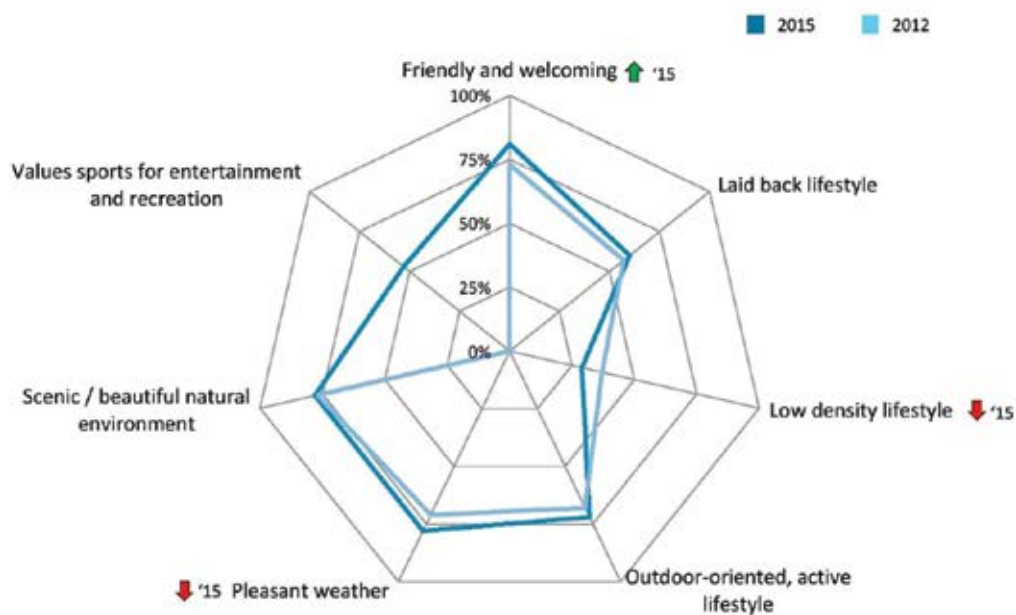
Furthermore, when asked which issue they would prioritise if given the opportunity to be Premier for the day, nearly half of all residents surveyed said that they would get on with the delivery of public and active transport infrastructure.

Figure 1b: 2015 Perth Perceptions Survey – Issues of Importance for the Future of Perth and Peel (Source: Ipsos, 2015a).



The 2015 Perth Perceptions Survey also identified a perception that Perth and Peel is transforming from a 'traditional and old fashioned' metropolis into a more modern and contemporary city suited to young people. This transformation is widely perceived to be positive and is associated with declining importance being placed on characteristics such as low-density living and car dependent lifestyles.

Figure 1c: Perth Perceptions Survey – Future Lifestyle Expectations in Perth (Source: Ipsos, 2015a).





This almost unanimous perception that Perth needs an improved public transport system is supported by evidence that has identified the region is underperforming in some areas and that, without action, the economic, social and environmental costs of our heavy reliance on cars for travel will substantially increase. There is therefore a need to get the region moving towards a more efficient public and active transport system.





# Autonomous vehicles are an exciting prospect but are not a magic bullet

- Professor Jon Shaw,  
Plymouth University



## Section 2: International Commuting Trends and Policy Implications

Professor Jon Shaw  
Plymouth University, United Kingdom

### 2.1 Introduction

As in Perth over recent decades, commuting trends in cities and countries internationally have changed so that increasing numbers of people make their journeys over longer distances.

This Section examines international commuting trends at a national and city level, focusing particularly on the culturally familiar examples of the United States and the United Kingdom. It then moves on to identify some key issues that will need to be taken into account by policy makers as they grapple with future commuting needs and behaviour. The extent to which these issues will influence any given travel-to-work area will depend upon the specific mix of local circumstances, but at a general level, and especially in the context of significant projected population growth, they are as relevant to Perth and Peel as they are to Boulder and Birmingham, Seattle and Southampton.

### 2.2 Commuting and Car Dominance

The commute – a term initially adopted because of the ‘commuted’ fares regular travellers would receive when travelling to work by train – still results in busy trains and buses, but is perhaps best characterised by traffic congestion and pollution, caused by people driving alone between their homes and places of work.

The overwhelming dominance of the private car in commuting both at a city and national scale has come about because of a mixture of factors. Some are technological, in that they enable ‘anytime, anywhere’ travel between locations. The allure of such flexibility and convenience is extremely powerful, even if it is somewhat illusory. There’s not a great deal of flexibility sitting in a traffic jam, and people without access to a car can find it difficult to access jobs and services, especially in areas of low-density development. Other factors are economic – it is often perceived that the car is cheaper than alternative modes; social – people like their own space and comfort; and political – the ‘freedom’ provided by the car is often seen as a metaphor for wider ideals (Lucas et al., 2011).

## 2.3 Commuting Trends in the United States and United Kingdom

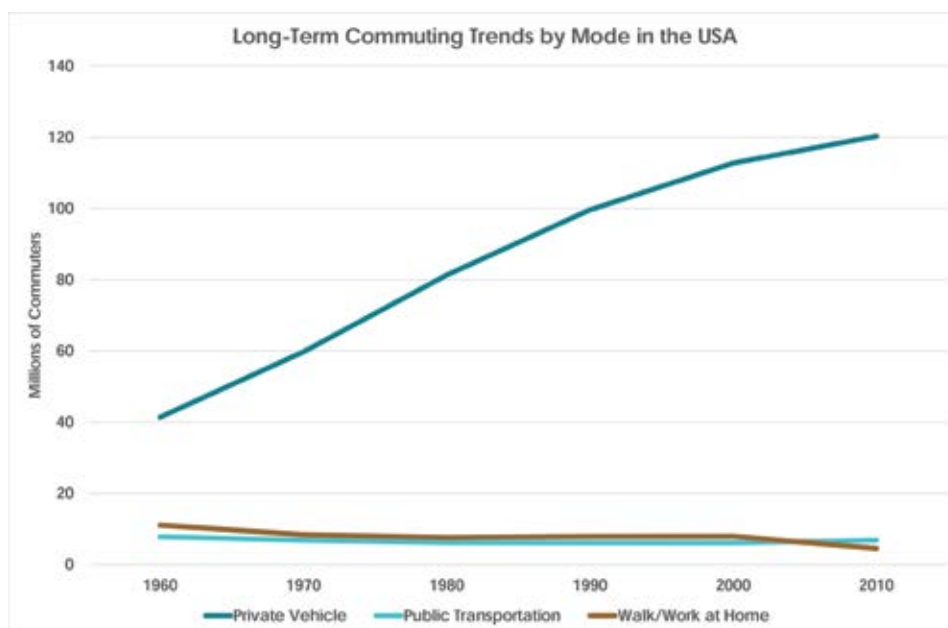
In the United States of America (USA) and the United Kingdom (UK), the commute, at one point relatively simple to describe, has become more complex over time. Not only have geographic origins and destinations dispersed, but the timing of journeys has become more variable to reflect flexible and part-time working conditions in local labour markets. The number of people working at home for at least some of the time has increased (Lyons, 2015), and the rise in two (and more) profession households has also impacted upon journey patterns and timings (Suprenant-Legault et al., 2013). The tendency to 'trip chain' – combining the journey to work with the school run or a shopping trip, for example – has also become more pronounced. Indeed, and perhaps surprisingly, the majority of trips made during the rush hours are for purposes other than commuting (see Currie & Delbosc, 2011; Department for Transport, 2015).

Historic underinvestment in public transport systems compared with, say, much of continental Western Europe, has further encouraged people to rely on their car as the primary mode of their commute. One study (Commission for Integrated Transport, 2001) found that Britain has the most congested roads in Europe, for example, with around 15% of the country's trunk routes subject to traffic delays for more than an hour a day and 7% for more than three hours.

### 2.3.1 Commuting in the USA

Around 16% of all trips in the USA are commuting trips. Average commuting trip lengths now stand at around 20 kilometres, as opposed to an average of 16 kilometres for other trips, and have been increasing (American Association of State Highway and Transportation Officials (AASHTO), 2015a; Kneebone & Holmes, 2015). Figure 2a shows the long-term commuter mode trend in the country at the aggregate level. As population rose, so the number of commuters increased and most of these took to using the private car. Despite the presence of High Occupancy Vehicle lanes on urban freeways in many cities, the proportion of commuters carpooling has more than halved since 1980. Public transport's modal share has also declined since 1980 (MacKenzie, 2015), although there was some growth in the last decade, especially in major cities such as New York, Los Angeles and Washington, DC (AASHTO, 2015b). A similar proportion of people now work at home as take public transport to their place of work, although this doesn't mean that they don't make other journeys at various points during the work day, including in rush hours (Mokhtarian & Tal, 2013).

**Figure 2a: Long-term Commuting Trends by Mode in the USA**  
(Source: US Census Bureau, 2010, cited in AASHTO, 2015a).



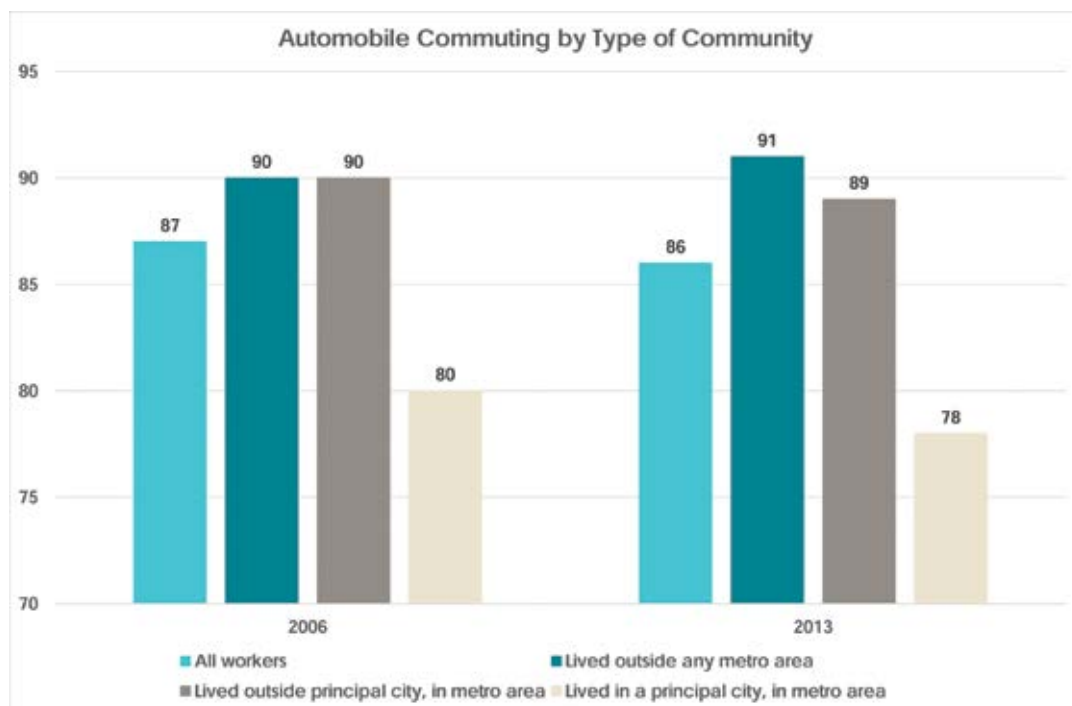
In the United States, more-or-less the same proportion of men and women commute by private car (86.07% and 86.47% respectively), carpool (9.88% and 9.47%) and public transport (4.63% versus 5.29%), although given that public transport commuting is not popular among very high wage earners in the Northeast of the country, it is reasonable to assume that women are more likely to use public transport when commuting to lower-paid work. It is also interesting to note marked variations between other groups.

Table 2a breaks down commuting mode share by ethnicity, and a clear disparity can be seen between white and non-white commuters. Figure 2b shows that those living outside of the principal city in a metro area (i.e. suburban local authority areas rather than within the city limits of New York, Denver, Seattle, etc.) have higher rates of car commuting compared with those who live within the principal city. What is very clear in the American context is that by far the greatest number of people live in suburban or non-metro areas – 75% or roughly 250 million people – reflecting the strong cultural preference for the ‘single family home’. This is of course replicated in Perth, with the overwhelmingly dominant aspiration, of nearly four out of every five residents, being for a separate dwelling (see Maginn, 2016).

**Table 2a: Commute Mode Share by Race and Ethnicity in the USA in 2010**  
(Source: US Census Bureau (2010), cited in AASHTO, 2015a).

	White (Non- Hispanic)	Hispanic	Asian (Non- Hispanic)	Black (Non- Hispanic)	American Indian (Non- Hispanic)	All
Drive Alone	80.1%	67.8%	67.2%	72.5%	75.0%	76.7%
Carpool	8.0%	15.8%	13.1%	9.7%	12.6%	9.7%
Public Transportation	2.9%	7.8%	10.4%	10.9%	3.0%	4.9%
Bicycle	0.5%	0.7%	0.5%	0.2%	0.3%	0.5%
Walk	2.6%	3.2%	4.0%	2.6%	3.7%	2.8%
Work at Home	4.9%	2.8%	3.8%	2.6%	3.8%	4.3%
Other	1.0%	1.8%	1.0%	1.4%	1.5%	1.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total Workers	92,300,585	20,377,332	6,923,815	14,351,838	594,584	137,026,072

Figure 2b: Automobile Commuting by Type of Community (Source: US Census Bureau (2013), cited in MacKenzie, 2015).



### 2.3.2 Commuting in the UK

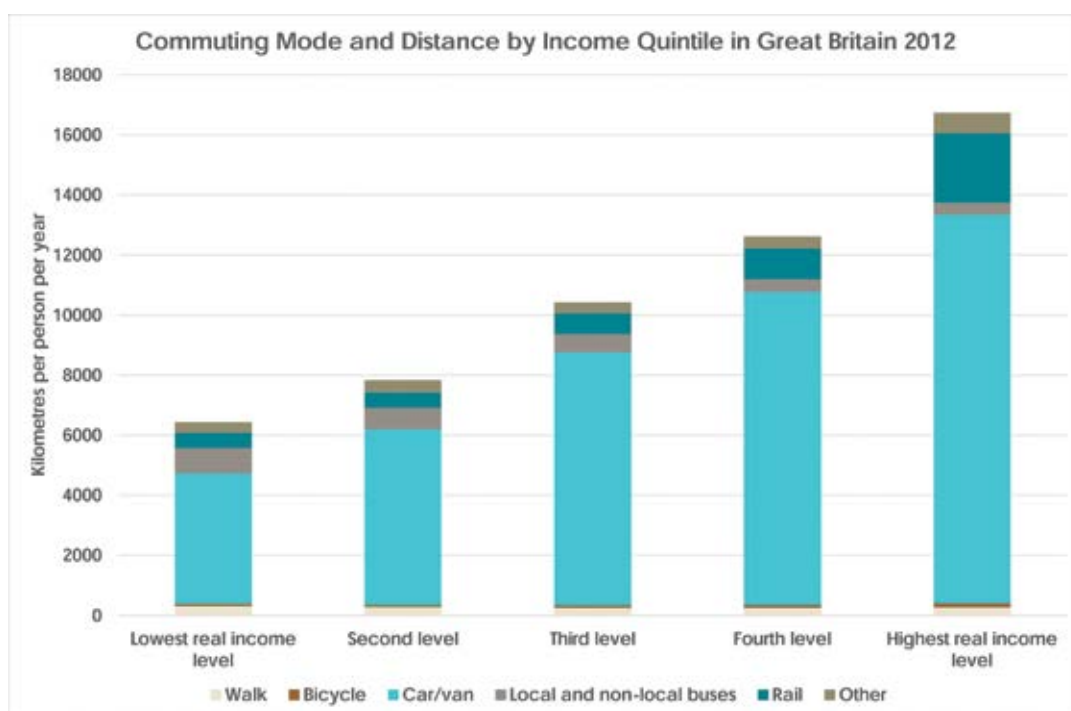
As in the USA, commuting accounts for 16% of all trips made in the United Kingdom and, again, because they tend to be longer than the average, at around 13.5 kilometres, they account for 20% of distance travelled (Department for Transport, 2015). Commutes in the UK have also been increasing in length over time. Although the proportion of commuting trips has dropped across the population as a whole since 1995, the UK has its highest ever levels of employment, which is in part a reflection of an ageing society. The extent to which working from home is responsible for the declining proportion of commuting journeys is unclear (Department for Transport, 2015).

Similar to the United States, the predominant mode of commuting in the UK is the private car, although it 'only' accounts for 65% of trips and 75% of distance travelled. Again though, car occupancy rates are extremely low: 85% of journeys are made by the driver only, and the average occupancy rate is 1.2. High Occupancy Vehicle lanes are much less popular in the UK than in the USA, although incentives are sometimes available for car-sharing (Ison & Mulley, 2014). The car is dominant for all commuting trip lengths over three kilometres, around 45% of short trips are walked, but public transport use is significantly higher than in the USA, at around 18% of trips made. As trip lengths increase, so the modal share of rail goes up, to a peak of around 30% for journeys of more than 80 kilometres. Indeed, 57% of all trips by rail are for commuting and business purposes (Department for Transport, 2016).

Men make about 30% more commuting trips than women across all age groups, but travel almost twice as far. Figure 2c shows commuting mode and distance by income quintile in real kilometres. It is striking how much further those in the higher income quintiles travel than those with lower incomes, and also the greater distance travelled by rail by the better-off. Much of this is explained by the importance of rail commuting in the south east of England, the grey 'other' category includes the Tube in London, and rail has been increasing its modal share in this area, including over longer distances (Figure 2d) (Murphy et al., 2013).

Although the proportion of commuting journeys made by public transport tends to be higher in urban areas, London is in a league of its own, with mode shares not uncommon in major cities on the European mainland. Only 37% of Londoners travel to work by car, with 48% by public transport, 10% by foot and cycling at double the national average of 4% (Department for Transport, 2015). Transport for London has in recent years embarked upon the biggest sustained investment in rail, underground and bus services in generations, and is spending almost £1bn (AUD 1.75bn) on new cycling infrastructure. By way of comparison, Transport for London has invested £16bn in the Crossrail project (a new heavy rail line through central London) and £6bn in Thameslink (a major capacity upgrade on the north-south heavy rail link).

**Figure 2c: Commuting Mode and Distance by Income Quintile in Great Britain 2012 (Source: Department for Transport, 2013).**

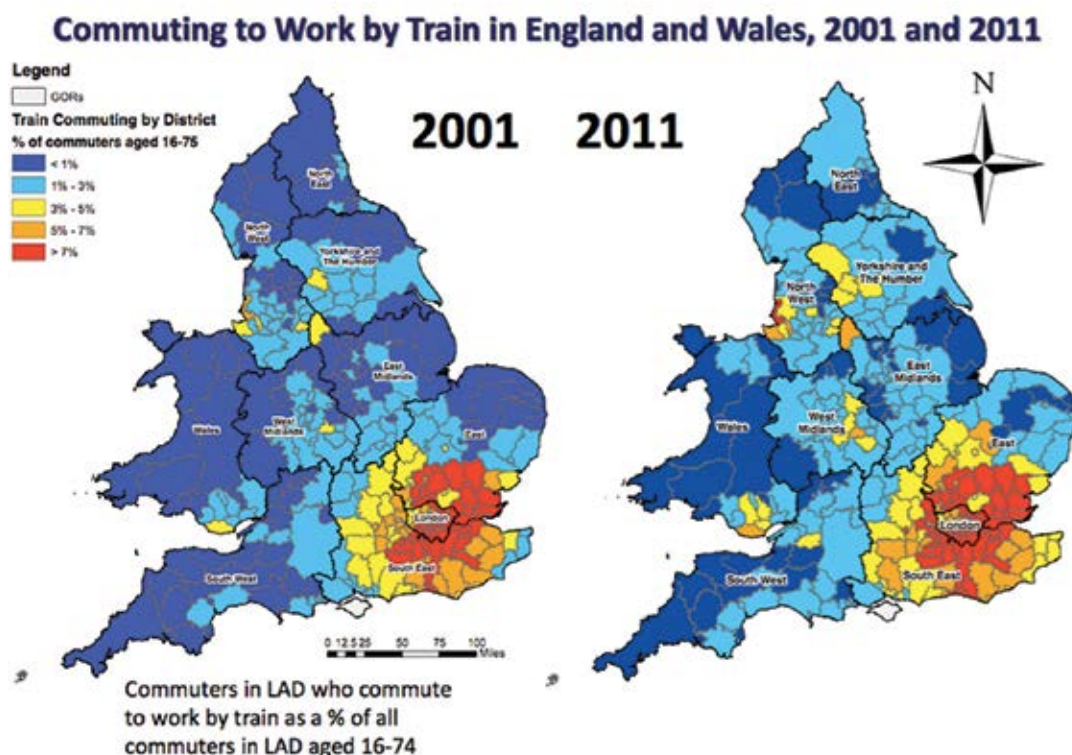


## 2.4 Policy Questions for the Future

As noted above, but also in previous Committee for Perth and The University of Western Australia FACTBase publications, commuting trends and behaviour are strongly related to a range of factors – economic policy, the changing nature of the labour market, planning decisions, demographic change, social preferences and so on – that are often beyond the immediate day-to-day concerns of many transport professionals. Clearly though, it is important that policies designed to address the negative impacts of a commuting culture focused on the private car are not developed in a silo. Transport planners have to be in close contact with their colleagues in a range of different organisations and government departments; this issue will be explored further later. At the same time, some notable developments within the transport sector itself are significant in relation to potential future commuting trends.



Figure 2d: Commuters in Local Authority Districts Who Commute by Train as a Percentage of all Commuters Aged 16-74  
(Source: Murphy et al., 2013).



One such change is that in developed countries, vehicle kilometres per person might have reached a plateau, or could even be declining. So-called 'peak car' has been linked to numerous factors beyond the GFC including a rise in the cost of motoring, changing domestic arrangements, increasing environmental consciousness and a decline in the cultural attraction of cars (Goodwin & Van Dender, 2013). It is important not to get carried away with the potential for peak car to offer a panacea to rush hour congestion, not least because it refers to vehicle kilometres per person rather than vehicle kilometres overall. Population growth, such as that predicted in Perth, may well offset reductions in personal kilometres travelled such that an increase in vehicle use continues to be observed. Moreover, peak car in this context implies the need for significant investment in public transport, if people choose trains and buses as alternatives to some of their existing vehicle kilometres.

Another reason that some people will use their cars less to commute is the rise of working from home. Although some degree of telecommuting has always been possible in certain professions, the rise of the digital age has made teleworking a more realistic proposition for a far larger number of people (Lyons, 2015). At the same time, research seems to show that hopes of a 'digital age transition' resulting in lower transport demand are optimistic (Mokhtarian & Tal, 2013). In as much as using Information and Communication Technologies (ICTs) can be a substitute for certain journeys (working from home, online banking, etc.), they can also stimulate them (they're easier to book, for a start) or at least redistribute them (a commuting journey is replaced by a mid-morning trip to a local coffee shop).



That said, evidence indicates that a large proportion of drivers are amenable to leaving their cars at home, but are often unaware that reasonable alternatives exist (Anable, 2005). Building on the success of Personalised Travel Planning (Sloman et al., 2010), smart phone applications ('apps') capable of showing multi-modal journey options could become important tools in shaping travel behaviour, especially if they can incentivise non-car travel through 'rewards' for subscribers, perhaps in the form of discounts at local businesses.

Those who do shift modes will find that, at least for the moment, another major benefit of digital age technology is that travel time on public transport can be used much more productively than it can when driving a car (Lyons & Urry, 2005). Productivity in this sense is not limited to traditional notions of being able to do more work. Indeed, it is starting to emerge that nearly half of teenagers and young adults in the USA would rather lose access to their own vehicle than to the internet (Read, 2012); after all, Facebook can be updated when riding on the train.

It has long been known that ICTs can make transport systems run more efficiently, and perhaps the biggest anticipated development in this regard is the autonomous vehicle. A realistic proposition within the next 10 years (Local Transport Today, 2016), the fully autonomous vehicle is sometimes regarded as a magic bullet because it promises huge capacity uplifts and large safety gains. If increasingly running on battery or hydrogen power it could go a long way to addressing pollution concerns at the same time. There are other benefits too: time that is currently spent driving the car could be devoted to other tasks, such as emailing (or updating Facebook); there would be no need to look for a parking space upon arrival at the destination because the car could do that automatically on the driver's behalf; and the car could be out earning revenue (a kind of driverless Uber) when not required by its owner.

Autonomous vehicles are certainly an exciting prospect, but they are almost certainly not a magic bullet. Much depends upon how people choose to use them (Metz, 2016). Assuming that for commuting journeys car occupancy remains low, they will remain a fundamentally inefficient means of moving large numbers of people along busy corridors. 'Concertina' congestion may well be relieved but the design capacity of key junctions and urban arterials will still be overwhelmed. Driverless cars may result in far larger numbers of journeys being made in off-peak periods if owners look to press them into service as 'automated Ubers'. Insurance questions also arise, whose fault is an accident if no-one is driving? And in any event, the full range of capacity and safety gains can only be obtained if all cars are running automatically at all times, or at least during all busy periods, and while this may not present much of a technical problem, it has to be remembered that driving fulfils an important social function and attempts to ban it would likely run into stiff opposition.

But none of these issues – and there will be more – suggest that appropriate transport policy measures will not be capable of managing the commute of the future any more or less than they are now (see also Docherty et al., 2016). There should still remain a strong role for public policy in determining how the transport system in any given jurisdiction will look and how it will function. There is no escaping that in large urban areas, strategic investment in non-car modes and the promotion of alternatives to the car will be as necessary in 2050 as it is today. It may be necessary to introduce some kind of road user charging scheme, both to tackle congestion and to replace fuel duty revenues as the number of electric and hydrogen-powered vehicles increases. Different transport modes have different benefits and drawbacks, and the best kind of transport policy will let each mode play so far as is possible to its strengths.

More broadly, the need to pursue complementary transport, land-use, health, economic development and social policies will not go away. This presents a difficult but not insurmountable test for public policy. Research shows that the chances of success are improved if:

- Cities have the right institutional arrangements, in that key policy areas such as transport, planning, economic development and the like are under the control of one body;
- The necessary finances are available to support strategic transport investment; this can be in the form of government grants but other mechanisms such as hypothecated sales taxes, payroll levies, road charging schemes and land value capture are used successfully in different countries;
- Transport is of sufficient importance in the local area that it has political champions willing to stake, at least some of their reputation, on delivering improvements; and
- A competent technocracy is in place to oversee the implementation of schemes. In London, for example, it was necessary to recruit from all over the world to assemble a team capable of delivering the investment plans put in place as a result of the above conditions being met.

These things in combination result in sufficient 'strategic capacity' to deliver successful transport strategies that are consistent with other key policy objectives (MacKinnon et al., 2008).

## 2.5 Conclusion

Commuting across the developed, and especially the English-speaking, world has become more car-dominated in recent decades. While the car has many advantages, an over-reliance on these advantages has led to, among other things, significant problems of pollution and congestion, especially during peak hours. Looking beneath aggregated patterns reveals disparities between the commuting habits of different social groups, and these already present significant challenges for policymakers seeking to maximise people's access to labour markets within the confines of existing financial resources and, perhaps, institutional arrangements. Looking towards the future, so-called 'peak car' and technological developments will present new policy challenges, although it is difficult to avoid the conclusion that sustained investment in non-car modes will still be required if the transport systems of major cities are to serve and indeed help shape their cities as efficiently as possible. What kind of place do we want our city to be? Increasingly car-dominated? More inclusive and efficient? More pleasant and pedestrian-friendly? The answer to such questions will go a long way to determining what the transport system looks like by 2050.

## 2.6 Summary of Key Findings

### Travel Distance, Mode Choice and Employment Locations

The distances people commute between home and work have increased.

The popularity of private car for travel is evident around the world, including in the United Kingdom and the United States.

Cars are convenient and flexible and the freedom they provide strongly appeals to people.

The dispersal of employment into low-density areas means that a lot of people have no viable transport alternative.

Commuting has become more complex. Origins and locations have become more dispersed, working hours and conditions have become increasingly variable, the number of workers per household has grown and trips are multi-purpose.

Historic underinvestment in public transport systems has increased the appeal of car today.

### Commuting in the USA

Increases in commuting in the USA are linked to population growth and despite initiatives to increase vehicle occupancy, car-pooling has declined.

Working from home has increased and similar proportions of people in the United States work from home as use public transport to travel to work.

Public transport is more popular among lower income earners.

People who live in suburban locations have higher rates of car commuting compared to people living within the principal cities.

Ethnicity has a significant impact on commuting choice in the United States with white Americans significantly more likely to drive.

### Commuting in the UK

The ageing of the population has reduced the proportion of commuting trips in the UK.

Rail is popular for journeys over longer distances (accounts for 30% of journeys of 80km or more) in the UK.

People travel further to access higher paying jobs.

In the UK, London is in a league of its own in terms of public transport mode share and this has been reinforced through sustained investment in public transport.

### Trends Influencing Transport

Transport decisions and planning need to reflect economic, demographic, land use and social trends and therefore cannot be developed in a silo.

### Peak Car

Do not get carried away with 'peak car' as a congestion solution because even if vehicle kms travelled per person decrease, population growth will still result in more cars on the road.

If trends such as 'peak car' are observed in Perth it will lead to an increased need for public transport investment.

### Working from Home

Working from home has the potential to reduce commute trips – although these people often make other trips on the road network at all times during the day.

### Technology

Drivers are often unaware of the alternative mode choices available to them.

Smart phone apps are emerging as important tools to shape travel patterns and influence mode choice by providing information and incentives for non-car travel.

Technology has enabled public transport travel time to become productive time.

Technology has the capacity to make transport systems run more efficiently.

There are many complexities associated with the use of driverless cars and we should not expect them to be a 'magic bullet' in regards to transport efficiency.

Strategic investment in non-car modes and the promotion of alternative modes will continue to be necessary as regions grow.

### Institutional and Policy Considerations

Cities need appropriate institutional arrangements in that key areas such as transport, land use planning, economic development and the like are under the control of one body.

Cities need funding mechanisms to support strategic investment.

A competent technocracy must be in place to oversee the implementation of schemes and projects.



## Policies promoting infill and employment decentralisation have had limited success



### Section 3: Strategic Land Use Planning in Perth and Peel

Ms Gemma Davis and Ms Georgia Harford-Mills  
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Since 1955, land use and transport planners have aimed to guide and influence the direction of growth in Perth and Peel through strategic planning. This Section provides an overview of major land use and transport plans and strategies prepared for Perth and Peel over this 60 year period, and outlines their strategic objectives and outcomes. It has been prepared with reference to FACTBase research undertaken as part of the *Get a Move On!* project.

#### 3.1 History of Strategic Land Use Plans for Perth and Peel

Early in the twentieth century, residential development in Perth and Peel was primarily focused around the historic central tram network, heavy rail system and the Swan River, with narrow fingers of growth evident along passenger rail routes to Armadale and Midland (see Figures 3a and 3b). Residents relied on the region's tram and rail system and on walking and cycling to travel through the region, and private motor vehicle ownership remained in the domain of a privileged few.



Figure 3a: Historical Tram Network in Perth and Peel  
(Source: Transit Maps, 2012).

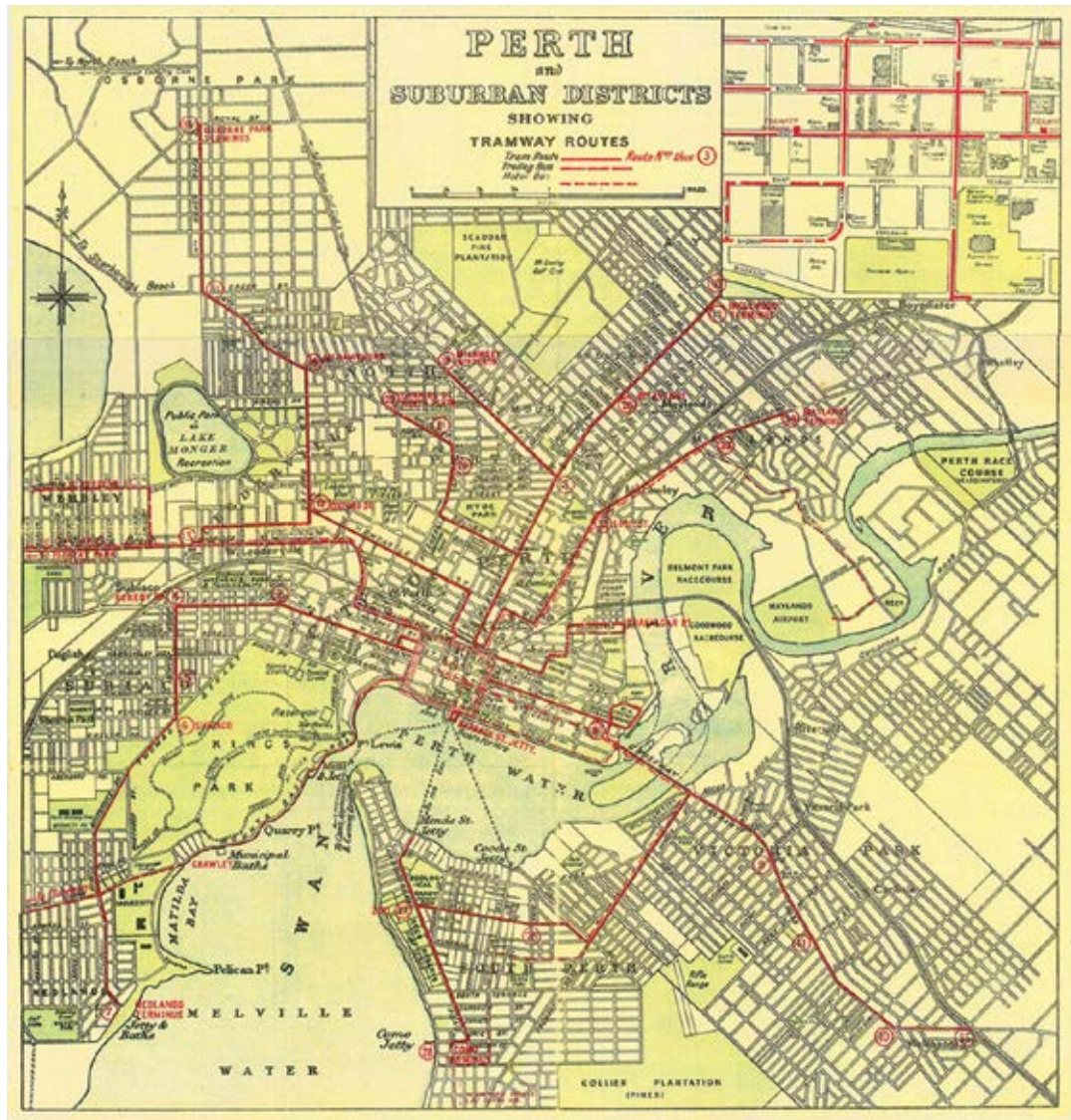
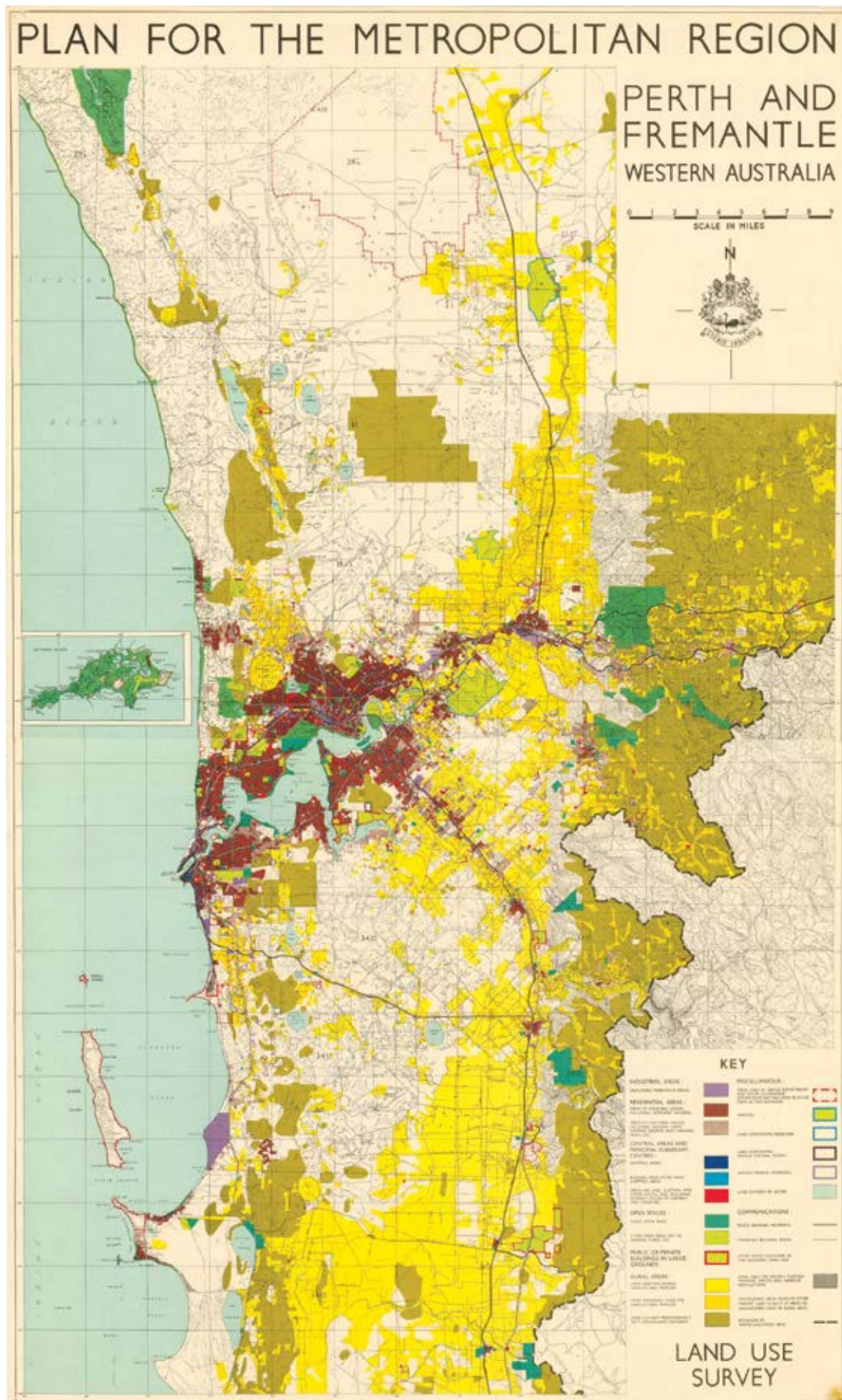




Figure 3b: Growth Pattern of Perth and Peel Prior to 1955  
(Source: Department of Planning, 2011).



However, following World War II, the affordability of cars substantially increased, opening the door to a new era of land use and transport planning that focused on delivering low-density, suburban lifestyles and transport by private car.

In Perth, this era witnessed the development of the first land use and transport strategy for Perth, the Stephenson Hepburn Plan (1955), which proposed a relatively even and contained pattern of growth for Perth as a region of one million people, with employment to be located in the Perth and Fremantle Central Business Districts (CBDs) and transport to be provided by through a 'superior' road system and extensions to the heavy rail network.

However in Perth and Peel, the arrival of affordable car ownership coincided with a period of rapid economic development and population growth. Residents purchased vehicles at far greater rates than had been predicted and demand for new low-density development outpaced supply.

This precipitated a shift in land use and transport policy towards corridor planning. The Corridor Plan for Perth (1970) proposed to focus low-density urban growth into five corridors radiating out from the Perth CBD.

The Corridor Plan promoted low-density growth, supported by decentralising a large proportion of employment and services into major suburban sub-regional centres within each corridor. Each sub-regional centre was to be accessible by car and linked to the Perth CBD by a radial road and public transport spine. The model envisaged that the primary role of public transport would be to provide access to the Perth CBD and major sub-regional centres for people without a motor vehicle.

Theoretically, the Corridor Plan was to create self-sustaining, distinctive residential corridors, delivering the low-density lifestyles people desired and reducing the need for residents to travel from suburban residential areas into the Perth CBD for work.

Yet implementation of the Corridor Plan faced obstacles before it had begun. Prior to the adoption of the Plan, retail centres began to emerge that were not within designated sub-regional centres but in dispersed, car dependent suburban locations. Employment also became more diffused with a substantial proportion of employers shifting out of the Perth CBD but remaining in inner locations rather than in designated metropolitan centres.

This, combined with substantial improvements in the quality of the road network and a sustained period of under-investment in the public transport system, meant that people in Perth and Peel increasingly relied on cars for all types of travel and public transport use declined.

In 1979, the controversial closure of the Fremantle to Perth rail line provided the catalyst for a shift in public policy towards investment in public transport provision. Community backlash against the rail closure thrust public transport into the political spotlight and transport became the focus of the 1983 State Election. The incumbent Government was defeated and the newly elected Government re-opened the Fremantle to Perth railway and initiated a review of the Corridor Plan.

The Corridor Plan Review (1985) identified concerns regarding the implementation of the Corridor Plan, which included a failure to develop the designated sub-regional centres; the continued concentration of tertiary employment within central Perth (the CBD and inner to middle suburbs); the ongoing low-density expansion of urban corridors; and the high cost of servicing residential development in fringe locations.

The Review recommended a change in focus towards urban consolidation and containment in Perth, rather than uncontained outward expansion. It also identified a need for the development of employment in middle and outer locations; for road development to support new employment areas; and the electrification, upgrade and extension of the metropolitan rail system (Stokes and Hill, 1992).



While the community strongly supported proposals for the electrification and extension of the passenger rail system to Joondalup and Currambine, proposals to increase urban consolidation and containment were less enthusiastically received.

The result was a new land use strategy for the region, Metroplan (1990) which proposed to continue to enable outward residential growth in corridor form, but also to consolidate urban form by 'filling in' areas between urban corridors and by directing 20% of growth into infill locations (i.e. existing urban areas).

Metroplan continued to promote the decentralisation of tertiary employment to increase employment self-sufficiency in outer locations and set a target for 80% of jobs to be outside the CBD. The strategy also aimed to support alternative modes of travel by developing land surrounding new and existing train station precincts and activity centres for high-density housing.

The transport goals within Metroplan were supported by the Perth Metropolitan Transport Strategy (1995), which proposed a 'balanced' transport system and focused on demand management to reduce car dependence in the Perth region – with goals to reduce travel by car to 46% of journeys.

By the turn of the century, public transport use was increasing and landmark redevelopment projects were underway, yet urban growth continued to extend the region's footprint outwards and employment remained focused in inner and middle locations outside designated metropolitan centres. There was growing impetus within State Government for a more sustainable urban and transport future for the Perth region.

The outcome was the development of a new land use and transport strategy for Perth and Peel – Network City (2004). This strategy proposed the integration of transport and land use by developing a network of places (activity centres) connected by corridors (activity corridors). It adopted an urban consolidation agenda, proposing that 60% of urban growth would be accommodated within the existing urban area.

Network City was highly aspirational and relied heavily upon substantial investment in public transport, employment decentralisation and support for high-density urban development. However it failed to gain broad community or bipartisan political support and was never formally adopted by the Western Australian Government.

This led to the development of the current land use strategy for Perth and Peel, Directions 2031 (2010) and the more recent strategic implementation framework, draft Perth and Peel@3.5million (2015).

Directions 2031 remains the current adopted strategy for Perth and Peel and aims to reduce the consumption of residential zoned land in Perth and Peel by applying a target for 47% of new urban development to be urban infill with 60% of infill to be in non-central sub-regions; implementing targets of 15 dwellings per gross urban zoned hectare; and establishing minimum residential densities in new development areas. It also continues to promote the decentralisation of employment into activity centres in order to increase employment self-sufficiency (or self-containment) in outer suburban sub-regions but also gives renewed recognition to the role of the Perth CBD as the primary employment centre.

Released two years after the opening of the Perth to Mandurah Rail line, Directions 2031 also proposed the preparation of a Public Transport Plan for Perth and Peel to provide a long-term strategy for public transport development.

A draft Public Transport Plan was released for public comment in 2011. Key aspects of the draft Plan included increasing the capacity of current public transport services and the development of new transformational projects including a rail link to Perth Airport and Forrestfield; and a new rapid light rail transit system through the areas of Alexander Drive, through North Perth, extending to Curtin, The University of Western Australia (UWA) and the QEII Medical Centre.

However the Public Transport Plan remained in draft form and, despite an announcement of the MAX light rail project to connect the CBD with Mirrabooka, the proposed investment in light rail did not proceed. Currently, the proposed heavy rail link to Forrestfield and the Perth Airport is the only committed major public transport project for Perth and Peel arising from the draft Plan.

On 29 July 2016, the State Government released Transport @ 3.5 Million, a draft transport plan for Perth and Peel as a region of 3.5 million people and beyond, for public comment. This is the first integrated road, public and active transport plan for Perth and Peel and is closely linked to the suite of Perth @ 3.5 Million planning documents which provide the strategic context for the delivery of Directions 2031 in Perth and Peel.

### 3.2 Summary of Strategic Objectives and Outcomes

Prior to Transport @ 3.5 Million, the Perth Metropolitan Transport Strategy (1995) was the only dedicated transport strategy (identifying objectives for road, active and public transport) that has been adopted for the region. The strategy incorporated objectives to reduce car dependence in Perth and Peel. Investment in major transport infrastructure has resulted in an increase in public transport journey to work mode share since the mid-1990s, partially achieving this objective.

FACTBase Bulletin 50, prepared as part of *Get a Move On!*, provided a detailed summary and assessment of land use and transport strategies for Perth and Peel from 1955 to 2016. It identified five major long-term land use strategic plans that have been prepared for Perth and Peel over a 60 year period. Despite this, the core strategic objectives and residential development outcomes outlined within major land use plans were found to have remained relatively consistent. For example:

- All adopted strategies for Perth and Peel have promoted low-density greenfield expansion as the dominant form of urban growth;
- The decentralisation of tertiary employment has also been a key strategy since 1970; and
- Strategies promoting market intervention to achieve urban consolidation and infill development have been consistently applied since the 1980s and 1990s.

The outcome of these strategies has been mixed. Low-density growth has remained dominant in Perth and Peel for the duration of the region's strategic planning history and the planning system has successfully facilitated orderly growth and co-ordinated infrastructure provision to support this growth. This has been achieved through long-term planning of growth areas and cohesive state and local authority planning and action.

In the case of employment decentralisation, while the original objective of the Corridor Plan was to establish five sub-regional employment centres to act as employment hubs within suburban corridors (Fremantle, Midland, Armadale, Joondalup and Rockingham), today planning policy promotes employment decentralisation vis-à-vis a hierarchy of more than 200 activity centres including 10 Strategic Metropolitan Centres and 19 Secondary Centres.

Evidence shows that, while the proportion of employment in the Perth CBD has reduced over time, employment has not substantially shifted to the identified 'Strategic Metropolitan Centres' but has become dispersed through locations within approximately 15km of the Perth CBD (see Section 4). This has arguably reduced the potential to achieve the transport efficiencies or 'self-sufficient' corridors originally envisaged in the 1970 plan.

Policies promoting infill development and employment decentralisation have also had limited and varying success. This includes policies promoting infill development adjacent to railway stations. Some of the reasons identified for this include inherent conflicts between core strategic objectives (i.e. objectives for a dominance of low-density development and objectives for infill development); community opposition; an increasingly fragmented governance framework at state and local level; and conflict between strategic planning objectives and market preferences.

For example, while infill housing targets have been relatively evenly applied across the region, the ongoing supply of greenfield land to accommodate existing growth patterns combined with a reliance on disparate local authorities to deliver targets and community opposition have resulted in wide variations in levels of achievement.

Uncertainty associated with implementing infill and employment targets has the potential to reduce the effectiveness of long-term planning for transport infrastructure (which relies upon a detailed understanding of future residential density and employment patterns). Table 3a below summarises key strategies contained within each plan.

**Table 3a: Summary of Key Strategies/Strategic Objectives and Outcomes**  
for Perth and Peel 1955-Present (Source: Davis and Harford-Mills, 2016).

Key Strategies/ Objectives	Stephenson Hepburn Plan (1955)	Corridor Plan (1970)	Metroplan (1990)	Draft Network City (2004)	Directions 2031 (2010)	Outcomes
1 Low-density greenfield expansion (as dominant)	x	x	x		x	Achieved
2 Decentralise employment	x	x	x	x	x	Employment has decentralised out of the CBD but is primarily dispersed through inner-middle locations
3 Focus employment into small number of strategic metropolitan centres	x	x	x			Not achieved
4 Employment into a hierarchical structure of activity centres				x	x	Partially achieved although patterns of decentralisation not consistent with activity centre hierarchy
5 Increase self-sufficiency and self-containment (to decrease journey to work trip length)		x	x	x	x	Limited achievement
6 High-quality road network (to cater for a majority of trips by car/road)		x	x	x	x	Achieved
7 Radial public transport system		x	x	x*		Achieved
8 Invest in new public transport infrastructure		x	x	x	x	Achieved from approx. 1990 to 2009
9 Reduce car dependency			x	x	x	Moderate achievement
10 Connected network of activity centres				x	x	Not achieved
11 Urban consolidation			x	x	x	Moderate achievement
12 Increase proportion of urban infill (target)			x 20% infill	x 60% infill	x 47% infill	Metroplan target achieved, D2031 target not yet achieved
13 Improve amenity Perth City centre			x	x	x	Achieved

\*Metroplan also identified/acknowledged the need for orbital routes.

The delivery of strategic objectives for land use and transport in Perth and Peel has also been hindered by inadequate integration between these two separate, yet closely related, disciplines. The Stephenson Hepburn Plan (1955) is the only fully integrated land use and transport plan ever prepared for Perth (i.e. incorporated planning for land use, roads and public transport within a single document).

Post the Stephenson Hepburn Plan, strategies and plans for road, public transport and land use were prepared separately, risking conflict between strategic goals and objectives. In addition, while strategic planning for land use and transport has become more integrated recent decades, there is still no single over-riding strategy defining principal, shared land use and transport goals and objectives for the region.

Furthermore, evidence presented in this report illustrates the symbiotic relationship between transport, land use and economic development and highlights the need for land use and transport planning to be paired with a broad economic strategy for the region.

The review of past strategies and plans undertaken as part of FACTBase 50 identified a number of public transport infrastructure initiatives for Perth and Peel (including proposals for rail, light rail, rapid bus and ferry) that have never been implemented. This may also reflect a long-term practice of incorporating proposals for public transport into regional strategic plans without rigorous assessment of potential costs and benefits and without plans in place for funding.

It also revealed that newly elected state governments are likely to initiate major reviews of the strategic planning framework and make changes to the strategic direction for land use and transport. This has affected the implementation period of some strategies and plans and influenced the capacity for the realisation of long-term strategic planning and transport goals.



### 3.3 Summary of Key Findings

#### Strategic Land Use and Transport Planning Framework

Five major land use strategies have been prepared for Perth and Peel over the past 60 years. Plans and strategies for road and public transport have primarily been prepared as separate documents.

The relationship between transport, land use and economic development is symbiotic and there is a need for land use and transport planning to be paired with a broad economic strategies for the region.

Of 13 major long-term land use and transport objectives for Perth and Peel, four have been fully achieved. Objectives most difficult to achieve are those which aim to intervene in the market to influence the location of housing or employment.

Impediments to achieving strategic objectives include conflicts between core strategic objectives; community opposition; an increasingly fragmented governance framework at state and local level; and conflict between strategic planning objectives and market preferences.

Major investments in public transport infrastructure from 1990 to 2009 successfully increased public transport use and decreased vehicle dependence, however growth in public transport mode share has recently subsided.

A number of infrastructure proposals (including proposals for new public transport) incorporated in regional strategic plans have not been implemented.

There are more than 200 activity centres in Perth and Peel including 10 Strategic Metropolitan and 19 Secondary Centres. The decentralisation of employment to a more dispersed pattern than was originally envisaged for the region is reducing the potential for transport efficiencies.

Uncertainty associated with implementing infill and employment targets could reduce the effectiveness of long-term planning for transport infrastructure, which relies upon a detailed understanding of future residential density and employment patterns.







## Section 4: Employment and Land Use Structure of Perth and Peel

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Commuting is the movement of people between their home and place of employment. Therefore, the land use and transport characteristics of metropolitan regions, that is where people live and where people work, are the primary influencers of commuting patterns, commute distances and the time people spend commuting.

This Section provides an overview of commuting time and distances in Perth and Peel; the spatial structure of employment and residential land uses in the region; the location of jobs by industry type; and key commuting outcomes. It has been prepared by the Committee for Perth with reference to FACTBase Bulletins prepared as part of the *Get a Move On!* project.

It finds that, in Perth and Peel, commuting is mainly associated with the movement of people from outer, low-density residential locations into centralised, yet relatively dispersed, employment destinations. People who live and work in central locations have the shortest commutes, and results of the *Get a Move On!* Commuter Survey suggest that average commute distances and times are increasing.

Most people in Perth and Peel drive to work, regardless of where they live or work, but commuters are more likely to choose car if they live and work in low-density areas. As in cities in the United States and United Kingdom, public transport transport use in Perth and Peel is highest among people living in the inner city and in inner suburbs and working in the CBD or centrally located higher density locations, particularly if these areas are home to tertiary, 'knowledge sector' employers.

In Perth and Peel, higher density employment locations are centralised. The Perth CBD and Subiaco-Shenton Park form the region's professional service sector and productivity heart. A strong diamond shaped corridor of economic activity and productivity is also evident between Fremantle, Osborne Park in the north, Perth airport in the east and Murdoch in the south, forming the region's 'global economic jewel'.



## 4.1 Commute Distance and Time in Perth and Peel

Evidence indicates that the distance travelled and the time people spend commuting to work in Perth and Peel has increased as the regional population has grown. Today people in Perth and Peel travel similar distances to work as commuters in other major Australian metropolitan regions including Sydney, Melbourne and Brisbane.

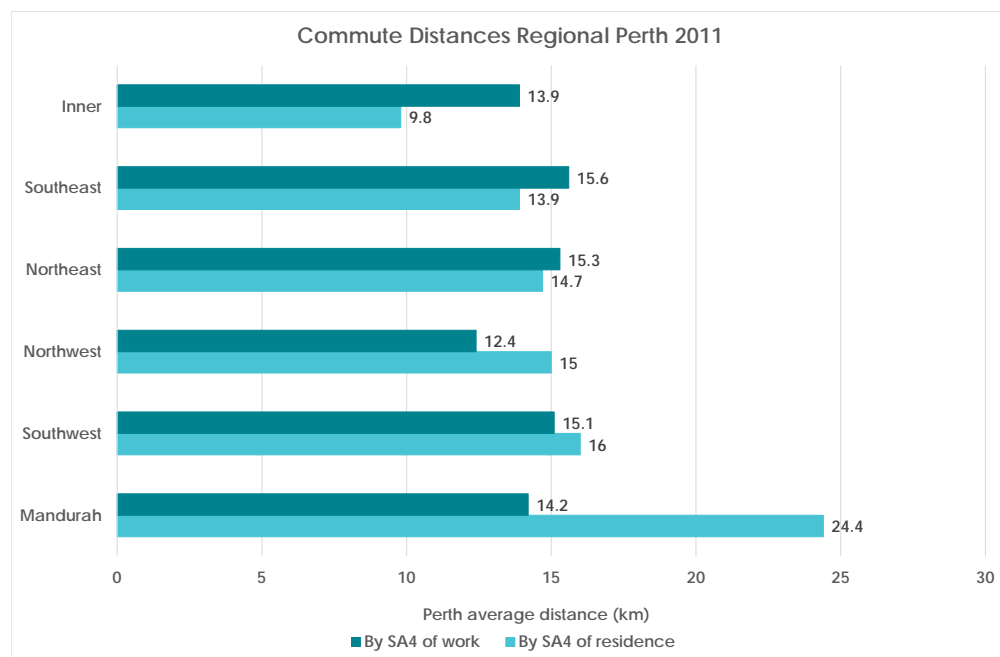
As outlined in Section 2, growth in commute distances is not unique to Perth. It is a trend common to cities in Australia, the United States and United Kingdom and is associated with the increased dispersal of geographic locations in cities and regions as they grow. Evidence shows that it is important for regions to counteract growth in commuting times and distances by ensuring the spatial structure of housing and employment evolves as the metropolis grows and that places are connected by high quality infrastructure.

### 4.1.1 Commute distance

In 2011, the average commuter in Perth and Peel travelled 14.9 kilometres from home to work (BITRE, 2013) and commute distances were longer for residents of outer locations than residents of inner urban locations. This pattern is common to all major Australian regions.

In Perth, Brisbane, Melbourne and Sydney, inner city residents have the shortest average commute distance (7–10 km), followed by the middle (10–15 km) and outer ring residents (greater than 15 km) (BITRE, 2015, p. 17). Cross-suburban commuting is a key feature of all regions including Perth and Peel (BITRE, 2013). In most capitals, journeys to work are longest for people travelling from outer locations into central locations. Yet in Perth and Peel the reverse pattern has been evident (BITRE, 2015). The average travel distance to workplaces within the Perth CBD is 13.9 kilometres compared to the overall average of 14.9 kilometres (BITRE, 2013). This is likely to be associated with the urban form of the Perth region, specifically its linear growth structure.

**Figure 4a: Commute Distances for Regional Perth 2011 (Source: BITRE, 2015).**



Commute distances in Australian metropolitan regions exhibit more variation on a per capita basis, with commute distances in Brisbane and Perth exceeding those in Sydney and Melbourne per head of population (BITRE, 2013). This implies that commute distances do increase with population growth, but not exponentially, and that commuting distances can also be influenced by other factors such as the structure of land use and the economy (such as density and dispersal) within individual regions. This process of adaptation is critical and requires forward planning.

### 4.1.2 Commute times

Average commute times in Australian metropolitan regions vary a little more than average commute distance. In 2006, average journey to work time for full-time employees in Australia's four largest cities ranged from 35 minutes in Sydney to 26 minutes in Perth (Davis, 2016).

This variation has been linked to multiple factors including population, urban footprint, infrastructure, congestion, topography and mode choice within individual regions (i.e. it takes longer to travel the same distance by public transport, walking and cycling than by car) (Kelly & Mares, 2013). The *Get a Move On! Commuter Survey* also shows that public transport commute times vary according to the accessibility of individual work destinations (see Section 8 of this report). This suggests that regional population growth, the location of housing and employment and the quality of infrastructure connecting them impact on the time that people spend travelling to work.

The *Get a Move On! Commuter Survey* also indicated that in 2015, the average commute distance for people travelling to work by car was 17.6 kilometres and the mean commute time was 27.4 minutes. Mean commute distance and times were longer among train commuters while bus journeys were shorter but also slower on a kilometre per hour basis. Table 4a below provides a summary of mean journey distance and time, and mode efficiency based on the outcomes of the *Get a Move On! Commuter Survey*.

**Table 4a: Mean Travel Distances and Time**

(Source: *Get a Move On! Commuter Survey, 2015*).

	Car	Train	Bus	Cycle	Walk
Mean Journey Distance	17.6km	26.1km	11.9 km	11.1 km	2.4 km
Mean Journey Time	27.4 min	47.5 min	40.8 min	29.7 min	24.4 min
Efficiency	38.4 km/hr	33 km/hr	17.4 km/hr	22.2 km/hr	5.9 km/hr

This suggests that over time, the average time spent commuting in Perth and Peel is increasing, consistent with commuting trends in the United Kingdom and United States.

## 4.2 Spatial Structure of Employment in Perth and Peel

Literature suggests that, theoretically, different residential and employment spatial structures deliver clear positive and negative outcomes. In particular, there is a body of work that argues that, theoretically, the decentralisation of employment offers a range of potential benefits, including increased proximity between the places people live and work, shorter commutes and reverse commuting (Burke, Dodson & Gleeson, 2010; Davis, 2016).

Yet there is also evidence that, in practice, decentralisation outcomes are less clear-cut. For example, metropolitan regions in the United States with large proportions of decentralised employment have been found to have longer average commutes distances than those in which employment is centralised (Kneebone and Holmes, 2015). This is thought to be because, as employment and housing disperses outwards, the total potential maximum commute distance between housing and employment locations increases (Davis, 2016).

Research and analysis undertaken as part of the *Get a Move On!* has established that the relationship between employment structure and commuting is complex and in Australian regions there is no clear evidence that decentralisation delivers commuting benefits (Davis, 2016).

In Perth and Peel, the spatial distribution of employment most resembles an 'inner and middle decentralised' structure. This means that a substantial proportion of employment has decentralised out of the central business district, but the CBD remains the primary employment centre with other major employment areas also focused in inner and middle locations (Davis, 2016). The result is that people mainly commute to central locations for work but that these locations are relatively dispersed.

The 'centralised' nature of this structure delivers the potential for transport efficiencies because transport infrastructure can be focused towards improving the accessibility of central locations. However, the dispersal of jobs means that employment densities are not always high enough to support public transport use and provision, and most centres, with the exception of the CBD itself, are heavily car dependent, placing considerable pressure on roads and parking.

**Table 4b: Overview of the Characteristics, Costs and Benefits of Employment Spatial Structures (Source: BITRE, 2015a; Burke, Dodson & Gleeson, 2010; Burke, Li & Dodson, 2011).**

Type of city structure	Spatial layout	Travel characteristics
Monocentric	A declining density gradient from the city centre outwards with centralised economic activity. Centralised jobs can result in agglomeration benefits, increased productivity and provide higher wages.	Strong radial movement that favours public transport provision with limited need for private cars.  Potential for long commutes in areas with dispersed urban form; increases pressure on radial infrastructure; and increased potential for congestion in inner areas.
Mono-Polycentric	CBD remains the main area of economic activity but increasing decentralisation of jobs has weakened the dominance of CBD.	Strong radial travel to CBD and high public transport use to central locations, but suburban travel/travel to outer employment locations remains mainly by private car.
Polycentric (urban village or activity centre based employment centres throughout the region)	Intra-urban patterns of clustering of population and economic activity consisting of independent multiple centres.	Potential for people to live near work and travel locally with a higher share of sustainable travel modes to outer and middle employment locations.  Potential to support agglomeration economies. Capacity to increase the share of reverse commuting. However, can increase commute distances, car use and reduce proximity to work, if levels of self-containment are low and public transport infrastructure is inadequate.
Dispersed Polycentric (sprawl)	Sub-centres present but no dominant centre with dispersed employment and services.	Each sub-centre generates trips from dispersed areas of the city creating relatively random patterns of movement. Car dominated and difficult to serve with public transport.
Decentralisation to inner and middle suburban sub-centres	CBD remains dominant area with employment and centres decentralised to sub-centres in inner and middle sub-regions.	Can increase capacity for public transport use (in comparison for dispersal of jobs in outer sub-regions) and increases accessibility for nearby workers. Limits capacity to reduce congestion on inner transport networks.
Connected Decentralised	CBD remains dominant area with employment centres decentralised to employment nodes, located along existing public transport routes.	Capacity to increase share of journeys by public transport and maximise use of the public transport network.

### 4.3 Employment Locations and Commuting Patterns

The spatial structure of employment influences the direction and distance of travel, as well as time spent travelling from home to work.

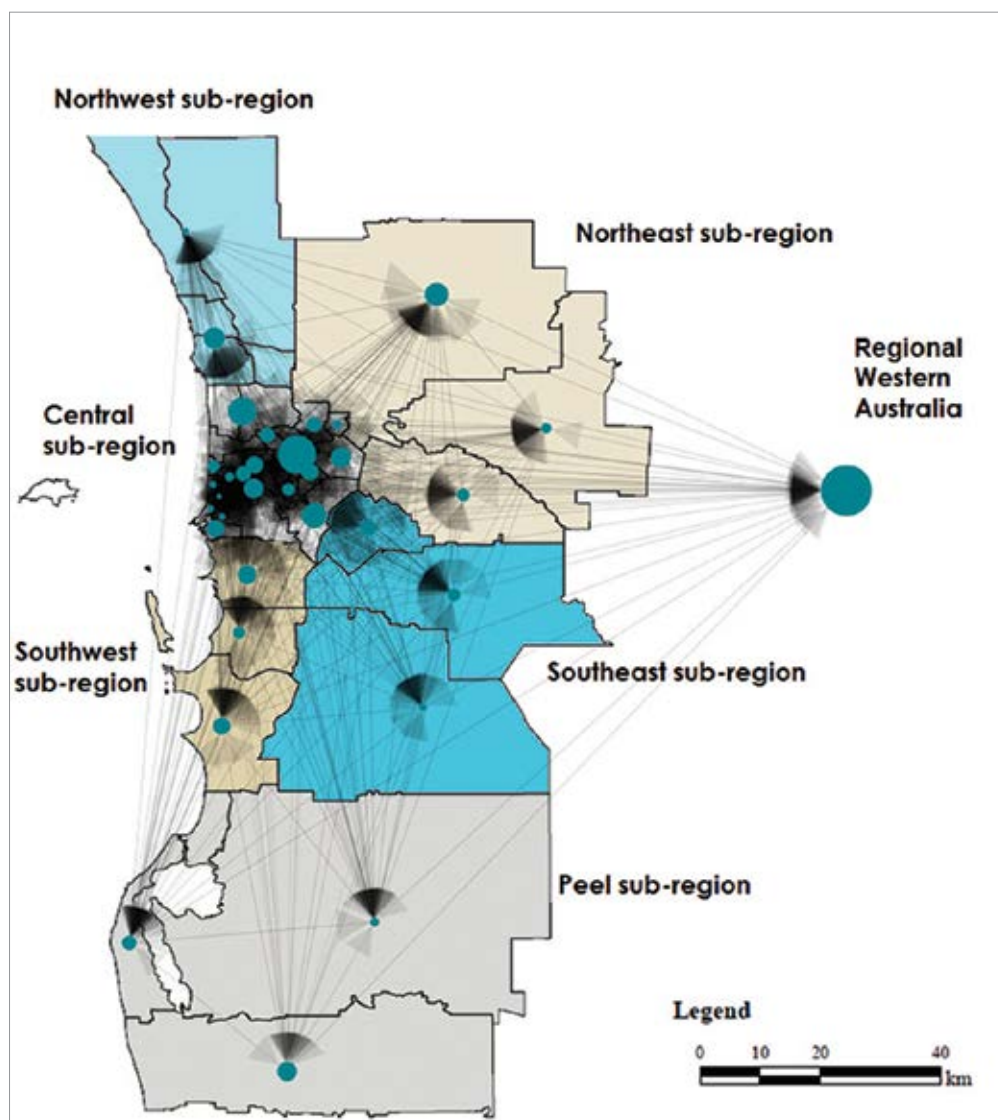
As outlined in Section 3, since 1970 a key land use and transport strategy for Perth and Peel has been the decentralisation of employment out of the CBD and central locations and into suburban activity centres. These strategies have aimed to increase the proportion of people who can live and work in the same sub-region, thereby theoretically reducing the need for suburban residents to travel long distances to work and easing traffic congestion.

However, research undertaken as part of the *Get a Move On!* project, has indicated that while the proportion of employment located in the Perth central business district has declined from approximately 60% in 1955 to 17% in 2011, 64% of total regional employment remains within the Central sub-region (Martinus & Biermann, 2016; Davis & Harford-Mills, 2016).

As a result, a majority of commuters continue to travel from outer sub-regions into the Perth CBD and locations within the Central sub-region and regional Western Australia, as shown in Figure 4b below. Infrastructure development has supported this pattern with a strong hub-and-spoke infrastructure development pattern around the Central sub-region despite decades of activity centre planning in outer sub-regions (Martinus & Biermann, 2016).

**Figure 4b: Commute Patterns in Perth and Peel**

(Source: Martinus & Biermann, 2016).

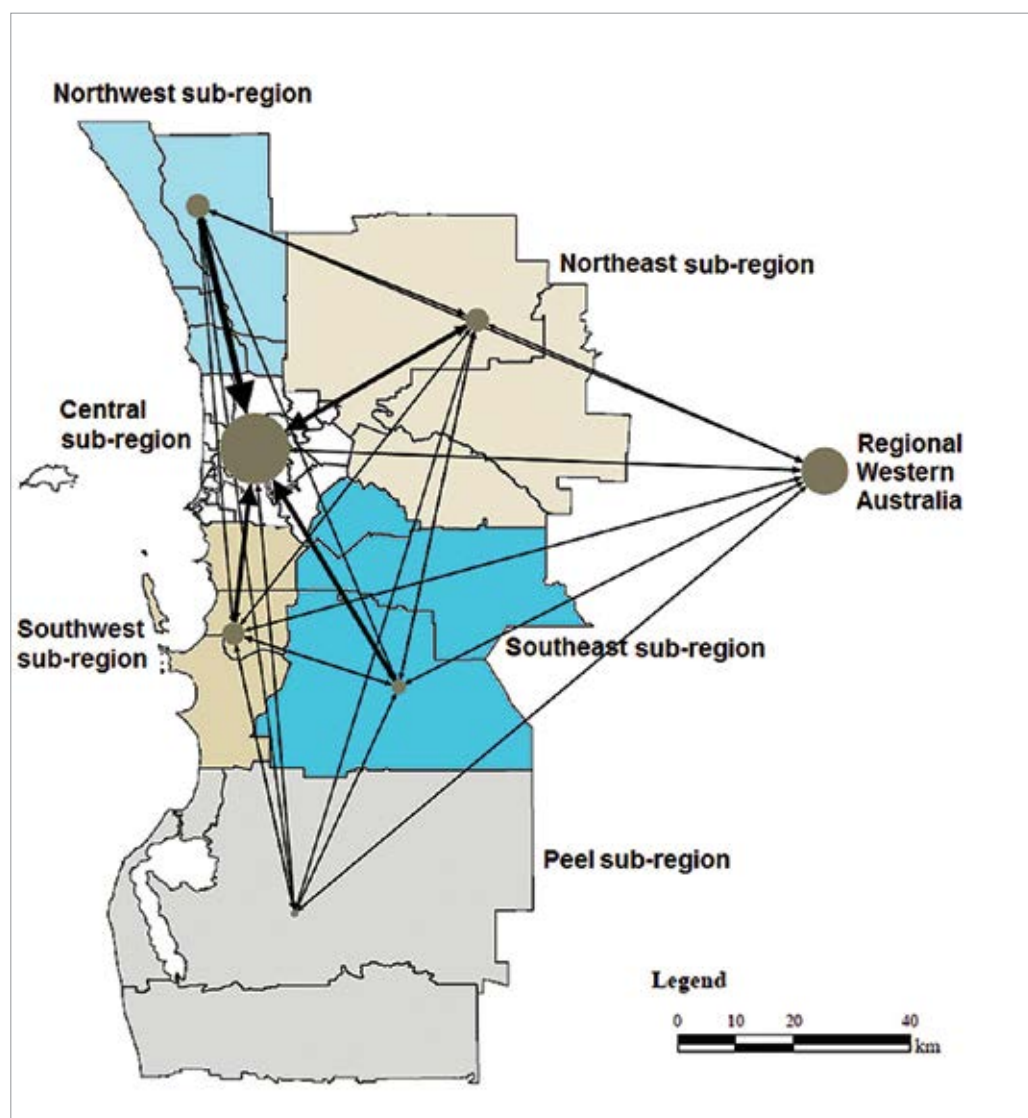


The Perth CBD remains the primary commuting destination in Western Australia, attracting by far the highest number of workers (123,440) compared to its resident working population (8,496). Other local government areas where the number of jobs outstrips resident worker numbers are: Belmont, Subiaco, Canning, Fremantle, Nedlands and Victoria Park (Martinus & Biermann, 2016).

At a sub-regional level, the Central sub-region has substantially more employment opportunities than any of the other sub-regions, drawing workers primarily from immediately adjacent areas. This is followed by regional Western Australia, with 23,852 jobs filled by workers coming from the metropolitan region, and then the three outer metropolitan sub-regions of Northwest, Northeast and Southwest (Martinus & Biermann, 2016).

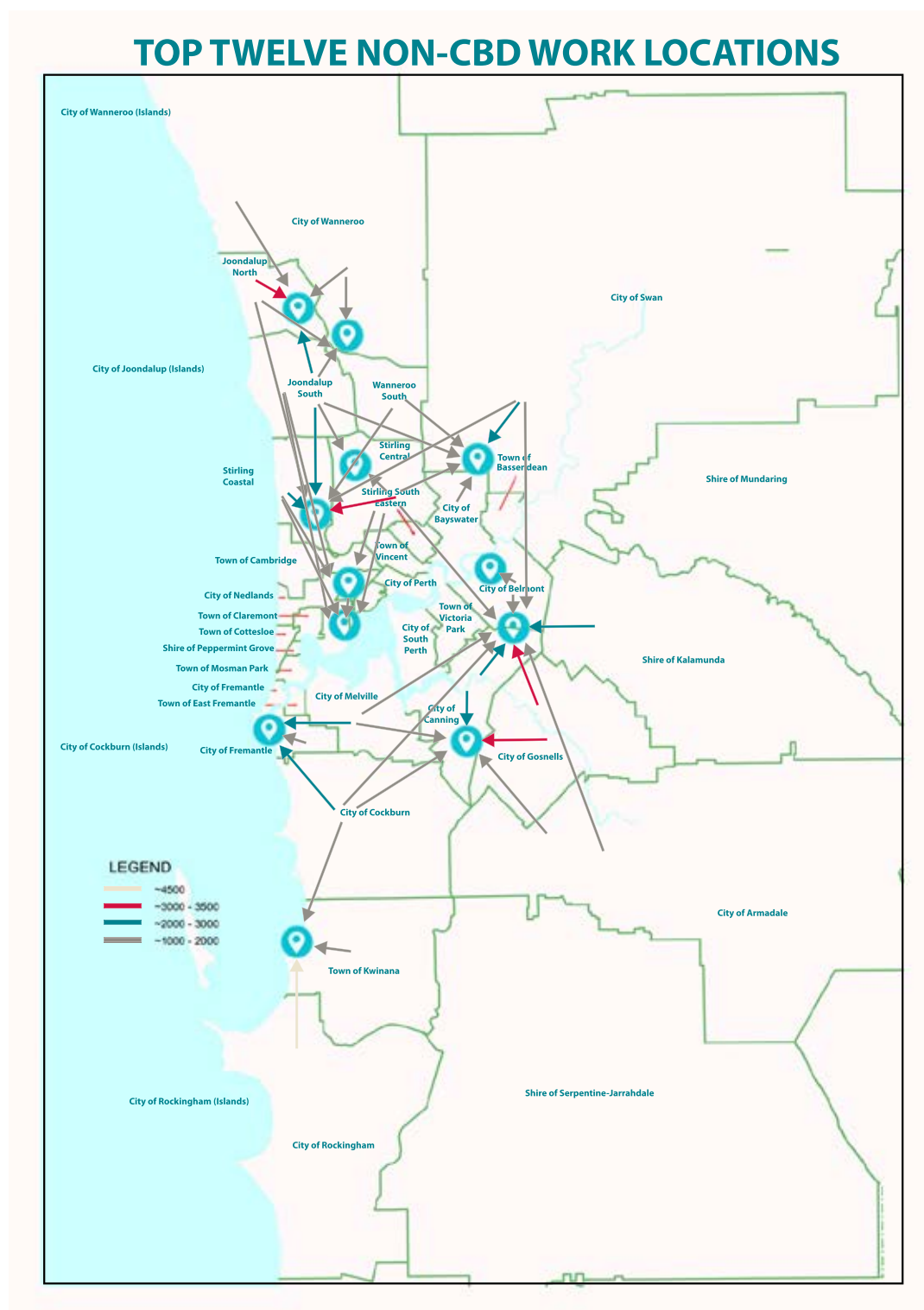
The majority of the commuter flows into the outer sub-regions are from those living in the Central sub-region, with only the Northwest and Northeast sub-regions demonstrating significantly higher cross commuting flows (Martinus & Biermann, 2016).

**Figure 4c: Commuting Flows by Sub-Region**  
(Source: Martinus & Biermann, 2016).



Commuting patterns to non-CBD locations show more cross-sub-regional movements than commuting to the CBD and major commuter origin locations for non-CBD locations are usually on the same side of the Swan River (i.e. north or south). This differs from commuting to the CBD, which draws large numbers of commuters from all sub-regions. Figure 4d illustrates commute patterns to the top 12 non-CBD work locations from major commuter origin locations.

Figure 4d: Top Twelve Non-CBD Work Locations: Commuter Flows from Major Origins (Source: Department of Transport, 2016a).



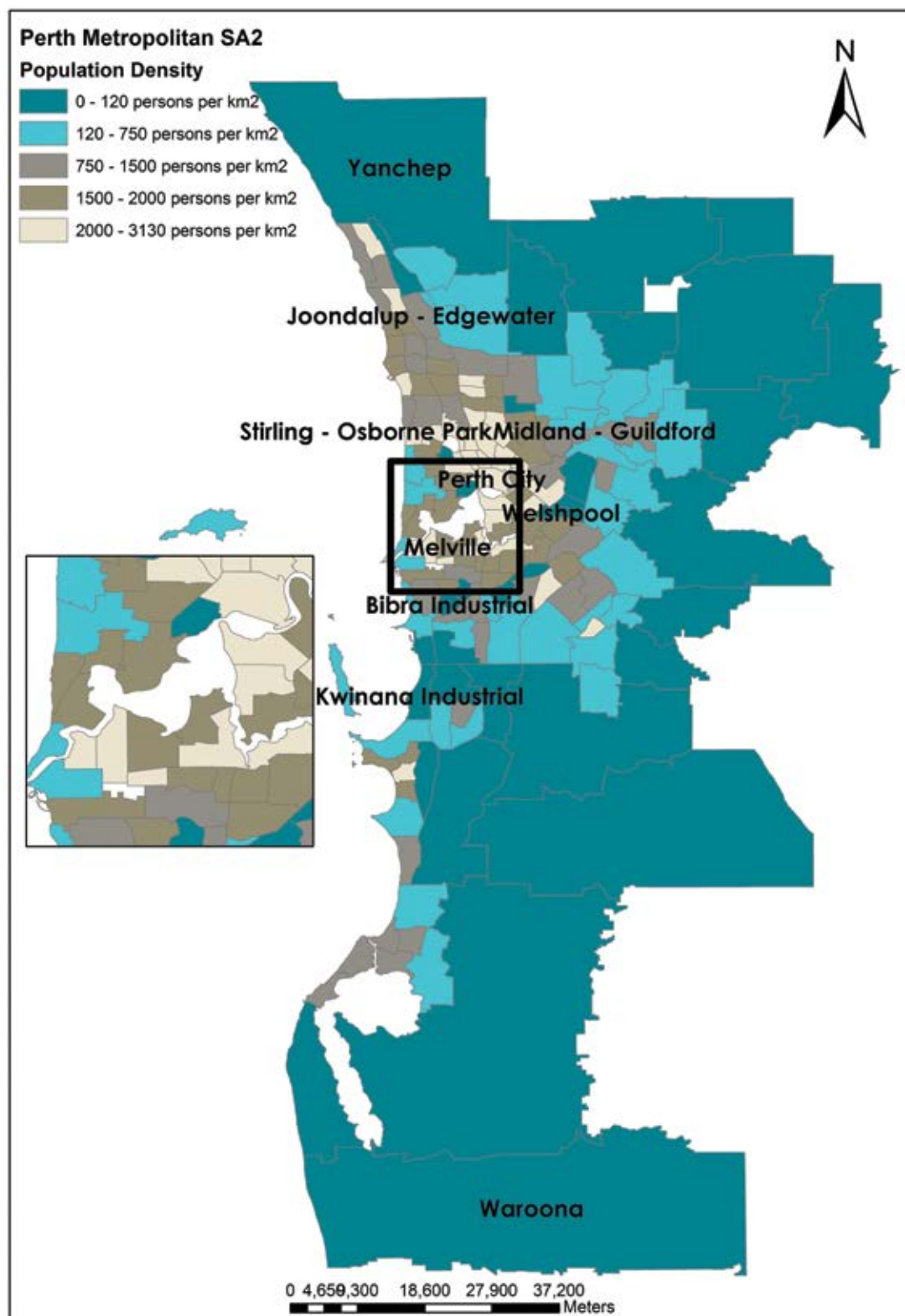
#### 4.4 Urban Form and Density

The distance commuters travel and the time people spend travelling to work is also influenced by the characteristics of the city or suburb they live in. Higher density housing can minimise the total urban footprint of a region and enable more people to live close to work, reducing total possible commute distances. This increases the potential for people to travel by public transport, walking and cycling but can also be associated with increased traffic congestion. By contrast, low-density regions are characterised by single residential housing but also longer travel distances; increased car use; low levels of public transport use and higher total costs of operating urban passenger transportation systems (Kenworthy & Laube, 1999).



The Perth and Peel region is primarily low-density. As outlined in Section 3 of this report, this is a result of long-term strategic planning objectives to deliver land and housing to meet community preferences for stand-alone houses and low-density lifestyles. For the most part, higher population densities are found in central locations and lower population densities in outer locations, although patterns of population density in Perth and Peel are becoming more dispersed, as illustrated in Figure 4e. This is an outcome of strategies for urban consolidation and infill development.

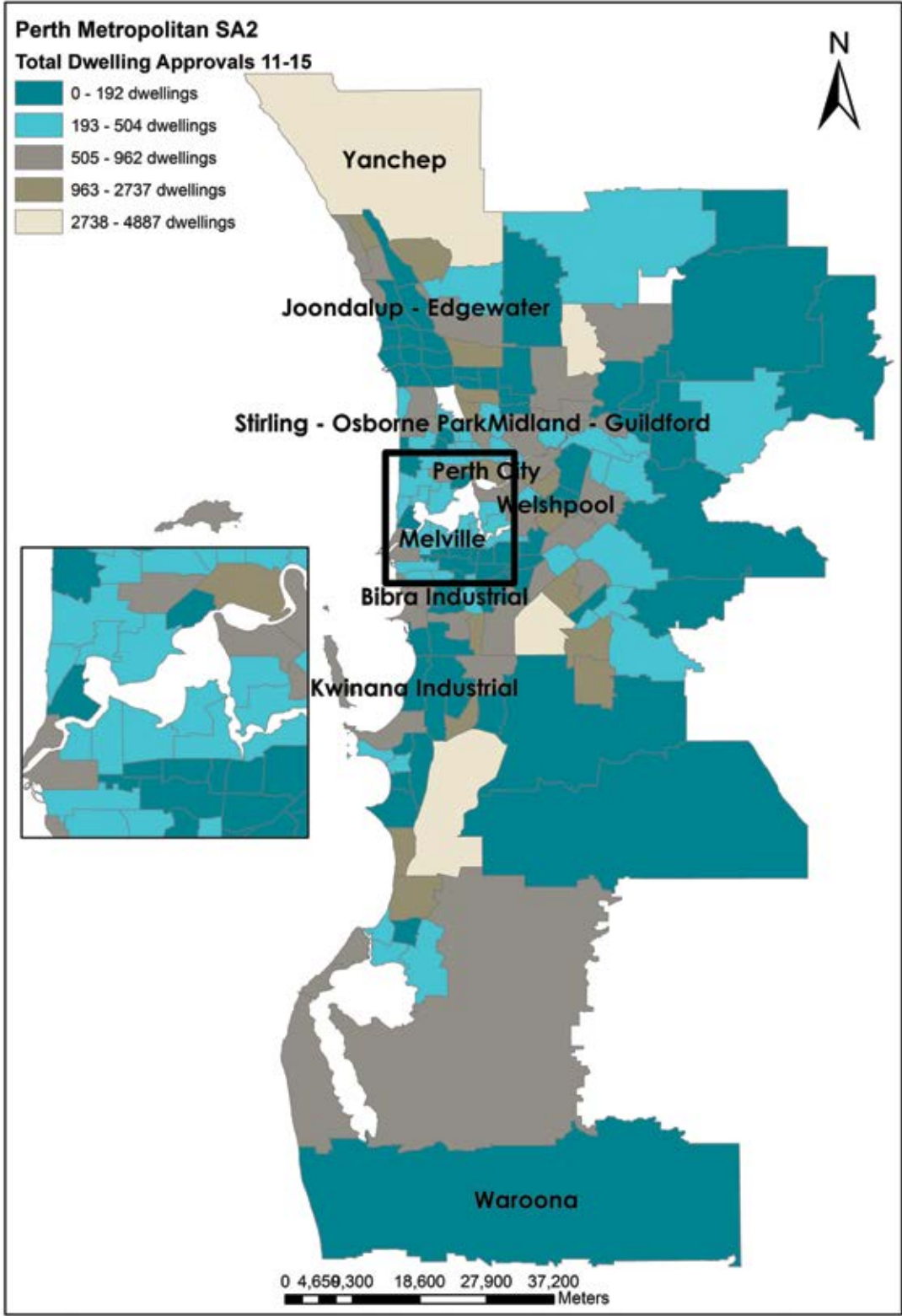
**Figure 4e: Population Density by Statistical Area Level 2 in Perth and Peel 2011 (Source: ABS, 2011).**





This pattern of growth has been maintained, as illustrated in Figure 4f, which shows that the majority of building approvals for the period 2011 to 2015 are in outer or middle locations. The Perth CBD is the only central location that has attracted a substantial proportion of new development.

Figure 4f: Location of Building Approvals 2011-2015 (Source: ABS, 2015).



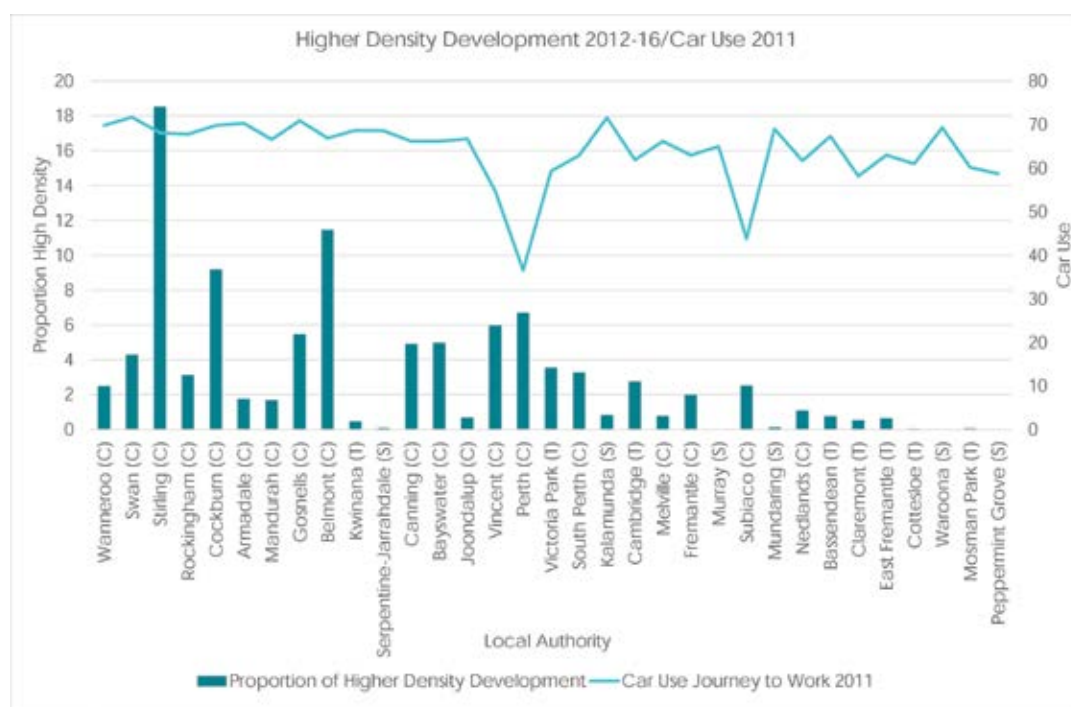
While population densities are becoming more dispersed, evidence shows that most new houses being developed in Perth and Peel are single residential. In 2011, 77% of housing in Perth and Peel was single residential, and between 2011 and 2016, 74% of residential development approvals were for stand-alone houses (Davis & Harford-Mills, 2016).

This indicates that the higher and more dispersed population densities in the region are primarily associated with smaller lot sizes rather than higher-density housing types (such as semi-detached dwellings and apartments) and this is supported by evidence that shows that the average density of new residential development in Perth and Peel remains low, at 10 dwellings per gross urban zoned hectare (17 dwellings per residential site hectare) but the proportion of smaller lots within new residential developments has increased 13% in the past six years (Department of Planning, 2012, p. 20; Department of Planning, 2015a, p. 10).

As a result, the median size of lots approved for development in Perth and Peel from July 2015 to March 2016 was 385m<sup>2</sup> a decline from an average of more than 600m<sup>2</sup> in 2000 (Parliament of WA, 2016). This makes the median lot size for Perth and Peel lower than the median lot size for all major metropolitan regions in Australia, which was 453m<sup>2</sup> in 2015 (UDIA, 2016).

Smaller lot sizes in Perth and Peel have delivered more consolidated development patterns. However the continued dominance of single residential housing in the region is arguably delivering an undersupply of other housing types, most notably medium-density housing (see Section 5.5). Evidence also indicates that the locations in which a majority of new higher-density housing is approved are primarily car dependent, as illustrated in Figure 4g below.

**Figure 4g: Proportion of Residential Building Approvals for Higher-Density Development by Local Government Authority 2012-16/Journey to Work Car Use 2011 (Source: ABS, 2016; ABS, 2011).**



## 4.5 Relationship between Population and Employment Density and Mode Choice

The population densities of residential and employment locations also impacts on commuter mode choices.

### 4.5.1 Population density

In Perth and Peel, the majority of commuters travel by car. However, as shown in Figure 4i, people who live in outer areas are more likely to travel by car than residents of inner areas. There is also a positive relationship associated with living in an area with higher population densities and commuting by public transport. This is shown in Figure 4h.

**Figure 4h: Relationship between Population Density and Public Transport Use**  
(Source: ABS, 2011).

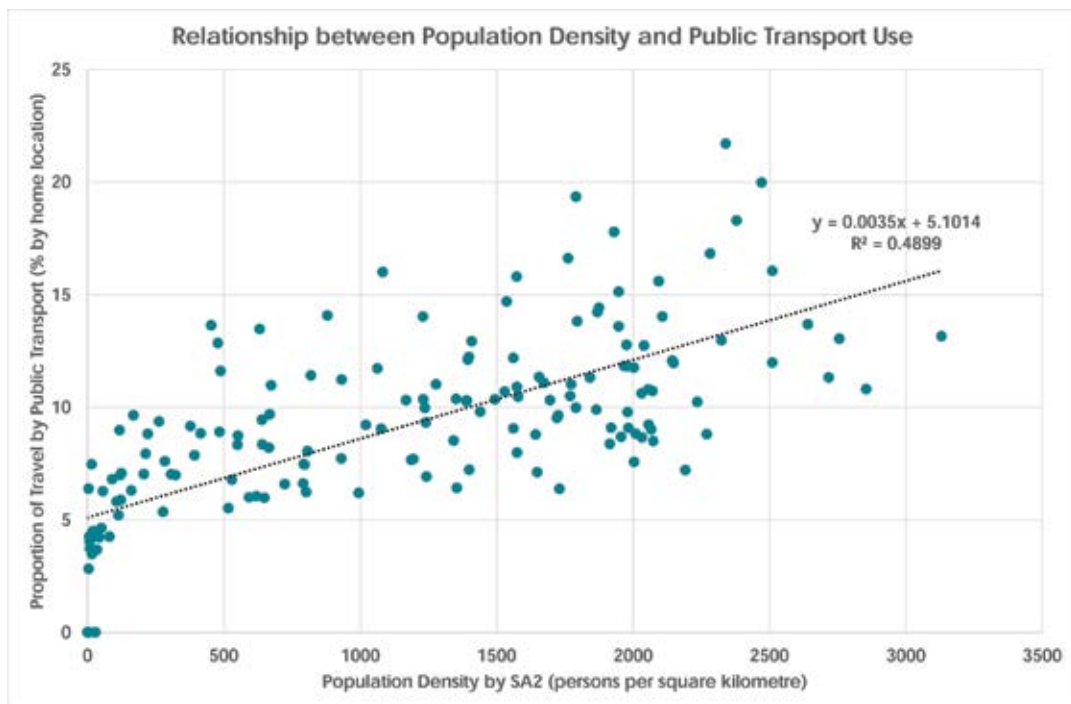
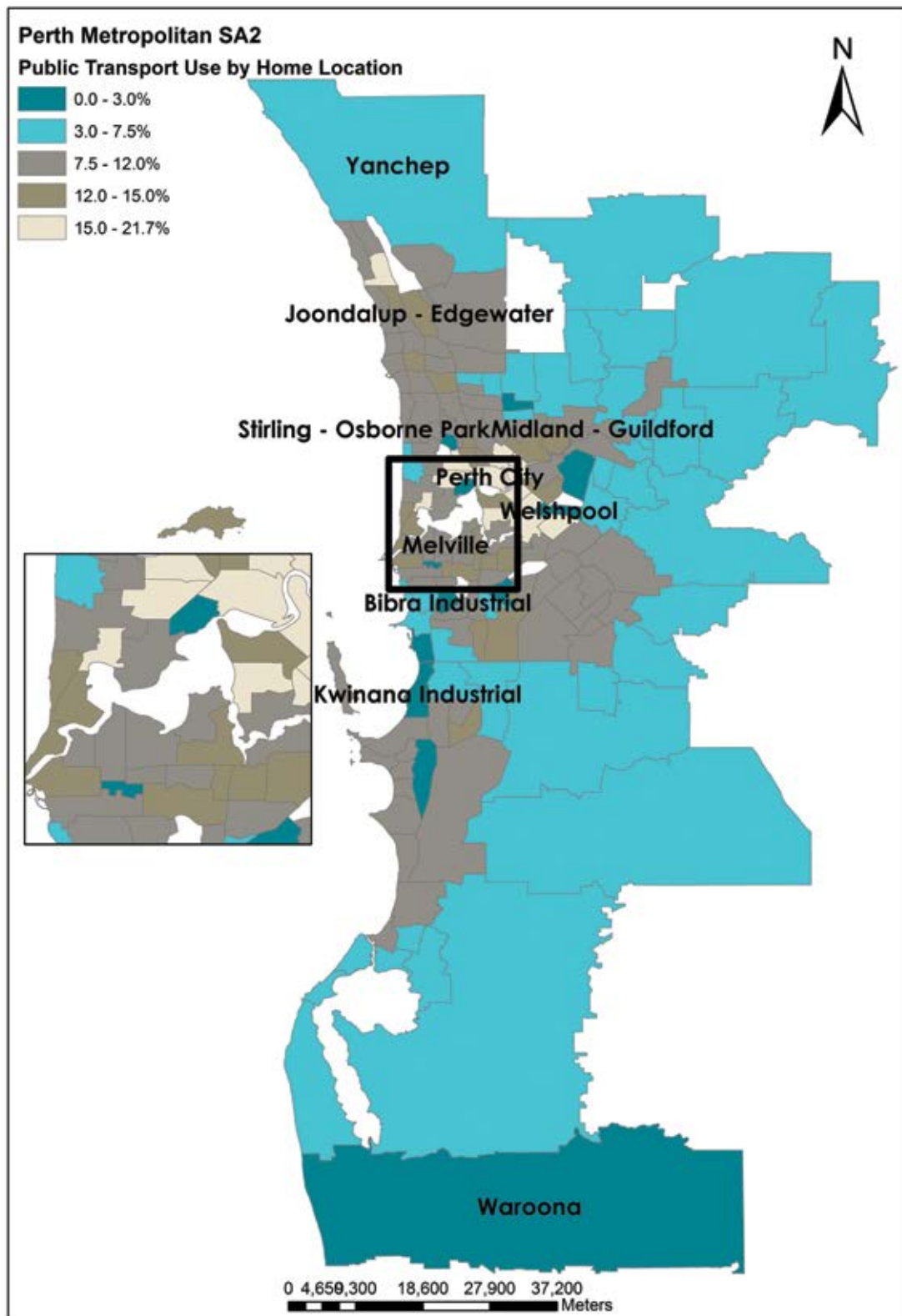


Figure 4i: Public Transport Use by Home Location (Source: ABS, 2011).

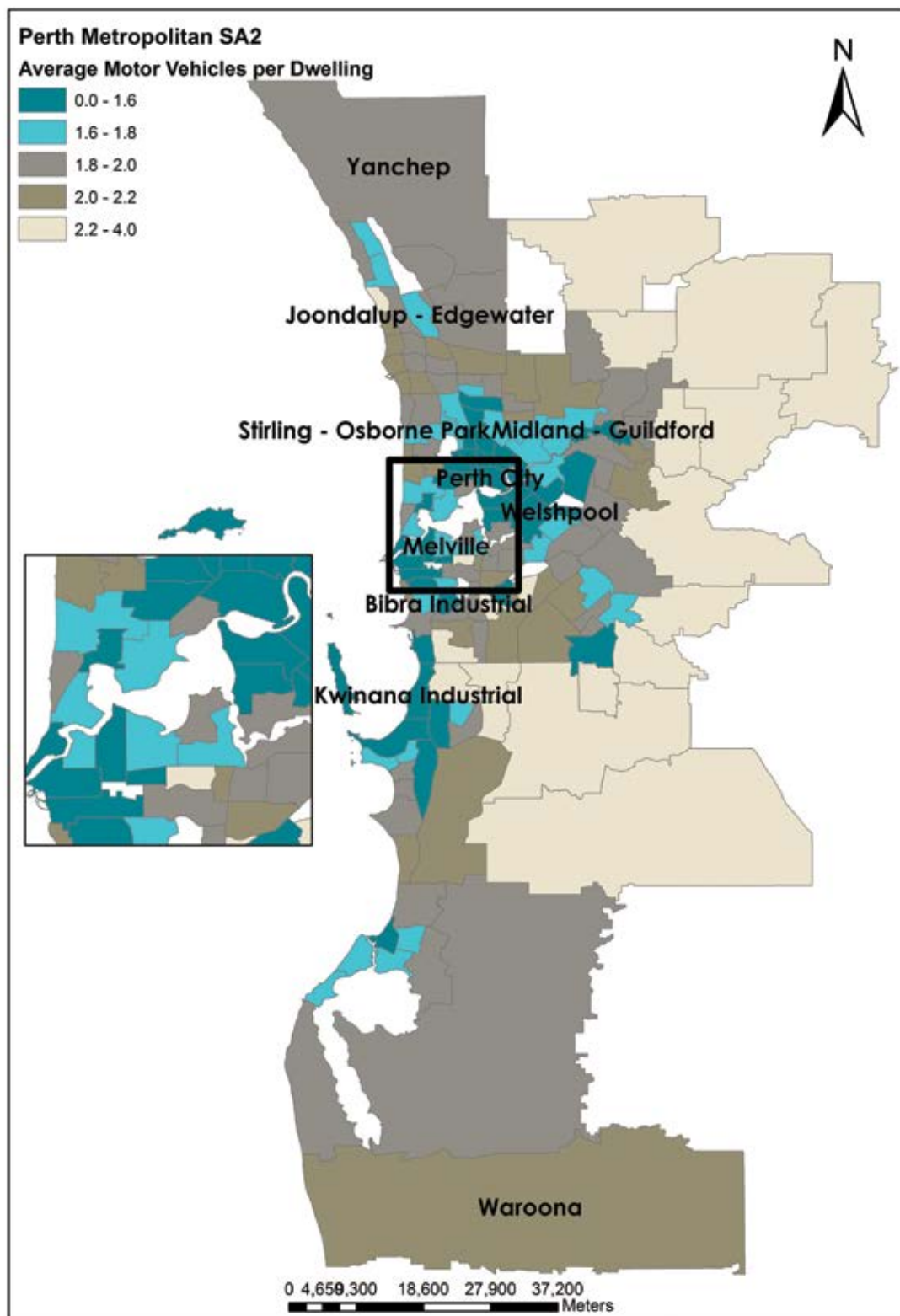


As a result, statistics show that, for the most part, public transport use by residents is higher in the Perth CBD and in areas within approximately 5km of the Perth CBD. Statistical areas in which 15% or more residents travel to work via public transport include Bayswater-Embleton-Bedford; Claremont; Mt Lawley-Inglewood; Perth City; Subiaco-Shenton Park; Wembley-West Leederville; Clarkson; Cannington-Queens Park, Bentley-Wilson-St James; Victoria Park-Lathlain-Burswood; Como; and East Victoria Park – Carlisle (ABS, 2011).

There are nodes of higher public transport use by residents in outer areas (such as Clarkson) which appear to be influenced by population density as well as accessibility (i.e. public transport use is higher in areas from which a large proportion of jobs can be accessed by public transport).

Public transport use is also known to be influenced by car ownership, and ABS data indicates that, generally, car ownership per household is lower in inner locations (most notably the Perth CBD) and in areas accessible by public transport than in outer, less accessible locations.

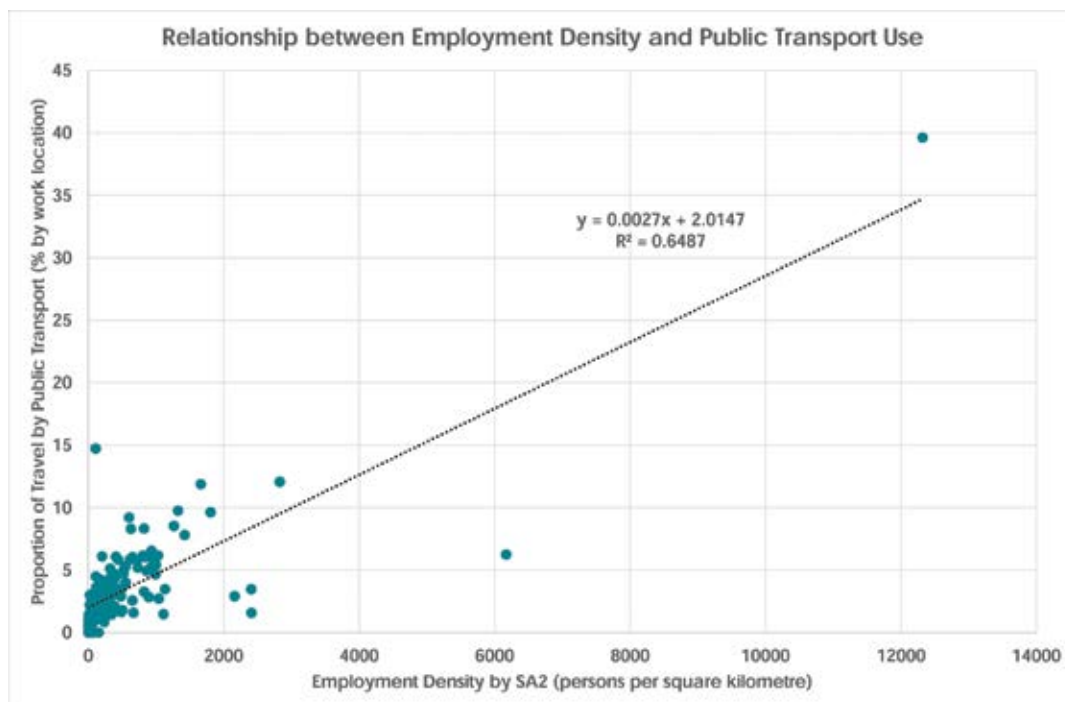
Figure 4j: Vehicle Ownership per Household (Source: ABS, 2011).



#### 4.5.2 Employment density

Evidence also shows that choosing to travel by public transport in Perth and Peel is strongly destination driven. This means that the physical densities and characteristics of work locations have a significant impact on whether people choose to commute by public transport. In particular people in Perth and Peel are far more likely to commute by public transport if they work in the Perth CBD. This is illustrated in Figure 4k below, which shows a statistically significant positive relationship between employment density and public transport use by workers.

**Figure 4k – Relationship between Employment Density and Public Transport Use (Source: ABS, 2011).**

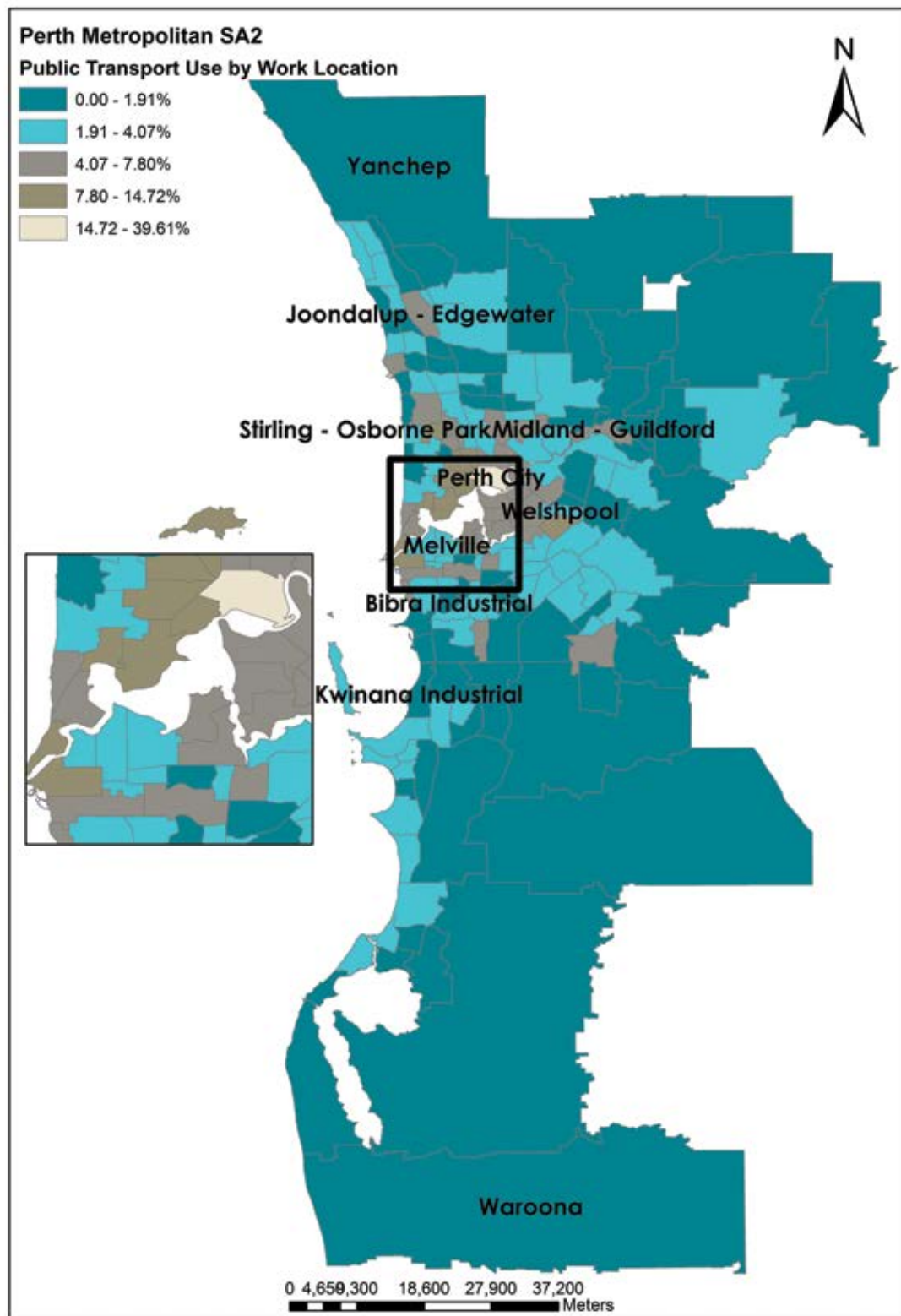


However the relationship is skewed by the Perth CBD and when the Perth City SA2 is removed, the relationship between employment density and public transport use is less significant ( $R^2=0.2423$ ). It is also evident that not all areas with above average employment densities attract higher than average public transport users.

Employment destinations that do exhibit high journey to work public transport use (by working population) include the Perth CBD (inner and outer); Subiaco-Shenton Park; Mt Hawthorn-Leederville; Claremont; Fremantle and Cannington. Major universities, namely The University of Western Australia, Curtin University and Murdoch, also attract large numbers of public transport users. Some locations with higher than average employment densities (such as Malaga) attract relatively low proportions of public transport trips.



Figure 4I: Public Transport Use by Work Location (Source: ABS, 2011).



This indicates that the capacity for employment destinations to be strong public transport hubs is associated with employment density and spatial location but that other factors also play a role such as public transport accessibility and employment type.



In particular, observations of the employment characteristics of SA2s suggest a relationship between the type of industry located within the activity centre and public transport use i.e. workers are more likely to travel by public transport to locations characterised by tertiary employment rather than secondary and primary employment types.

This is further supported by the findings of the *Get a Move On!* Commuter Survey, outlined in Section 8 which indicate that white collar workers are more likely to be public transport users, and less likely to need their car at work than workers in other professions such as construction or manufacturing.

**Table 4c: Public Transport Use by Workers in Top 10 Employment SA2s by Employment Density (Source: ABS, 2011).**

SA2	Employment Density (persons per square kilometre)	Public Transport Use (%)	Primary Employment Type
Osborne Park Industrial	6169	6.2	Tertiary/Secondary
Subiaco - Shenton Park	2828	12.1	Tertiary
Malaga	2409	1.6	Secondary
O'Connor (WA)	2406	3.5	Secondary
Welshpool	2162	2.9	Secondary
Nedlands - Dalkeith - Crawley	1807	9.6	Tertiary
Mount Hawthorn - Leederville	1662	11.9	Tertiary
Victoria Park - Lathlain - Burswood	1424	7.8	Tertiary
Claremont (WA)	1324	9.6	Tertiary
Wembley - West Leederville - Glendalough	1265	8.5	Tertiary

#### 4.5.3 Employment and population density

Newman and Kenworthy (2006) identified through international research that a population density of approximately 35 people per hectare (3,500 people per square kilometre) is required in order to significantly reduce automobile dependence and support public transport use. This density can be made up of people living and/or working in an area.

Research undertaken as part of *Get a Move On!* has found that when the employment and population densities of SA2s in Perth and Peel are combined, there are a total of seven locations that meet the minimum 35 people per hectare density requirement. These locations are all inner locations (within approximately 8km of the Perth CBD) and are the SA2s of Perth CBD, Osborne Park Industrial, Subiaco-Shenton Park, Mount Hawthorn-Leederville, Wembley-West Leederville-Glendalough, Nedlands-Dalkeith-Crawley and North Perth. Most of these areas also exhibit public transport use by home or work location that is higher than the regional average.

<sup>1</sup> The **tertiary** sector of the economy (also known as the service sector or the service industry) is one of the three economic sectors, the others being the secondary sector (approximately the same as manufacturing) and the primary sector (agriculture, fishing, and extraction such as mining).

## 4.6 Job Type

As outlined in Table 4c, commuting patterns and mode choices are not only influenced by the spatial structure and density of employment and residential land uses but also by the location and concentration of different employment types.

In Perth and Peel, it is evident that specific employment locations act as hubs for different types of industry based on the characteristics of the location and the industry requirements. The locational requirement of specific industries are outlined in Section 6 of this report.

The characteristics of different employment locations, and the types of activity they accommodate also impact on their ability to act as hubs of productivity and as effective public transport destinations. The following series of maps provides a snapshot of the size, major industry sector, public transport use and labour productivity of key employment destinations (by SA2) in Perth and Peel. The data that underpins these maps is provided at Appendix 1.

Together the maps and data indicate that highly productive knowledge hubs are most often in central locations and accommodate large numbers of employees. Industrial and retail hubs are primarily in middle and outer locations. Industrial employment locations are of substantial significance from an employment, economic and productivity perspective, but are less successful as public transport hubs.

The data also shows that service sector hubs with large numbers of employees, particularly professional scientific and technical service sector; health; and education destinations are most likely to attract significant proportions of public transport use among workers, followed by retail destinations. It is noted that public transport use by workers does not include public transport use by students and other users (which is known to be significant, particularly at destinations that accommodate major education institutions). For the most part, very high levels of public transport use among workers corresponds with higher than average public transport use by residents (see Section 4.5).

Figure 4m: Main Industry of Employment and Public Transport Use by SA2  
(Source: ABS, 2011).

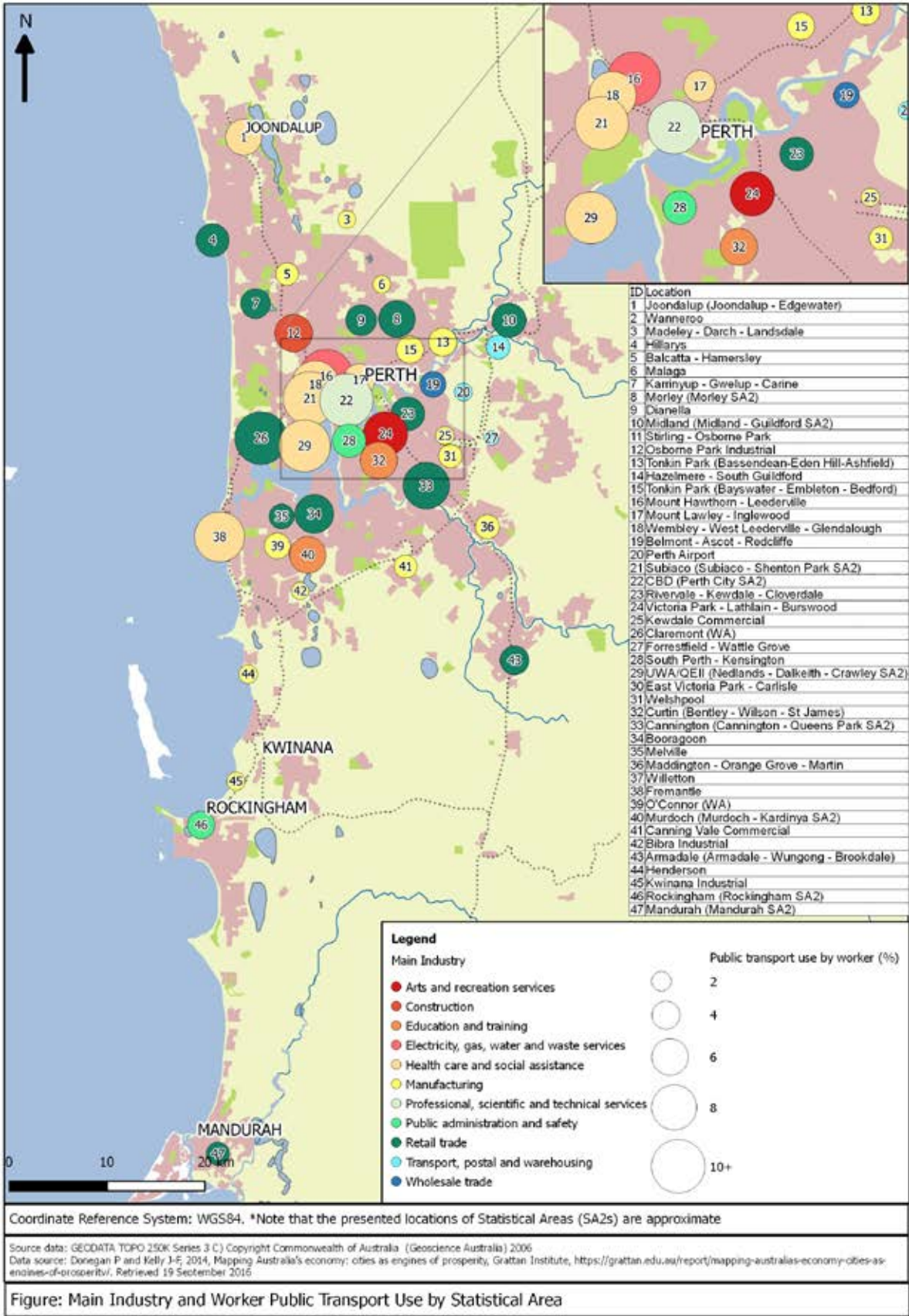


Figure 4n: Main Industry of Employment and Number of Employees by SA2  
(Source: ABS, 2011).

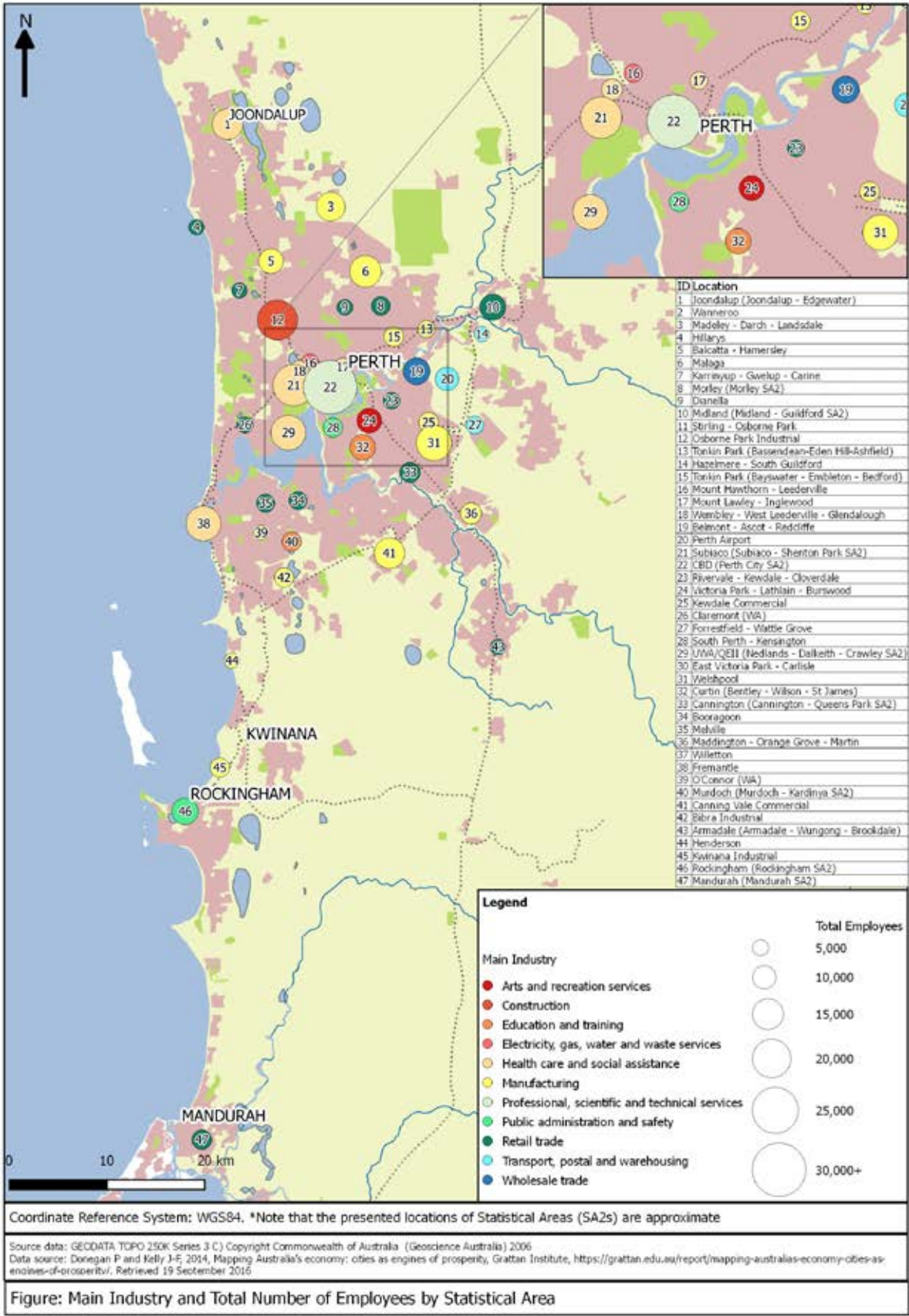
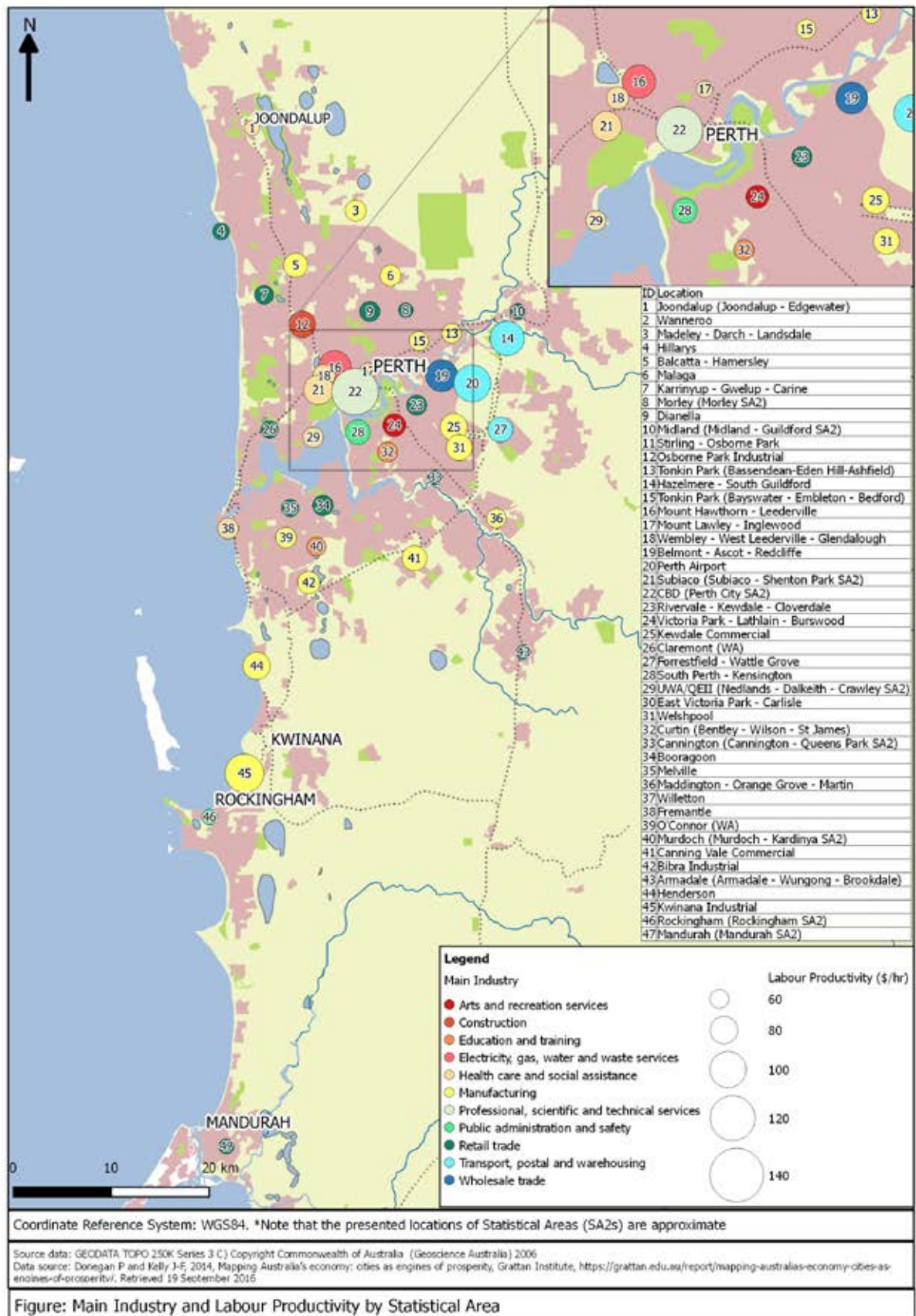




Figure 4o: Main Industry of Employment and Labour Productivity by SA2  
(Source: ABS, 2011; Donegan & Kelly, 2014).



## 4.7 Company Headquarters

FACTBase Bulletin 47 (Martinus et al, 2016) provided additional, critical insights into the location of employment by industry type in Perth and Peel. This work firstly mapped the locations of the headquarters and branch office locations of some of Australia's largest and most globally-oriented firms – those listed on the Australian Securities Exchange (ASX). Secondly it disaggregated industry of employment from the Australian Bureau of Statistics' (ABS) 2011 Census of Population and Housing with commuter destinations.

It found that Perth CBD remains the dominant location for listed and headquartered companies in Western Australia, accounting for 58.1% of ASX listed firms. These firms are concentrated primarily in three sectors: materials at 66.5 % of ASX offices, energy 18.5% and finance 4.1%.

Outside of the Perth CBD, Subiaco-Shenton Park had the most headquarters with 16.4 per cent of all headquartered firms. Of these, 80 were in the materials sector (69%) and 24 in energy (20.7%).

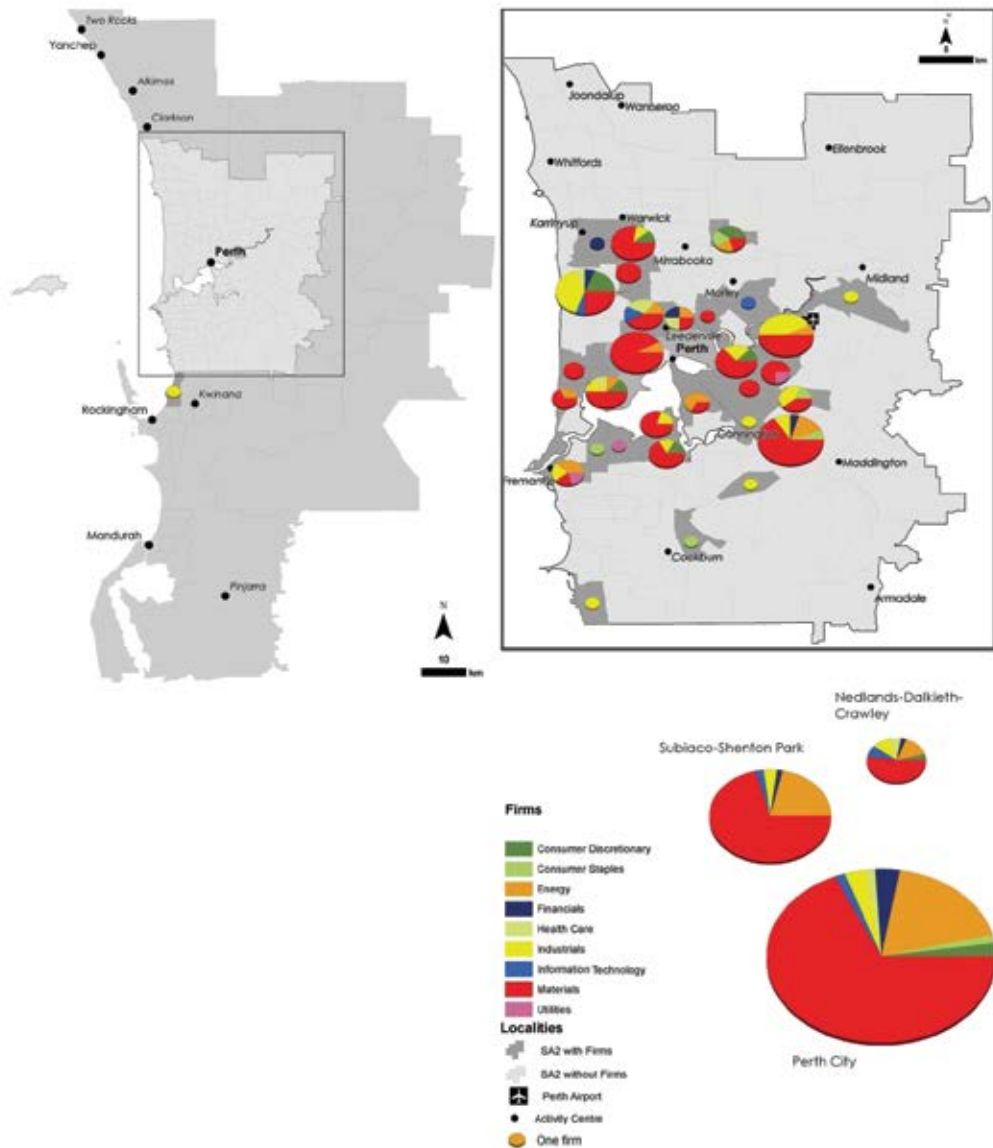
Excluding the Perth CBD and Subiaco-Shenton Park, the number of headquarters in non-CBD locations was low. The next highest locations were Nedlands-Dalkeith with 27 headquarters, South Perth-Kensington with 20 and Osborne Park with 16.

This paints an overall picture of a highly concentrated group of corporate headquarters with the majority in locations within approximately 8km of the Perth CBD. This is not dissimilar to other major Australian cities, where the central business district remains the preferred locational choice for most listed headquarters. The spatial distribution is ASX headquartered offices in Perth and Peel is mapped in Figure 4p.



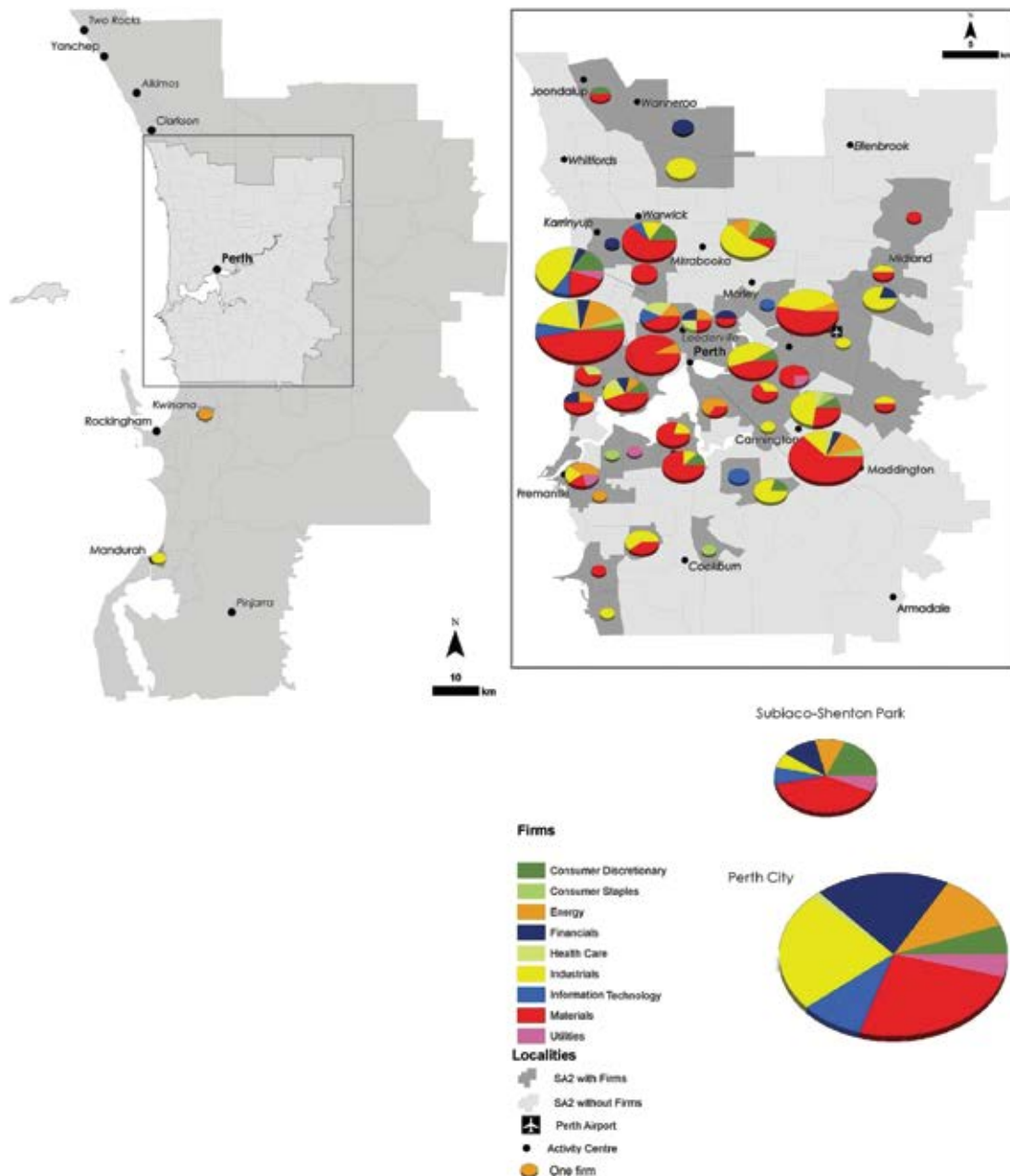


Figure 4p: Total Headquarter Office Locations of ASX-Listings at January 2014, Activity Centres are Noted, Size of Circles Relates to Relative Number of ASX Offices (Source: Martinus et al., 2016).



The distribution of major branch offices of listed firms in Perth and Peel also shows that major branch offices of ASX listed companies were located in Perth CBD, again followed by Subiaco-Shenton Park with 17 (9.4 %). However, branch offices tend to be more dispersed, with small concentrations evident in Malaga, Nedlands-Dalkeith, Welshpool and the Bibra Industrial area. The distribution of branch offices is illustrated in Figure 4q.

**Figure 4q: Total Branch Office Locations of ASX-Listings at January 2014, Activity Centres are Noted, Size of Circles Relates to Relative Number of ASX Offices (Source: Martinus et al., 2016).**



When headquarters and branch offices are taken together, the inner metropolitan corridor between Fremantle and Perth CBD to Perth Airport contains the majority of all ASX offices, at around 87%. Most of these are in the materials sector with some areas also specialising in energy.

The number of ASX headquarters and branch offices diminishes with increasing distance from Perth CBD and middle ring locations around the metropolitan core are home to a large number of industrials. When SA2 locations were examined by dominant industry of employment, the most striking feature identified was the primacy of the Perth CBD for commuters, particularly in the industries of professional, scientific and technical services (PSTS) and mining. There were also a significant number of workers in PSTS in Subiaco-Shenton Park.

The data also showed that manufacturing employment is most highly concentrated in the corridor between the sea and air ports. Henderson, Kwinana Industrial, Bibra Industrial, Canning Vale Commercial and Welshpool, with Madeley-Darch-Landsdale and Malaga, are significant centres to the north, while strategic activity centres of Joondalup, Midland-Guildford, Mandurah, Cannington and Morley, along with the outer metropolitan light industrial area of Madeley-Darch-Landsdale, are important retail employment areas.

Together this provides a picture of a region with a strong core of global knowledge sector industries which forms a diamond shape from Fremantle to Osborne Park in the north, Perth Airport in the east and Murdoch in the south.

#### 4.8 Benefits of Central Locations for Knowledge Sector Employers

Central high-density employment locations are known to offer major strategic advantages for 'knowledge' or professional, scientific and technical services industries. These benefits include the concentration of strategic sources of information; the presence of self-reinforcing informal and formal knowledge networks; the presence of skilled and professional labour markets; and radial transport systems, which reinforce centralisation (Tonts & Taylor, 2010).

Central locations are also more suited to professional, scientific and technical service sector employers because these sectors tend to use less land per employee and are co-dependent (i.e. 'every bank needs advertising, every advertising firm a bank account'). These firms therefore benefit from spatial proximity to organisations in the same sector and other sectors (Gill & Goh, 2010).

As a result while outer activity centres provide lower cost land, and in some cases better infrastructure than central locations, for professional, scientific and technical service sector employers any potential benefits of decentralisation seem to be outweighed by the ongoing advantages of doing 'business in the core' (Martinus, 2016; Tonts & Taylor, 2010).

#### 4.9 Benefits and Costs of Centralised Activity in Perth and Peel

There is a considerable body of work highlighting the benefits of employment agglomeration or 'economies of scale' on economic activity and productivity and it is estimated that economic density increases labour productivity by three or more per cent (Crawford, 2006). The *Get a Move On!* Business Interview findings (see Section 8) indicate that major businesses are keenly aware of these benefits.

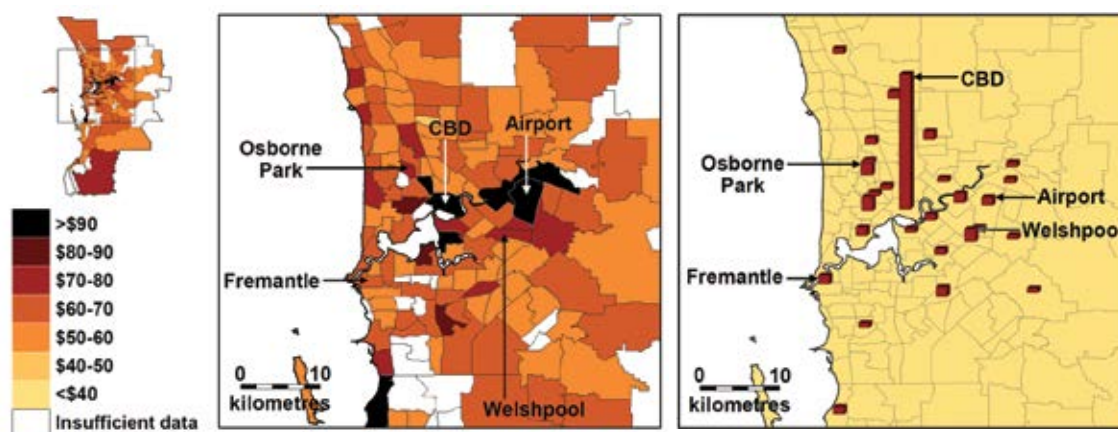
As outlined in Sections 4.6 and 4.7, knowledge-intensive and specialised service industries such as mining (including accountants, administrators, geologists and specialist engineers), health and life sciences and international education locate in the CBD or central locations.

These businesses depend on highly skilled workers, and locating centrally gives them access to the largest possible pools of potential employees. Proximity to suppliers, customers and firms within the same and different sectors also helps businesses to work efficiently, to generate opportunities and to stay up to date with current ideas (Kelly & Donegan, 2014).

The centralisation of major infrastructure assets (such as ports and airports), key industrial employment areas and knowledge-intensive businesses has resulted in economic activity and productivity being concentrated in central locations.

As shown in Figure 4r and 4s below, CBD and centrally located businesses as well as those adjacent to strategic regional transport infrastructure assets (such as airports) tend to exhibit the highest levels of economic productivity.

**Figure 4r and 4s: Economic activity and Productivity Perth Region**  
(Source: Kelly & Mares, 2013c; Kelly & Donegan, 2014).



Perth's CBD accommodated 17% of jobs but generated \$40.7 billion of economic activity in 2011-12. Other productive areas in the region were Subiaco (\$4.2 billion); the Osborne Park industrial area (\$4.0 billion); Canning Vale (\$2.8 billion); Perth Airport (\$2.5 billion); and Fremantle (\$2.5 billion) (Kelly & Donegan, 2014, p. 15).

However, it is evident that the centralisation of economic activity brings both benefits and costs to the Perth and Peel region (Davis, 2016). These are outlined below.

#### Benefits:

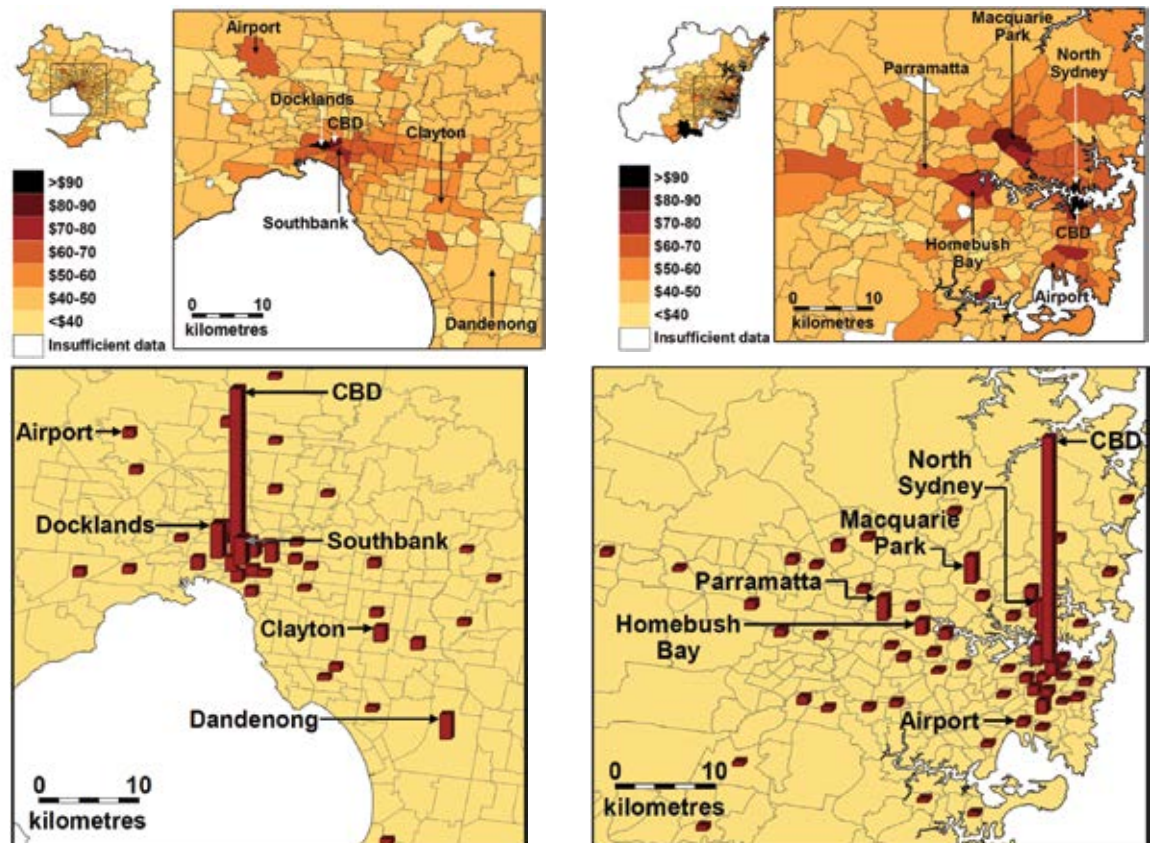
- Ease of access.
- Potential for efficient transport linkages between major central destinations.
- Higher employment densities in the CBD, supporting public transport provision and use.
- Productivity benefits associated with economic agglomeration.
- Potential for accessibility benefits associated with higher density residential development in inner locations.

#### Costs:

- Centralised travel patterns with car dependent non-CBD workforce (i.e. unless people work in the central CBD they are likely to travel to work in central destinations by car).
- Traffic congestion.
- Reduced access to employment from outer suburban locations.
- Low levels of employment diversity in outer locations.
- Low levels of employment self-containment in some outer sub-regions i.e. sub-regions are net exporters of talent.

A comparison of the spatial structures of Greater Perth, Greater Melbourne and Greater Sydney also suggests that patterns of economic activity and productivity remain centralised and CBD dependent as the population of metropolitan regions grow, even when a more significant proportion of employment is decentralised. Figures 4t to 4w below show that in major Australian metropolitan regions economic activity and productivity remains centralised.

**Figure 4t – 4w: Melbourne and Sydney Economic Productivity and Activity**  
(Source: Kelly & Mares, 2013a; Kelly & Mares, 2013b; Kelly & Donegan, 2014).



The Sydney region has successfully decentralised a significant proportion of white-collar employment out of the CBD but it remains close to the CBD, most notably in North Sydney and Macquarie Park. Major knowledge/professional, scientific and technical service employment centres appear to be difficult to establish more than approximately 20km from a CBD location and require strong connections to existing CBD locations.

#### 4.10 Activity Centres

As part of the *Get a Move On!* project, an assessment has been undertaken to identify the role of significant employment destinations in Perth and Peel, through an investigation and analysis of centres that employ over 4,000 of Perth and Peel residents using ABS SA2 data. These centres were examined using the following criteria:

- Total employed.
- Population.
- Vehicle ownership.
- Public transport use (both residents and workers).
- Economic activity.
- Labour productivity.
- Primary, secondary and tertiary industry of employment.



This analysis informed a delineation of the roles between the various employment centres throughout the metropolitan region, in order to maximise the use of road, public and active transport networks. The recommendations create a hierarchy of centres as follows:

- Capital City.
- Knowledge/Professional/Health Hub.
- Urban Village.
- Sub-regional Service Centre.
- Industrial Centre.

The data used to designate each of the employment centres is provided at Appendix 1.

Perth CBD is the Capital City and the heart of economic activity. Benefits associated with a strong CBD include productivity through economic agglomerations, high levels of accessibility, vibrancy and public and active transport infrastructure use. Businesses in Perth and Peel identified a desire to be located in the CBD, with most major professional based employment providers indicating long-term permanency.

Knowledge/Professional/Health Hubs are activity centres in Perth and Peel that have the highest potential to act as major knowledge/professional/health sector employment and public transport destinations within a 20 year timeframe. These are Subiaco, UWA/QEII, Fremantle, Curtin/Bentley Technology Park, Joondalup and Murdoch and each contain:

- Over 7,000 total employees.
- Over 4,000 employees in knowledge, professional or health based employment industries.
- A major university or higher education campus, with the exception of Subiaco.
- Over 12,000 local residents who use public transport to get to work more than the Greater Perth average.

Urban Villages are employment centres located within five kilometres of the CBD that have the potential to increase population in order to support a turn up and go public transport system and facilitate greater uptake in active commuting. They include Victoria Park, Burswood, Wembley, West Leederville, South Perth, Mount Hawthorn, Leederville and Mount Lawley which are characterised by:

- Over 6,000 total employees.
- Over 10,000 local residents.
- Lower levels of vehicle ownership (not exceeding 1.6 vehicles per dwelling).
- More residents who use public transport to commute than the Greater Perth average.
- Employment generally categorised by arts and recreation, health care and social assistance, retail trade, public administration and safety and professional, scientific and technical services.

Sub-regional Service Centres act as centres to serve their communities and provide opportunities for local employment and retail. They include Rockingham, Midland, Cannington, Mandurah, Morley, Melville, Stirling, Booragoon, Belmont, Claremont, Dianella, Armadale, Karrinyup, Hillarys, East Victoria Park, Wanneroo and Willetton and are characterised by:

- Over 4,000 total employees.
- Primary industry of employment is retail trade (with the exception of Rockingham).
- Employment typically in service based industries including public administration and safety, accommodation and food services, health care and social assistance and education and training.

Industrial Centres require high quality road access and are critical to the State's economy, generating significant economic activity and employing a large proportion of Perth's population. They include Osborne Park Industrial, Welshpool, Malaga, Canning Vale Commercial, Wangara, Belmont, Balcatta, Perth Airport, Maddington, Kewdale Commercial, Tonkin Park, Bibra Industrial, Kwinana Industrial, Forrestfield, Hazelmere – South Guildford, Henderson and O'Connor and are characterised by:

- Over 4,000 total employees.
- Approximately 2,000 or more workers employed in industrial based industries, including construction, manufacturing, transport, postal and warehousing and wholesale trade.
- Low levels of public transport use among workers, typically lower than 4% with the exclusion of Osborne Park Industrial.



## 4.11 Knowledge/Professional/Health Hub Commuter Origins

In order to understand major commuter flows, an analysis was undertaken to determine the origin location of commuters who travel to major Knowledge/Professional/Health Hubs. These commuters have been identified as either currently using or having the greatest potential to be users of the public transport system. The analysis provides information on the top five residential locations of workers by Australian Bureau of Statistics Statistical Local Area (SLA)<sup>2</sup> geographies for each local government area in 2011.

City of Subiaco major commuter origin locations (includes Subiaco and UWA/QEII Hubs):

- Subiaco (C) 2,195
- Stirling (C) – Central 1,858
- Stirling (C) – Coastal 1,799
- Joondalup (C) – South 1,665
- Melville (C) – 1,331

Town of Victoria Park major commuter origin locations (includes Curtin/Bentley Technology Campus):

- Victoria Park (T) 2,795
- Canning (C) 2,595
- Gosnells (C) 2,142
- South Perth (C) 1,416
- Melville (C) 1,406

City of Fremantle major commuter origin locations:

- Cockburn (C) 4,959
- Melville (C) 4,084
- Fremantle (C) – Remainder 3,990
- Rockingham (C) 1,542
- Canning (C) 1,176

City of Melville major commuter origin locations (includes Murdoch university):

- Melville (C) 12,023
- Cockburn (C) 4,415
- Canning (C) 2,647
- Gosnells (C) 1,745
- South Perth (C) 1,065

City of Joondalup major commuter origin locations:

- Joondalup (C) – South 13,504
- Joondalup (C) – North 8,685
- Wanneroo (C) – North-East 3,646
- Wanneroo (C) – North-West 3,567
- Stirling (C) – Central 1,722

<sup>2</sup> SLAs are an Australian Standard Geographical Classification defined area, and can be viewed here: [http://www.abs.gov.au/ausstats/abs@.nsf/be4aa82cd8cf7f07ca2570d60018da27/463f50115b6dcccfbca2571a9001e1f44/\\$FILE/WA.pdf](http://www.abs.gov.au/ausstats/abs@.nsf/be4aa82cd8cf7f07ca2570d60018da27/463f50115b6dcccfbca2571a9001e1f44/$FILE/WA.pdf).

## 4.12 Summary of Key Findings

### Commute Times and Distances

Commute distances in Perth and Peel appear to be increasing and are longest for people who live in outer locations and/or work in outer locations.

As the population of the region grows, travel behaviour and land use patterns will need to adapt so that commute distances and times can remain within a reasonable limit/do not increase exponentially.

### Population and Employment Densities

Patterns of population density in Perth and Peel have become more dispersed over time, with areas of relatively high population densities in some outer locations and lower population densities in some central locations. Outer locations are more likely to be car dependent.

People are more likely to use public transport if they live in an area with high population densities, particularly if the area is centrally located.

Commuters who use public transport are more likely to work in an employment area with high employee densities, and that is also home to tertiary employment sectors.

Employment in Perth and Peel is centralised, yet is relatively low-density, meaning that there are few nodes with adequate employment and population densities to support public transport use. Locations that do have population and employment densities adequate to significantly reduce car dependence include Perth CBD, Osborne Park Industrial; Subiaco-Shenton Park; Mount Hawthorn-Leederville; Wembley-West Leederville-Glendalough, Nedlands-Dalkeith-Crawley and North Perth. Most of these areas have higher than average public transport use among residents or workers and may have capacity for car dependence to be further reduced.

### Patterns of Commuting

The Central sub-region is the primary commuting destination in Perth and Peel.

Most employment in Perth and Peel is located within the Central sub-region, but is relatively dispersed through the sub-region.

### Patterns of Employment and Economic Activity

Patterns of commuting to non-CBD employment locations reflect inward movements of commuters but also some cross-suburban commuting.

The Swan River appears to form a barrier to travel to non-CBD employment locations.

The Perth CBD and Subiaco-Shenton Park areas form the professional service sector and economic and productivity heart of Perth and Peel.

A strong diamond shaped corridor of economic activity and productivity is also evident between Fremantle; Osborne Park in the north; Perth airport in the east; and Murdoch in the south, forming the region's 'global economic jewel'.

### The Pull of Central Locations

Central locations and locations associated with major infrastructure have a strong 'pull' for tertiary employment, particularly for knowledge intensive professional service sector employers who gain major productivity benefits from locating in professional service sector agglomerations.

Economic activity and areas of high productivity are centralised and associated with transport infrastructure such as airports or ports.

The centralisation of economic activity brings costs and benefits with a key benefit being increased productivity.

Major tertiary employment centres are viable when associated with major transport infrastructure; when highly connected to existing CBD locations; and when located within 20km of the CBD. Access to a skilled workforce supports decentralised centres in Greater Sydney.

### Capacity for Strategic Knowledge Centres/Public Transport Destinations

Subiaco; Nedlands-Crawley (UWA and QEII); Curtin University/Bentley Technology Park; Murdoch; Fremantle; and Joondalup have been identified as activity centres to be developed as major knowledge/professional service sector employment locations and public transport destinations within a 20 year horizon.









## Section 5: Impact of Accessibility, Infrastructure Quality, Skill Alignment and Personal Preferences on Commuting in Perth and Peel

Ms Gemma Davis and Ms Georgia Harford-Mills  
Committee for Perth and The University of Western Australia

The spatial structure of employment and residential land uses and industry agglomerations provide the framework for commuting in Perth and Peel. However, commuting patterns, times and distances are also influenced by factors including infrastructure quality and form; traffic congestion; skill alignment between jobs and the local population; and the choices, preferences and characteristics of individuals and households (Cervero, 1995; BITRE, 2013). This Section provides an overview of each of these factors. It has been prepared by the Committee for Perth and refers to FACTBase Bulletins prepared as part of the *Get a Move On!* project.

It shows that employment is currently accessible in the Perth and Peel regions when compared with Sydney and Melbourne however the radial pattern of transport infrastructure and centralised employment structure means that access to employment is highest for people living in inner locations and lowest for people in outer suburban locations.

Accessibility in Perth and Peel is a reflection of the quality of infrastructure, such as the freeway and rail system, which has increased accessibility; reinforced centralised employment patterns; and facilitated the growth of the region in linear form, increasing potential commute distances. Traffic congestion in Perth and Peel is currently less of a problem than in Melbourne or Sydney but is predicted to increase in the future, which would mean longer delays on major roads.

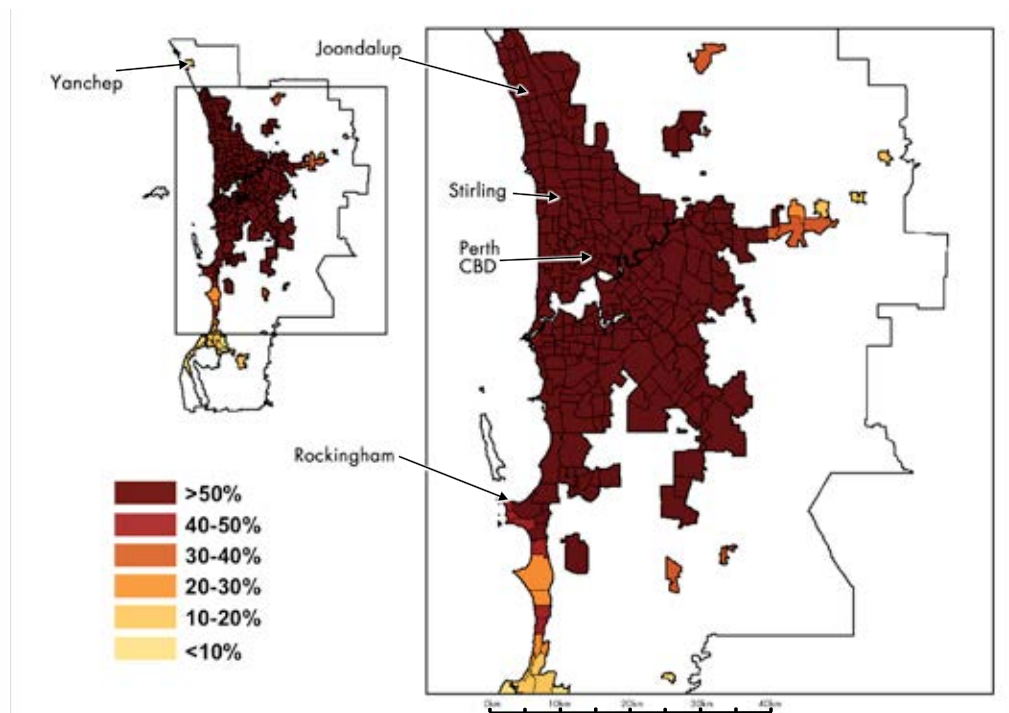
When people commute in the Perth and Peel region they primarily travel from outer residential locations to centralised employment areas, although some workers are 'cross-suburban' commuters. White collar workers such as professionals, managers and clerical administration workers are most likely to travel from outer sub-regions to the Central sub-region because this is where the majority of office, professional and clerical employment opportunities are located. The largest numbers of white-collar workers live in the Central, Northwest and Southeast sub-regions.

## 5.1 Access to Employment from Home Location

Accessibility is a reflection of home and work locations and quality of infrastructure connecting them. In Perth and Peel, residential growth is dispersed; employment centralised; and the public transport system and major road system has a strong radial pattern.

As a result, access by car and public transport is highest to and from central locations and lowest to and from outer locations (see Figure 5a and 5b). In all locations, people are able to access more jobs within a 45-minute car journey (see Figure 5a) than within a 60-minute public transport journey (see Figure 5b) although there are areas of low accessibility, most notably in locations south of Rockingham.

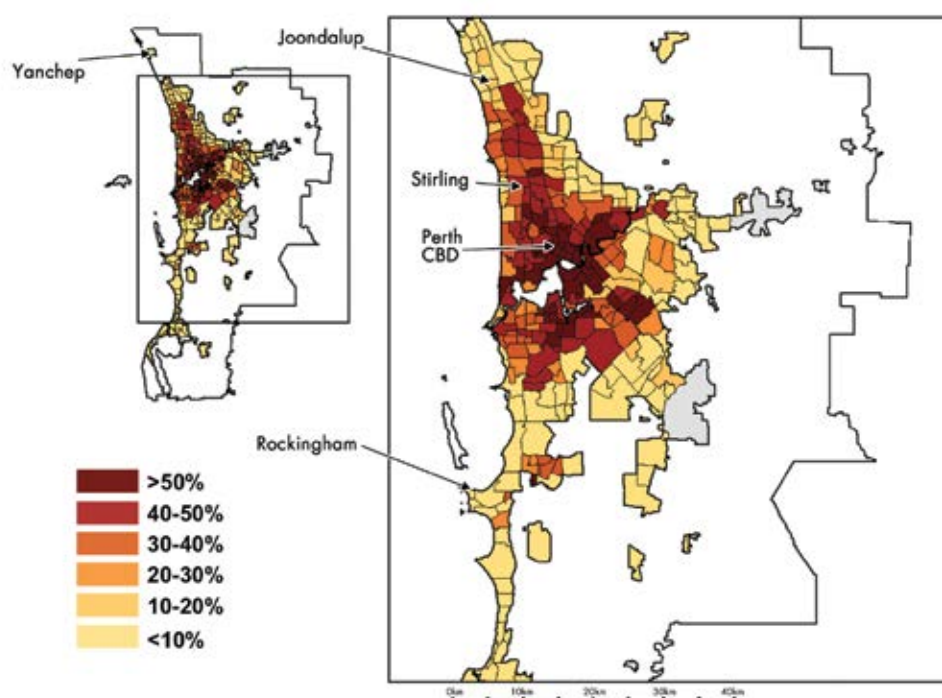
**Figure 5a: Employment Accessibility by Car (Source: Kelly & Mares, 2013c).**



Accessibility by public transport is more limited and patterns of accessibility within a 60-minute public transport commute primarily follow passenger rail routes. In a large proportion of outer locations, fewer than 10% of jobs can be accessed within a 60-minute public transport commute (Davis, 2016, p. 7).

The outcome is that public transport use is significantly higher for journeys to work in CBD locations than in non-CBD and outer locations, and people who live in inner areas and areas that are more accessible by public transport are more likely to use it to travel to work.

**Figure 5b: Employment Accessibility by Public Transport**  
(Source: Kelly & Mares, 2013c).



Employment accessibility by car and public transport is higher in Perth and Peel than in metropolitan Melbourne and Sydney. This is associated with Greater Perth's smaller population and expansive geographical footprint; the quality and speed of rail infrastructure; and the relatively centralised structure of employment (Martinus & Biermann, 2016). Accessibility in Perth and Peel is likely to decline as the region grows outwards.

**Table 5a: Access to Employment in Perth, Melbourne, Brisbane and Sydney**  
(Source: SGS Economics as cited by Kelly & Mares, 2013, p. 29).

	What share of jobs in the entire metro area can CBD residents reach?		What share of the entire metro labour force can CBD-based firms access?	
	By car (45 mins)	By public transport (60 mins)	By car (45 mins)	By public transport (60 mins)
Sydney	53%	53%	23%	37%
Melbourne	90%	46%	45%	34%
Brisbane	79%	61%	54%	42%
Perth	89%	74%	93%	58%

## 5.2 Infrastructure Quality

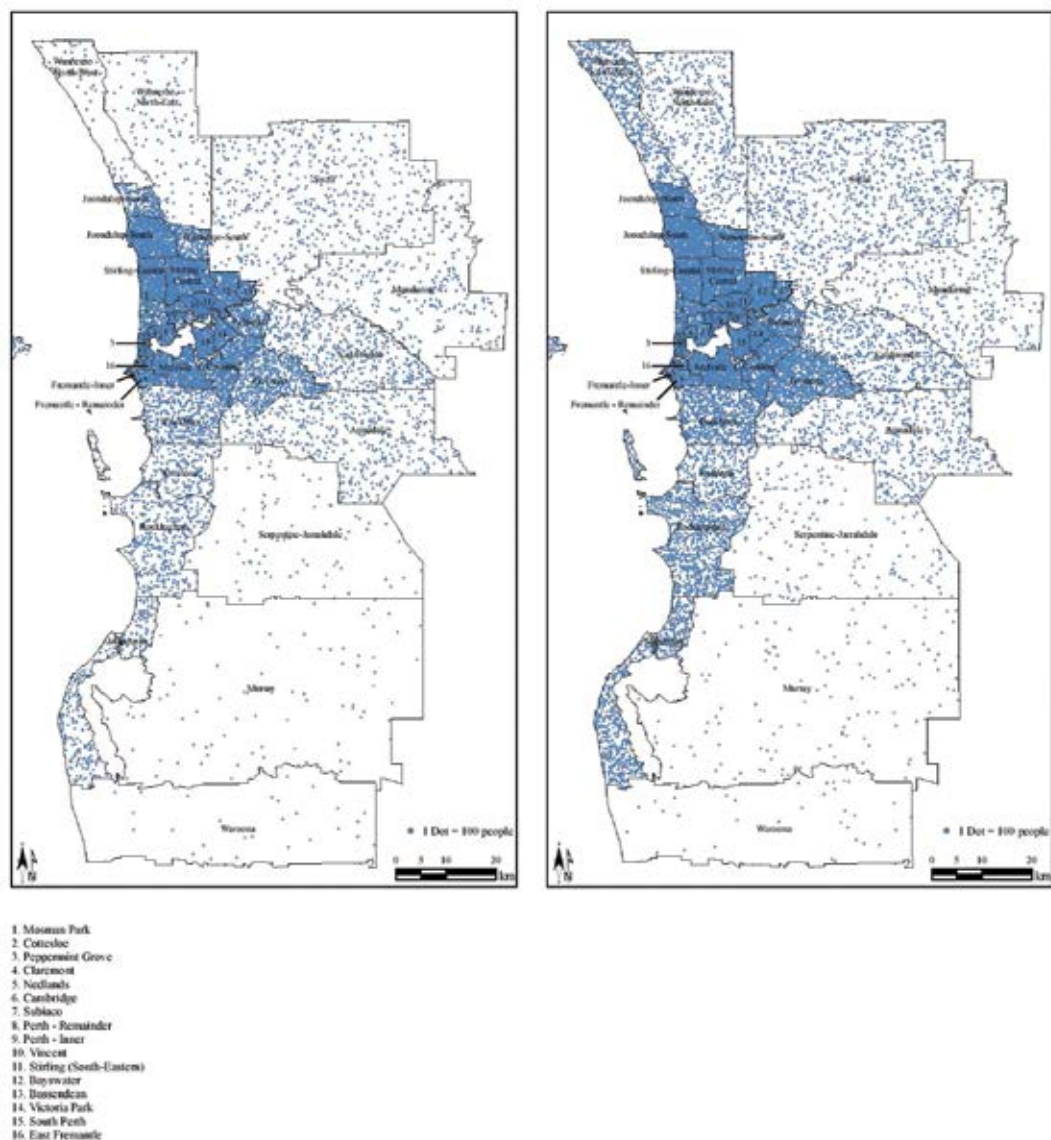
As outlined in Section 4, commute times and distances are also associated with the quality and structure of transport infrastructure. Recent Australian research has found that distance between home and work is less of an impediment to travel when the origin and destination are connected by direct freeway or rail links (BITRE, 2013).

As illustrated in Figure 5b, in Perth and Peel, the rapid rail links have overcome the 'tyranny of distance' with access to employment by public transport higher in some outer locations served by rail links than in some middle locations without direct access to a rapid rail service. This is most evident in northern and southern corridors.

These patterns of accessibility have influenced growth patterns and between 1991 to 2011, population densities in Perth and Peel increased in a primarily linear corridor pattern with population densities mainly increasing in outer northern and southern locations as shown in in Figure 5c (Huddleston, 2015).



Figure 5c: Population Densities for 40 Metropolitan Perth and Peel Statistical Local Areas, 1991 and 2011 (Source: Huddleston, 2015).



This growth pattern is not only driven by infrastructure. It is a combined outcome of climatic conditions which make coastal living desirable; topographical constraints; and land use and transport planning which has facilitated orderly low-density growth within the north-western and south-western urban corridors. Transformational infrastructure projects including the Kwinana Freeway, Forrest Highway and Perth to Mandurah railway to the south and Mitchell Freeway and Perth to Butler rail line to the north have supported this growth pattern.

Perth's linear growth form has increased total possible commute distances in Perth and Peel, that is, if people are commuting from outer southern to outer northern locations their commute distance could exceed 150km each way.

The region's linear urban form is also placing considerable pressure on infrastructure assets, including the Mitchell and Kwinana Freeways, which have been identified as being among the top 10 most congested roads in Australia (BITRE, 2015). Outward growth patterns also generate pressure for infrastructure investment to be focused on extending the transport system outwards (to service new fringe areas) rather than inward to deliver new infrastructure and services and improve capacity of the system in established areas that accommodate the majority of jobs and people and generate the bulk of public transport trips.

### 5.3 Traffic Congestion

Traffic congestion has a big impact on commuting and travel time and can significantly reduce the ability of residents to access employment and services within a reasonable travel time as well as the capacity for businesses to efficiently move people and goods.

Traffic congestion also influences mode choice in Perth and Peel because people are more likely to choose an alternative mode such as rail if their car commute is impacted by traffic congestion (see Sections 8 and 9). Traffic congestion has also been found to be the number one frustration of commuters in Perth and Peel and there is a perception among a majority of car commuters that congestion is getting worse (Ipsos, 2015).

Businesses in Perth and Peel are also impacted by traffic congestion and these impacts are most often reported by businesses that are dependent on road transport for moving people and goods; organisations reliant on the movement of large numbers of people (i.e. health and education institutions); and businesses in non-CBD locations (see Section 6).

Current evidence indicates that the costs of congestion in metropolitan Perth are lower than in other Australian capitals such as metropolitan Melbourne and Sydney. The 2016 TomTom Congestion Index rated Perth 72nd in its Global Traffic Index in regard to congestion delays in peak periods. Melbourne is rated 52nd and Sydney 30th. According to TomTom, congestion in Perth increases travel time by 44-45% compared to free-flowing conditions (TomTom, 2016).

In Sydney, traffic congestion has been identified as a direct impediment to economic growth and productivity in the Sydney CBD. It has also been identified as a key factor in encouraging an increased proportion of Sydney's working population to travel to work by public transport (Davis, 2016).

While congestion delays in Perth and Peel are not yet as significant as within other major Australian metropolitan regions, traffic congestion and congestion delays are projected to increase. It is predicted that without additional infrastructure investment, congestion costs in the region will rise very substantially from \$2 billion (2015) to \$5.7 billion, associated with increased time to move people and goods. It is also predicted that the Perth and Peel region may be home to seven of the ten most congested roads in Australia by 2030 (BITRE, 2013).

Increased congestion is likely to have significant negative impacts for people and businesses, particularly those that rely on the movement of people and goods by road and will increase the need for people to have access to alternative mode choices.

## 5.4 Jobs - Skills Match

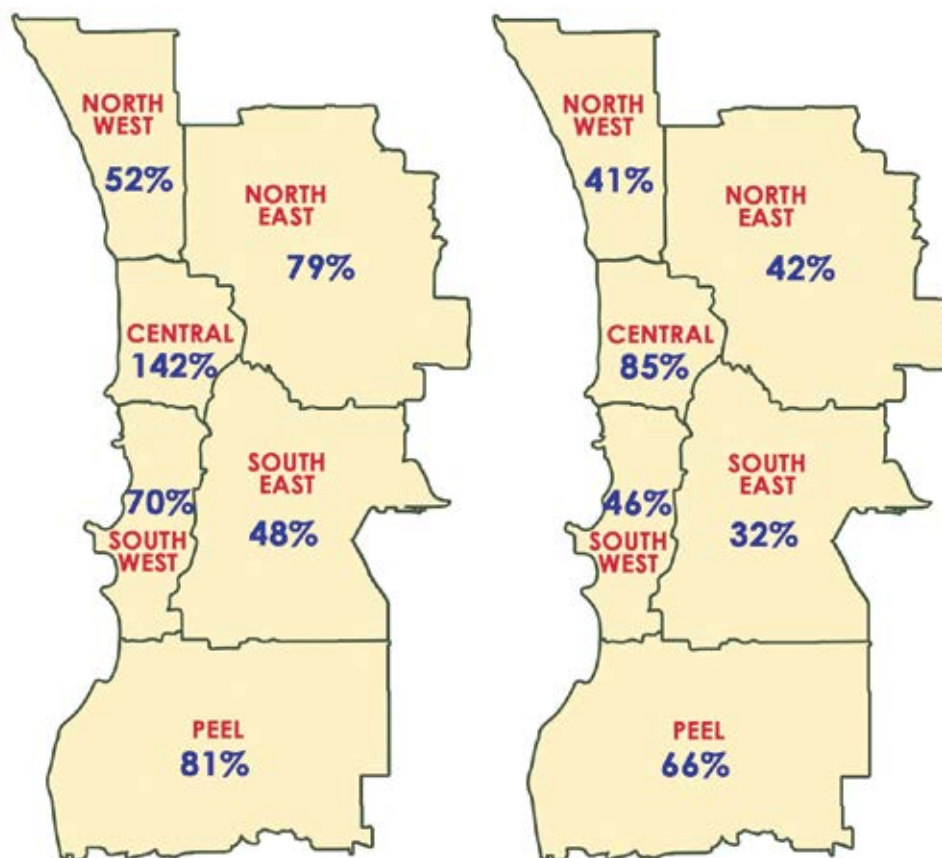
Research undertaken by Martinus and Biermann in FACTBase Bulletins 46 and 49 also established that the quality of jobs available in an area and their compatibility with the skills of job-seekers is central to employment decisions and the resultant directions, time and distances travelled by commuters.

Land use planning strategies for Perth and Peel have had long-term goals to increase the balance between housing and jobs in outer sub-regions (jobs-housing balance) in order to increase the potential for employment self-sufficiency (an even proportion of local workers to local jobs).

However, it is evident that the primary goal of employment decentralisation has been to increase the proportion of people who both work and live within the same sub-region, thereby reducing the need for long commutes. This is known as employment self-containment.

In FACTBase Bulletin 46, Martinus and Biermann (2016) examined job-housing parity and employment self-containment. This analysis found that while job-housing parity (the proportion of jobs to residents) has increased in most outer sub-regions over time, a majority of workers in outer sub-regions continue to travel out of their home sub-region to access employment, with the largest commuting flows being to the Central sub-region. As a result, jobs-housing parity and levels of self-containment within most sub-regions in Perth and Peel remain relatively low and the Peel region is the only sub-region, outside Central, with a relatively high level of self-containment (68%) as illustrated in Figure 5d.

**Figure 5d: Sub-Regional Job Parity and Employment Self-Containment in Perth and Peel (Source: Martinus, 2016).**



In FACTBase Bulletin 49, Martinus examined where workers live by occupation type. Across all types, the most populous Central sub-region was found to accommodate the highest number of workers.

**Table 5b: Sub-Region Job Skills Mismatch, Occupations minus Numbers of Working Residents in Those Occupations, Number of Workers, 2011**  
(Source: Martinus, 2016).

Sub-region	Managers	Professionals	Technicians and trades workers	Community and personal service workers	Clerical and administrative workers	Sales workers	Machinery operators and drivers	Labourers
Northwest	-10,058	-16,276	-17,786	-6,741	-15,824	-5,627	-5,481	-6,474
Northeast	-2,571	-4,926	-5,330	-3,156	-6,484	-2,290	-2,343	-2,575
Southeast	-4,042	-5,962	-10,321	-3,646	-9,533	-3,682	-6,514	-5,490
Southwest	-2,371	-5,290	-6,381	-3,546	-6,129	-2,628	-3,013	-3,490
Peel	-1,040	-812	-3,073	-638	-1,104	-384	-1,853	-1,502
Central	11,299	16,363	7,913	7,257	29,258	7,815	3,826	1,575

This shows that all types of workers travel for work, however 'white collar' workers (professionals, managers, and clerical administration workers) are more likely to travel to central locations. In contrast, sales workers are most likely to live and work in their own sub-region. It also indicates that people who live in Central and Northwestern sub-regions are more likely to have skills which match tertiary or 'white collar' industries.

The research also suggests that decisions about where to work are influenced more by the location of jobs that are compatible with the skills of the individual than by proximity alone. Martinus (2016) therefore concluded that if travel distances are to be decreased, increased '*attention should be given to job-skills matching across the entire metropolitan region in order to provide employment opportunities that match the skills of local residents*' and that '*this should be given a higher priority than focusing on the provision of absolute numbers of jobs in outer metropolitan sub-regions*' (p. 7).

## 5.5 Housing Preferences, Affordability and Diversity

Factors such as the housing and lifestyle preferences of individuals and housing affordability within the region also have a substantial impact on commuting.

The Western Australian Department of Planning's Housing We'd Choose study (2013) provides the most recent evidence regarding the housing preferences of people in Perth and Peel. The study found that most people in the Perth region state a preference to live in single residential houses, however a significant proportion would be willing to compromise and live in a semi-detached house or an apartment in order to live in their location of choice.

Currently the regional housing stock is heavily weighted towards single residential dwellings. Data from the Australian Bureau of Statistics indicates that 77% of dwellings in Greater Perth are single houses; 17.9% are medium-density dwellings (i.e. semi-detached dwellings, townhouses); and 4.8% are high-density (apartments and flats).

The study indicated that access to work, rather than proximity, for the primary income earner was identified as a very important consideration when choosing a home, second only to safety. Other major considerations identified were affordability, access to schools and public transport and being close to family and friends (Department of Planning, 2013).

Central and central western/southern locations (i.e. the Perth CBD west to Fremantle, including inner-southern locations along the Swan River) were most commonly identified as preferred locations to live in the Perth region, being preferred by 40% of respondents. These respondents were most

likely to state a willingness to compromise on house type in order to afford a home in these locations (Department of Planning, 2013).

The Housing We'd Choose study (2013) therefore identified a need for a substantial increase in the supply of semi-detached dwellings in inner locations, with some additional separate housing supply in coastal regions in order to *'deliver a much more diverse product and provide a far greater choice for Perth and Peel households, permitting location and house type/size trade-offs'* (p. 16). To achieve this, the study recommended that the proportion of separate houses is reduced in order to deliver *'a much more even spread of around 56 per cent separate houses, 35 per cent semi-detached and 9 per cent apartments'* (Department of Planning, 2013, p. 16).

Overall, this suggests that a significant proportion of people would prefer to live closer to work but are restricted in their choices by housing affordability and inadequate housing diversity in accessible inner locations.

It is also evident that the increase in two-worker households in Perth and Peel is making locational decisions more complex - and may have reduced the capacity for people to choose homes that are close to work. As outlined in Section 2, this issue has been observed in cities around the world.

Martinus et al. (2016) quote O'Connor and Healy (2004), stating: *'many of the home- and job-location decisions are being made by smaller, one person or two person-two income households, where one (or both) might be employed part-time, the majority are car drivers and the housing decision might be for rental rather than purchase. Hence, we are not dealing with the close one-to-one relationship between suburban jobs and suburban houses envisaged in earlier research'* (p. 30).

## Traffic congestion has a big impact on commuting and travel time

## 5.6 Summary of Key Findings

### Access to Employment

Employment in Perth and Peel is currently relatively accessible compared to Sydney and Melbourne.

Access to employment by car and by public transport is highest to and from central locations and lowest from outer residential locations. Access to employment from outer residential locations is likely to decrease if residential development continues to be focused on outer suburban areas, while employment remains centralised.

### Infrastructure Pattern and Quality

The hub-and-spoke form of transport infrastructure in Perth and Peel reinforces Perth's centralised employment structure.

The provision of north-south infrastructure links have improved accessibility in the northwestern and southwestern corridors but has also helped to facilitate a linear form of population growth which is increasing possible commute distances and delivering transportation and accessibility challenges.

### Linear Outward Growth Patterns

Outward linear growth patterns increase total possible commute distances and reduce the resilience of existing transport infrastructure, particularly north-south links.

Outward growth patterns generate pressure for infrastructure investment to be focused on extending the transport system outwards (to service new fringe areas) rather than inward to deliver new infrastructure and services and improve capacity of the system in established areas that accommodate the majority of jobs and people and generate the bulk of public transport trips.

### Traffic Congestion

Traffic congestion in Perth and Peel is a major frustration for commuters but overall is not yet as big as an impediment to travel as congestion in Sydney and Melbourne. However, traffic congestion is significant on north-south freeway routes and is predicted to increase in the future without significant additional infrastructure investment.

### Skills Match

White collar workers are more likely to travel to central locations for work because this is where office, professional and clerical employment is located. Managers, professionals and clerical administration workers are most likely to live in the Northwest and Central sub-regions.

There is a need to match employment opportunities with the skills of local residents.

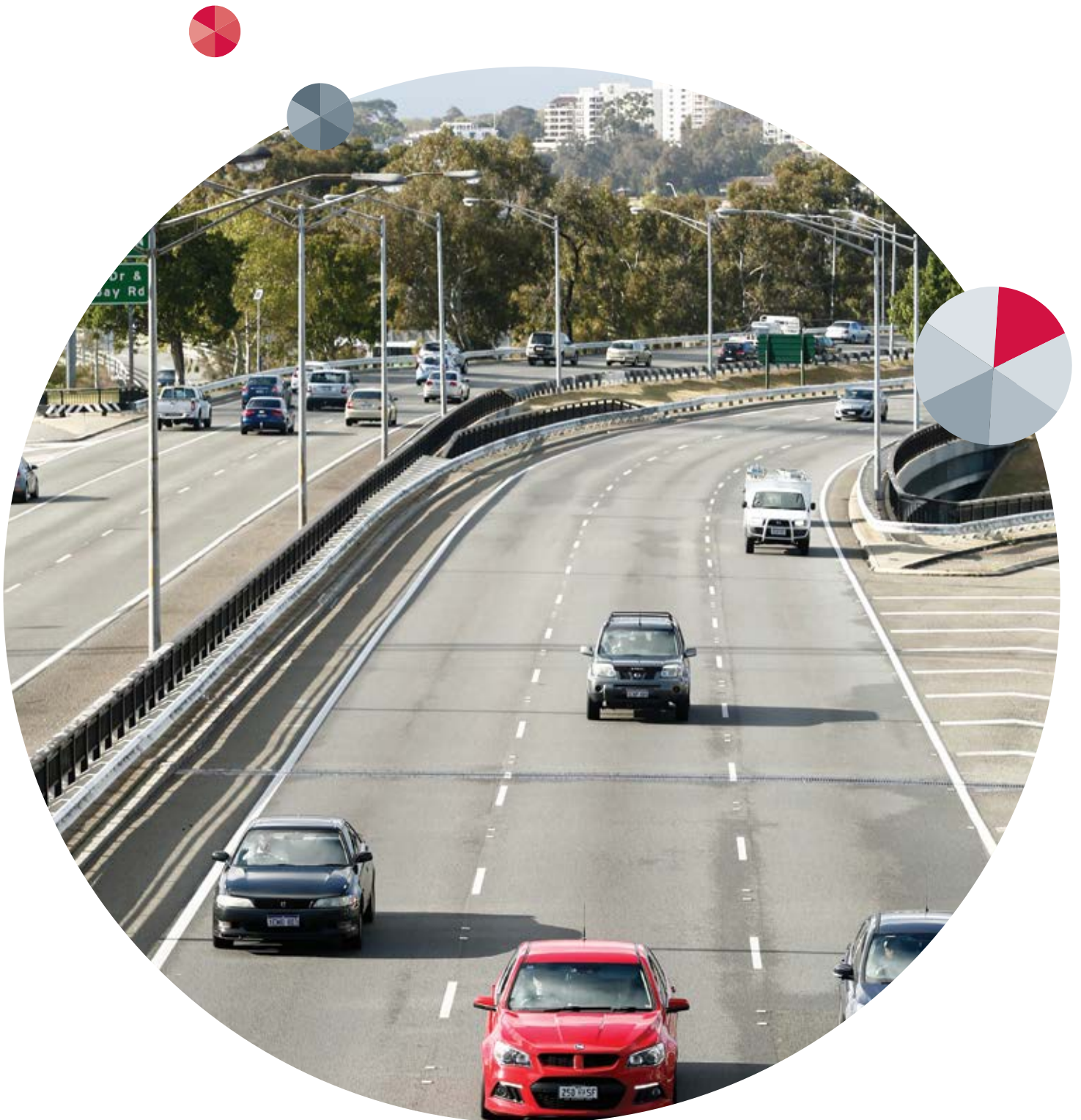
Central locations are most often identified as preferred areas to live but research indicates that there is inadequate housing diversity in these locations.

Two worker households mean that home and work choices have become more complex.

### Housing

There is a need for a substantial increase in the supply of semi-detached dwellings in inner suburban locations.







## Section 6: Understanding Business Location Decisions in Perth and Peel

Ms Georgia Harford-Mills and Ms Gemma Davis  
Committee for Perth and The University of Western Australia

In Perth and Peel, a majority of businesses are located in the CBD. An estimated 134,276 people are employed in the CBD and it generated \$40.7 billion of economic activity between 2011-12, substantially more than any other part of the region (Kelly & Donegan, 2014).

Despite decades of strategic planning strategies that have sought to decentralise economic activity and employment in the Perth metropolitan region, businesses with a professional workforce continue to locate in central areas.

This Section has been prepared by the Committee for Perth using feedback collected through the *Get a Move On!* Business Interviews. It seeks to explain why businesses locate where they do. It also examines the stated motivations of businesses who choose to locate in the CBD, inner city, inner suburbs and outer suburbs; identifies the impact of congestion on these businesses, if any; establishes whether businesses know and understand their employee mode choices, and whether any currently administered initiatives influence this decision; and seeks to understand the solutions that most businesses support in order to enhance Perth's future mobility.

### 6.1 *Get a Move On!* Business Interview – Sample

As part of *Get a Move On!*, the Committee for Perth sought to understand the motivations behind locational choices for business and the impact of congestion, if any, on businesses located in the CBD, centrally and in outer locations. 40 businesses were interviewed representing an estimated 100,000 commuters. The businesses interviewed represent various industry sectors including banking, construction and development, design, education, local and State Government, health, industry, insurance, leasing agents, media, not-for-profit, professional services, real estate, resources and transport.

A copy of the Business Interview question guide is provided at Appendix 3.



## 6.2 Locational Motivations

The *Get a Move On!* Business Interviews asked respondents to identify the motivations behind choosing to locate where they were, whether that was the CBD, centrally or in outer locations and the likelihood of relocation in both the short and long-term.

Businesses located in the CBD identified the following motivations behind their locational choices:

**Table 6a: Identified Benefits of a CBD Location and Potential Costs of Relocation (Source: *Get a Move On!* Business Interviews, 2016).**

Identified benefits of a CBD location	Identified costs of a non-CBD location
The prestige of the CBD is important to many, and provides businesses with a professional brand that helps to attract and retain staff	The north/south river divide (Swan River divide) creates resistance against locating elsewhere
Allows access to clients as well as peers and various industries	Public transport does not support suburb to suburb movement sufficiently
Accessibility is greatest in the CBD, allowing commute by car, public transport or active transport	Perth lacks an identified second city or hub which would be the next best option for many smaller businesses
The CBD contains high levels of amenity, offering a cultural experience not matched elsewhere in Perth, especially in light of so much recent development	Locating elsewhere has the potential to decrease the pool of skilled senior staff
The CBD offers sufficient space for businesses that have a large amount of employees	
Rent values in the CBD are currently competitive with alternative locations	

The types of business located in the CBD included resources, banking, financial and professional services, legal and government. A majority of these businesses reported that they would not consider moving out of this location, as the benefits of a central business district location outweigh the costs.

Businesses located in inner city locations such as West Perth, East Perth and Northbridge, identified various motivations behind their locational decision. Inner locations were seen to offer:

- Ease of **access to the CBD** without business having to pay the **price of CBD rents**, allowing proximity to large CBD **competitors**;
- Greater ability to **park** for both staff and clients;
- An atmosphere that was more **relaxed** with close proximity to **natural attractions** such as Kings Park;
- High quality **amenity**; and
- Less congested **freeway access** points.

The types of business located within the inner city included developers, health services, junior mining firms and business services. Most inner city businesses identified that they would not consider decentralisation, however some indicated that they would consider moving closer to the CBD.

**Inner suburban businesses**, located within 15 kilometres of the CBD, chose to be in these areas because the location offered:

- Greater **affordability** compared with the CBD and inner city areas;
- Sufficient space for premises to be **purpose built**;
- Opportunity to have a large local workforce due to the proximity of residential areas;
- A **non-central location**, where client access was not critical for business; and
- A **community**, inner suburban feel that could be matched through **business branding** or **culture**.

The types of business that were located within the inner suburbs specialised in technology, logistics, light industrial, property, architecture, education and health. Most inner suburban businesses identified that they would not consider further decentralisation, however some indicated a desire to move closer to the CBD.

Many inner suburban businesses also said that they chose the inner suburbs due to a lack of specific industry hub for their type of business, allowing for flexibility of location.

**Outer suburban businesses**, greater than 15 kilometres from the CBD, chose to locate in these areas because they could:

- Locate near a specific industry in an **industrial estate**;
- Create a **consolidated company** that located in one **large premises**;
- Buy or build a premises that was considerably **more affordable**;
- **Expand** their premises for future use if required;
- Ensure **access** to specific services where required, such as the **airport**;
- **Avoid congestion** on the inner suburban road network; and
- Provide **sufficient parking**.

The types of business located in these areas included freight, manufacturing, industrial, agriculture and government.

## 6.3 Business Impacts of Congestion

As part of the *Get a Move On!* Business Interviews, each company was asked to reflect on the impact of congestion, if any, on the business in terms of financial, productivity, cost or quality of life. They were also asked to identify whether the company employed specific strategies that dealt with congestion in some manner.

There was a strong divide in the business community in terms of the impacts of congestion.

### 6.3.1 *Some businesses do not perceive congestion to be a business issue*

Businesses that indicated congestion was not an issue were generally: located in the CBD; located within close proximity of a train station; and professional service firms. For these businesses, congestion was generally considered to be an individual or personal issue and was not something that the business would address through company policy.

Additionally, CBD based businesses were most likely to perceive congestion to be confined to specific hotspots in the region or associated with road works, special events or car parking access points.





CBD businesses interviewees commented:

*"Congestion is not something that affects our business. We adapt where we need to, but largely it isn't a consideration for us."*

*"I know it can be bad in Perth but it is made out to be much worse than it really is. I have experienced driving in other cities and know that we are doing OK comparatively. The problem here is that we are too reliant on cars."*

### 6.3.2 Some businesses are impacted by congestion

Businesses that identified congestion as an issue for their business were generally: suburban local governments with congestion hotspots; health and education institutions; and non-CBD businesses that rely on the road network for daily operations.

Many of these businesses have employed strategies or policies that specifically deal with congestion in some manner, which include:

- Ongoing measurement of congestion impacts through staff commuter surveys or digital trip monitoring;
- Investment in initiatives such as offsite parking, end of trip facilities and co-funding of additional transit services;
- Lobbying to increase car parking provision, public transport services, improved traffic signalling and mixed use accommodation at major employment destinations;
- Locating premises and depots in areas with optimal road network access;
- Operating and providing infrastructure in a manner that minimises impacts;
- Employment of technology to optimise routes and allow for remote connections through IT; and
- Behavioural change programs, such as early start times and facilitating commutes straight from home to site with company vehicles.

Of the businesses interviewed, the vast majority had not calculated the cost of congestion formally.

Businesses for whom congestion is a major issue commented:



*"In the last 10 years my commute time has increased dramatically. It takes me 30% longer to drive the same route to work."*

*"We have thousands upon thousands of people coming to us every day and we are not well served by public transport. We are incredibly focused on congestion. It is a critical area of risk we constantly try to manage."*



## 6.4 Employer Influence – Employee Transportation Choices

The Get a Move On! Business Interviews, also sought to understand whether businesses identified their employee methods of travel to work, and if this was influenced through incentivising certain modes of travel.

The responses indicated that very few businesses understood how their employees chose to commute, especially when considering mode choice. Some identified that it may be a measurement for future consideration, however it was seen to be a matter of interest rather than a business case for determination.

Some businesses already have initiatives in place that encourage their workers to use alternative modes of transport, however these were typically not administered for congestion reasons.



Many businesses supported car based commuting through various methods. This includes infrastructure provision such as parking; financial support through subsidising the cost of parking; administrative support through the ease of salary sacrificing techniques; and operational support through the allocation of company vehicles. A number of businesses also noted that there are perceived benefits of staff having cars at work, such as increased flexibility and ability to travel to meetings or run errands during office hours.

Businesses noted that driving was the predominant mode of transport used to get to work for senior staff and working parents, and was identified as the fastest method of journey to work. Some strategies employed by businesses to encourage sustainability included carpooling, car booking systems and Cabcharge cards.

Public transport use is supported by some businesses through initiatives such as locating close to transport infrastructure; lobbying for increased services; subsidised SmartRider cards, especially when relocating office locations; office SmartRider cards; promoting the Travelsmart program and educating staff about public transport; seeking discounted travel from the Public Transport Authority through promotion of SmartRiders; and provision of shuttle buses linking public transport and business where there are no viable alternatives.

Active transport also has the support of business and end of trip facilities are becoming an essential locational requirement to support active commuting and for worker hygiene. Businesses reported an awareness of an increase in cycling to work and perceived this to be due to health benefits as well as an increase in cycle paths. However, businesses were not aware whether end of trip facilities within their buildings were primarily used by active commuters or for other leisure activities.

Initiatives being undertaken by businesses to facilitate active commuting among employees include provision of increasingly comprehensive end of trip facilities; and replacing car bays with end of trip facilities.

## 6.5 Supported Congestion Solutions

The *Get a Move On!* Business Interviews asked respondents to indicate their level of support for various strategies that could be implemented that have the potential to reduce car dependence and subsequently congestion. Figure 6a below identifies the solutions discussed and the overall support or lack of for each strategy.

**Figure 6a: Business Support for Solutions Discussed (Source: *Get a Move On!* Business Interviews, 2016).**



### 6.5.1 Invest in public transport

When prompted, improving the public transport system through investment was identified by business as the most popular supported solution to congestion and was seen as critical to the future of Perth. Crucially, most businesses identified investment was needed before strategies such as incentives or disincentives which aim to facilitate behaviour change could be effectively implemented. This is because businesses do not perceive the existing public transport system in the region to be sophisticated enough or have the capacity to attract large numbers of additional users.

Businesses said:

*"There must be a viable alternative presented that is clearly a better mode of transport for commuters. Perth will never change while public transport is under performing."*

*"Be careful what we push for: current public transport infrastructure may not be able to support a major increase in commuter patronage without considerable upgrades. Therefore trying to relieve congestion by moving commuters to the current public transport system has limitations."*

*"Lay less roads –stop 'love affair with bitumen'."*

In regard to investment, businesses supported: increasing the capacity, frequency, system extensiveness and transfer links of the current system; facilitating movement through the CBD with initiatives such as light rail; creating links between suburban centres; and revisitation of the possibility of river transit.

Businesses also indicated strong support for bus. Buses are seen as a quick and flexible fix for many congestion issues, particularly in outer suburbs where feeder buses can link to transport hubs. It was felt there is an opportunity to use technology to track local journeys and develop bus journeys accordingly.

### 6.5.2 Technology

Improvement in, and greater uptake of, technology was also highly supported by business as a logical and nimble approach to congestion management.

Many businesses interviewed expressed an opinion that new technology provided the capacity for big data analytics that could assist in solving local congestion problems and increase the efficiency of the existing transport network. They said that while there is substantial expertise in this field within businesses in the region, it appears to be underutilised in the transport sector. Businesses also expressed an awareness of the potential for sensor technology to be applied to develop 'smart' or 'intelligent' traffic lights to better manage traffic and pedestrian movement. Other initiatives supported include variability in speed signs during different times of the day; bi-directional traffic lanes; and utilisation of real time information.

Businesses said:

*"Technology can play a big role in a city like Perth, which has wealth, expertise and the bones of a good transport system that just needs additional planning and effort to get right."*

### 6.5.3 Higher residential densities

Increasing the residential density of the Perth and Peel region was also highly supported by businesses and was seen as crucial in order to ensure Perth's future sustainability. To achieve this, businesses identified preference for a focus on increasing employment and residential densities within the CBD and inner 5 kilometre ring. Secondly, businesses supported increasing residential densities around public transport nodes to create true transit oriented developments.



Businesses said:

*"Increased density must happen for Perth to mature as a city, and for activity centres to function properly. This must happen around transport hubs to help change Perth's car culture."*

*"Rather than take jobs to the people, bring people to jobs."*



### 6.5.4 Business decentralisation

There were a number of strategies that received mixed support from businesses, and were generally subject to certain and specific circumstances.

Overall support for the decentralisation of professional service, science and technology sector jobs out of central locations to outer activity centres was low among the businesses interviewed. Organisations generally expressed a view that businesses will locate where they need to be and that decentralisation was more likely to be successful for industrial and non-professional service sector jobs.

CBD, inner suburban and centrally located businesses (i.e. within 15km of the CBD) are keenly aware of the business benefits of central locations and said that the pull of the CBD (from a cost, amenity and accessibility perspective) is currently stronger than ever. Businesses indicated that the CBD should be prioritised as a destination for employment and productivity, as there are significant benefits from economies of scale. Businesses also predicted a return to the CBD in the next few years while rent is low. Correspondingly, it was felt the outer CBD is ready for attention and may be where "decentralisation" should actually be happening. Businesses indicated that centralisation might be a better strategy in the short to medium-term as the CBD and surrounds are not yet at critical occupancy.

There was also a view that if decentralisation was to be effective it will rely on transport investment 'leading the charge'. There is also a view that success could be increased by creating branded business hubs and reducing the number of activity centres in the region to create a small number of defined, accessible nodes.



Businesses said:

*"The reason the city exists is the conglomeration of benefits, it is too expensive to be in outer areas. Big cities have big CBDs."*

*"The CBD is now a destination, not a place to work, so it is very attractive for business. The city can drive the culture of a business."*

*"If we weren't on St Georges Terrace we'd look second rate."*

*"The city is the only place for us to be. Our clients are here and so are our competitors. We rub shoulders and do business. It is the only way it works."*

*"Areas that may have lent themselves to further development (such as around Curtin) have poor public transport inhibiting success."*

*"Start with the CBD and 5km ring – Centralise business and make full use of the public transport network that exists and feeds into the CBD. Support this business with a local workforce by increasing density."*

*"There have been way too many hubs."*



### 6.5.5 Value capture

Value capture models were discussed with businesses as a potential solution, however businesses were of the view that these need further investigation and development in order to be a feasible proposition. Business noted that in order for value capture models to be successful they would require hypothecated raised funding and certainty about development timing and location.

Businesses interviewed said:



*"Developer contributor arrangements would be a battle for the Department of Planning. Having healthy relations with the private sector is critical."*

### 6.5.6 Low support solutions

Solutions that received low support from businesses included both cost disincentives to reduce car use and limiting the amount of car parking available. Businesses indicated that the car currently offered a significantly more attractive option as a commute mode, and those wedded to their car would not see it as a disincentive to change modes through significant cost increases. In addition, businesses believed that public transport did not currently offer a viable alternative, which would result in cost disincentives that impacted upon commuters who have no capacity for mode shift. When prompted, business identified tolls as being the most suitable cost disincentive for Perth.

Reduced car parking was another solution that had little support from business. This was largely identified as being punitive and raised concerns regarding the impact on commerce and local business due to limited customer parking availability. A number of businesses also identified that parking restrictions already caused conflict and raised complaints. Car sharing initiatives were identified by business as being a potential part of the solution, which offered workers vehicle access during the day when required.



Businesses said:

*"Perth does not have a sophisticated enough public transport system to penalise people for not using it."*

*"Use carrots not sticks."*



# The pull of the CBD is stronger than ever

## 6.6 Summary of Key Findings

### Understanding Business Location Decisions in Perth and Peel

Despite decades of strategies that have sought to decentralise economic activity and employment in the Perth metropolitan region, businesses with a professional workforce continue to exhibit a preference for central locations.

Central locations deliver benefits for businesses including prestige; amenity; accessibility; proximity to clients and peers; premises that suit a large number of employees; and competitive rents, in the current market.

The types of business located in the CBD included resources, banking, financial and professional services, legal and government. A majority of these businesses would not consider moving out of the CBD, as the benefits of a central business district location outweigh the costs.

The radial structure of the transport system; the 'Swan River divide'; the need to access a large pool of skilled labour; and the lack of a clear second city, limit the ability for professional service sector businesses to move out of the CBD.

Businesses choose inner city locations because of accessibility to the CBD; access to car parking; amenity; and less congested freeway access points.

The types of business located within the inner city included developers, health services, junior mining firms and business services. Most inner city businesses would not consider moving further out from central Perth however some would consider moving closer to the CBD.

Inner suburban locations, within 15km of the CBD, offer affordability; capacity for purpose built premises; opportunity for local workers; and capacity to establish strong branding or culture.

Inner suburban businesses tend to have less need for direct client access and include technology, logistics, light industrial, property, architecture, education and health. Most said they would not consider further decentralisation, however some would like to move closer to the CBD.

Outer suburban businesses, greater than 15km from the CBD, chose to locate in these areas because they are near a specific industry in an industrial estate; provide the capacity for large premises; are more affordable; enable expansion; provide access to specific infrastructure; avoid inner congestion; and provide on-site parking.

The types of business located in these areas included freight, manufacturing, industrial, agriculture and government.

Businesses that indicated congestion is not an issue were: located in the CBD; located within close proximity of a train station; and professional service firms.

Businesses for whom congestion is an issue are suburban local governments with congestion hotspots; health and education institutions; and non-CBD businesses that rely on the road network for daily operations.

Businesses for whom congestion is an issue have identified specific strategies to reduce the impacts of congestion on their business.

Very few businesses understand how their employees commute.

Business policies and the actions of business leaders most commonly support and model car commuting. This is because there are perceived to be benefits for the business of employees having their cars at work.

Businesses are most likely to support strategies associated with improving the efficiency of the transport network and infrastructure investment. Specifically businesses believe that investment in the public transport system is needed before strategies for behaviour change will be effective.

Technology is strongly supported as a nimble, cost effective solution to improve transport planning and the efficiency of the existing system.

High residential densities, particularly in inner areas and around public transport nodes are strongly supported by businesses.

Support for decentralising professional service, science and technology jobs from the CBD into outer activity centres is low.

Businesses believe that if non-CBD activity centres are to be successful, fewer hubs are needed and transport investment needs to 'lead the charge'.

Support for strategies that aim to shift behaviour through disincentives is low.







## Section 7: Public Transport Accessibility in Perth and Peel

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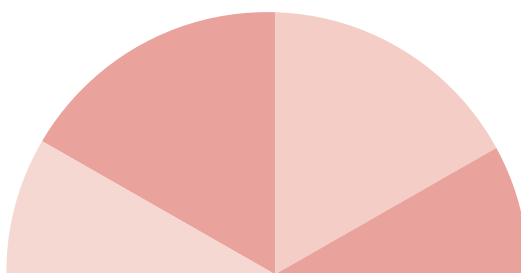
### 7.1 Introduction: Accessibility Planning, Public Transport Performance and Benchmarking

This Section has been prepared by Curtin University for the *Get a Move On!* project. The objective is to provide a benchmark on the performance of Perth's public transport system by employing a research, evidence-based understanding of the accessibility provided by the existing public transport network in Perth and also relative to other Australasian cities.

It compares Perth to Australasian cities in order to critically analyse the existing public transport system, and advise how the system might be expanded to alleviate traffic congestion as Perth continues to grow.

The Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) tool is used to investigate the performance of Perth's public transport system and eight SNAMUTS indicators are applied to evaluate the system.

A summary of Perth's performance against each of these indicators is provided in Table 7a. The analysis finds that Perth's public transport system has an excessive emphasis on servicing the central city area, driven largely by efficiency and cost-minimisation goals. While this assists in reducing peak-period congestion on Perth's freeway and highway network, improving the level of service provided by Perth's public transport system will require a shift to servicing a broader range of destinations.



**Table 7a: Summary of Perth's Performance - SNAMUTS Indicators.**

Indicator	Perth's Performance
<b>Service intensity</b> counts the number of trains and buses public authorities are prepared to provide in order to achieve a good public transport service.	Increased since opening of the Mandurah rail line but is relatively low on an Australasian and international scale.
<b>Closeness centrality</b> describes the ease with which users can move about the network, achieved by minimising travel times and maximising service frequencies.	High – the region's public transport network is easy to move around on an Australasian scale.
<b>Degree centrality</b> describes how much the network depends on making transfers between different vehicles.	The number of transfers needed for public transport trips is average on an Australasian scale.
<b>Network coverage</b> indicates the proportion of residents and jobs in the city that have a regular, full-time public transport service within walking distance of their homes or workplaces.	Low – less than half of residents and jobs have higher-frequency and full-time public transport within walking distance.
<b>Contour catchments</b> illustrate what proportion of the city can be reached within a public transport journey of 30 minutes or less (the average duration of a job commute).	The range of destinations accessible within travel time in Perth is similar to other second-tier Australasian cities, but low in international terms.
<b>Betweenness centrality</b> looks at how the network is organised: examining which places and routes are 'at the crossroads' of travel paths, and which ones are in quieter zones.	High – Perth scores comparatively well on an Australasian scale. The system is highly centralised however the region's low-density form depresses its betweenness centrality score.
<b>Network resilience</b> assesses whether the network, and individual routes, have potential spare capacity to attract more passengers, or whether they are vulnerable to congestion.	High – Perth's public transport network currently has the least resilience problems among the Australasian peers, due primarily to the pace of rail network expansion over the past 25 years. A continuing high rate of population growth, however, will erode this advantage in the future, unless further substantial investment is made.
<b>Nodal connectivity</b> assesses the strength of each activity node for integration of multi-modal public transport services, and by extension, the flexibility of users to move around the city on public transport.	Perth's average nodal connectivity is third lowest in the global SNAMUTS sample before Adelaide and Auckland. Only in the very centre of Perth does it appear reasonable for residents and businesses to rely primarily on public transport to travel around the city.

### 7.1.1 Methodology

The analysis provided in this Section has been prepared through:

- An investigation of the performance of metropolitan Perth's public transport system from a spatial accessibility perspective by making use of the Spatial Network Analysis for Multimodal Urban Transport Systems (SNAMUTS) tool.
- A comparison of Perth to the other large Australasian cities (Adelaide, Auckland, Brisbane, Melbourne and Sydney) and to three selected international cities. This allows for the positioning of Perth's public transport performance, identifying comparative strengths and weaknesses against each SNAMUTS indicator, and enables a discussion of policy opportunities and constraints.
- An analysis of post-2007 trends in public transport performance in Perth, highlighting the strengths and weaknesses of the current approach to integrated transport and land use planning in Perth.

By international standards, Australian cities are not well served by public transport, so referencing a selection of international cities including Vancouver, Helsinki, and Copenhagen, provides further analytical insight. This also enables an understanding of the key principles necessary in public transport network design if Perth is to improve accessibility by public transport. These cities were selected because they also have expansive low-density suburbs, yet they maintain high public transport accessibility alongside high levels of car use.

### 7.1.2 Background

Evidence shows that Australasian cities have long experienced rising traffic congestion and there have been ever increasing demands for large-scale infrastructure financing to build new roads and increase the existing roadway capacity (Low & Astle, 2009). Investment in public transport, however, offers a significant alternative to gain further market share from the car, thereby reducing traffic congestion and also addressing the social and environmental impacts associated with car dependence.

Strong growth rates in public transport usage during the past five years are setting a new trend (BITRE, 2013a). Australasia's public transport sector is facing a fundamental transformation, from its early start as a social welfare option for people who could not afford, or were unable to drive a car, towards a service for commuting to the central business district, and now towards a service capable of catering for all urban passenger transport needs across metropolitan areas (Mees, 2010). Public transport is now critical to people's sustainable mobility.

Since the mid-1990s, policy goals formulated by Federal and State Governments have begun to emphasise the desirability and importance of increasing public transport mode share (Department of Transport, Planning and Local Infrastructure, 2002; Department of Transport, 1995).

A National Charter for Land Use Transport Integration was adopted, identifying the need to integrate public transport systems directly with land use development (Transport and Infrastructure Council, 2003). The Commonwealth Government's infrastructure agency, formed in 2008, provided Federal funding contributions to State urban transport infrastructure that were conditional on the integration of strategic land use and transport planning, and initiated a reform agenda on major cities and infrastructure planning through the Council of Australian Governments (IA, 2009). In 2013, however, the incoming Federal Government terminated Federal action in urban public transport policy and funding, pointing to a significant partisan divide over transport policy in the political arena.

Public transport's role in influencing the land development investment and the functional patterns of cities is now well documented (Cao et al., 2009; Cervero & Dai, 2014). Areas with excellent public transport connectivity tend to attract residents who are most likely to utilise transit, increasing patronage (Cao et al., 2009). Long-term coordinated investment in structuring public transport networks to provide competitive access to a broad range of destinations creates a major opportunity to capture transport demand, transforming the mode share patterns in cities (Mees, 2000; Nielsen et al., 2005). The interplay between land use and public transport is multi-faceted, and improving the quality of public transport systems has several direct and indirect benefits beyond merely providing additional transport options for commuters in metropolitan regions.

Urban transport in Perth is a topic of ongoing public discourse. Unfortunately, political debates about public transport projects in Australia often lack reference to evidence or comparable interstate and international examples. This can result in arguments that do not match with the principles of how public transport can deliver genuine mobility to commuters, drive urban investment, create great places, and mitigate against the problems created by excessive car travel.

The Spatial Network Accessibility for Multimodal Urban Transport Systems (SNAMUTS) tool enables rigorous, methodical comparisons of public transport accessibility between cities. The lessons learned from these comparisons can inform improvements to urban transit in any city, including Perth. This maximises the benefits of infrastructure investments by maximising the degree to which projects improve individual sustainable mobility, addressing traffic congestion, reducing pollution, identifying development opportunities where high levels of accessibility by public transport can be achieved, and improving the sustainability of the transport systems.

### ***7.1.3 Benchmarking public transport***

In this paper, the SNAMUTS Accessibility tool is employed to benchmark public transport accessibility in Perth against other large Australasian cities and selected international cities. The benchmark is based on an objective where the public transport system provides residents a competitive, alternative choice to the car. This benchmark is based on public transport accessibility for all; other researchers and practitioners have chosen different metrics. For example, it is common for governments to use 'public transport patronage' as a measure that reflects the expectation that investment in the public transport network 'paid off'. Others focus on the cost of operating the public transport network, or the costs of construction. After Walker (2008), we assert that the choice of metric is dependent on the policy objective being considered. All too often the choice has been based on the cost of public transport framed around the storyline of 'public transport subsidy' (Curtis & Low, 2012) rather than based on the need to implement policy imperatives such as those identified above.

## **Urban transport in Perth is a topic of ongoing public discourse**



## 7.2 Accessibility Planning and Accessibility Tools

### 7.2.1 Introduction

Accessibility describes how well residents and employees are connected to jobs and other journey destinations. Accessibility analysis provides the means to bring land use planning and transport infrastructure planning together. These fields have often operated in separated 'silos'; accessibility analysis is an innovative and integrated approach that allows assessment of how well infrastructure plans align with the locations in a city where high levels of human activity take place or are planned. It allows assessment of how well land use plans for urban centres, neighbourhoods and growth areas function in terms of maximising the use of public transport for access to people moving about the city. Ultimately, maximising public transport accessibility throughout a metropolitan area is a critical goal of both sustainable transport and land use planning. Accessibility planning also demonstrates how the careful location of land uses can effectively address traffic congestion.

Applying the accessibility assessment approach is valuable in maximising the return on investment for transport infrastructures, ensuring the resulting services are as effective and efficient as possible. Accessibility planning enables an understanding of why Perth's existing urban system functions in the way it does and provides insights for how both the transport network and development locations could be improved to make public transport a viable alternative to car travel.

### 7.2.2 Measuring accessibility using SNAMUTS

The SNAMUTS tool focuses specifically on accessibility by public transport. Analysis has been completed for 25 developed cities on four continents to enable comparison and benchmarking of public transport accessibility measures for policy development (see [www.snamuts.com](http://www.snamuts.com)). The SNAMUTS tool measures accessibility at a minimum service standard<sup>2</sup> for the inter-peak period<sup>3</sup> set to be competitive with the car.

Accessibility performance is assessed from the perspective of the individual traveller, acknowledging that different users value different aspects of accessibility according to their specific movement and spatial needs. Public transport access points have a prominent role in the land use-transport system both from the perspective of public transport users, and of policymakers seeking to enhance the significance of the mode. Public transport access points can be seen as both transport nodes and urban places. Bertolini's (1999) 'node-place model' notes that while railway stations provide access to the transport network, which he defines as the 'node' element in his model, they also offer a 'place' function. So the railway station precinct can also be a destination where land use activities are available to public transport users and others. The place function, or accessibility of opportunity, is an important aspect of accessibility that must be considered as well as travel within a specific time range to and from each destination. As well as posing the opportunity for urban development, railway stations should also be desirable places to accommodate and welcome public transport passengers waiting for, transferring between, or alighting from transit services.

<sup>2</sup> SNAMUTS minimum standard requires bus and tram routes to operate at least every 20 minutes during the weekday inter-peak period, and every 30 minutes during the day on Saturdays and Sundays, to be included in the analysis. For rail and ferry routes, the minimum standard for inclusion is a 7-days-a-week service with 30-minute or better intervals during the weekday inter-peak period.

<sup>3</sup> In most public transport systems, the weekday peak hours is the period when service levels are optimised to facilitate specific trip purposes (work and school journeys). In contrast, the weekday inter-peak period (approximately between 10.00 and 15.00) offers the greatest diversity of travel purposes and so determines the potential of public transport to offer a viable alternative to the 'go anywhere, anytime' convenience of the car so allowing residents and businesses to meet their travel needs.

SNAMUTS contains a set of measurements of the public transport network, service development and land use activity and these in turn feature as SNAMUTS key indicators, which each evaluate different aspects of the system:

- **Service intensity** counts the number of trains and buses public authorities are prepared to provide in order to achieve a good public transport service;
- **Closeness centrality** describes the ease with which users can move about the network, achieved by minimising travel times and maximising service frequencies;
- **Degree centrality** describes how much the network depends on making transfers between different vehicles;
- **Network coverage** indicates the proportion of residents and jobs in the city that have a regular, full-time public transport service within walking distance of their homes or workplaces;
- **Contour catchments** illustrate what proportion of the city can be reached within a public transport journey of 30 minutes or less (the average duration of a job commute);
- **Betweenness centrality** looks at how the network is organised: examining which places and routes are 'at the crossroads' of travel paths, and which ones are in quieter zones;
- **Network resilience** assesses whether the network, and individual routes, have potential spare capacity to attract more passengers, or whether they are vulnerable to congestion; and
- **Nodal connectivity** assesses how flexibly users can move between different parts of the network, and which places in the city are most convenient to access by public transport.

### 7.3 Benchmarking Perth's Public Transport System

Perth's history of post-war suburban development planned for the region to be served largely by the private car and large highway systems, has substantially altered the function of the public transport system. Perth's radial train system, originally developed during the 19th and early 20th century, saw little expansion until the early 1990s. These so called 'heritage lines' have frequent stops, and encouraged the formation of small, mixed-used local town centres. Bus services mostly served as radial feeders, connecting suburbs with the CBD, or to key train stations. The construction of the Joondalup and Mandurah lines during the 1990s and 2000s respectively prompted the reorientation of bus services as direct feeders to stations along those lines, which are mostly situated within large freeway interchanges. While these services can generally meet the transport needs of some city workers, the system is poorly equipped to accommodate other travel patterns. SNAMUTS illustrates these deficiencies, and provides evidence of past and future trends for network and development investment.





In this Section, the analysis of the current public transport system for the different cities is based primarily on data collected between 2011 and 2014 comprising public transport timetables in the public domain and population and employment data.

For Perth, the analysis also includes an assessment, based on past accessibility, drawing on earlier data from 2007 and an analysis for 2016 for the public transport components, but not the population and employment data since this is dependent on release of the 2016 Census data.

### 7.3.1 Service intensity

The SNAMUTS **Service Intensity** index counts the number of vehicles for each mode that are in simultaneous passenger service during the weekday inter-peak period per 100,000 inhabitants. This measures the operational input required to provide the minimum service standard. The index also expresses the efficiency of public transport operation – low travel speeds or circuitous routes can inflate the results. High service intensity scores are therefore not necessarily indicative of better service, but rather are indicative of the level of resources that agencies are prepared to allocate to operation.

The level of investment in operating services on Perth's network is quite low. However, Perth's sprawling suburban expanse makes building and operating lines expensive. Perth's multi-modal network is organised hierarchically. Buses act as feeders and distributors to commuter railways and service secondary inner suburban corridors; this maximises resource use effectively, partially compensating for the low level of investment. However, significant spatial gaps remain between corridors of good public transport service. High train speeds on the Joondalup and Mandurah lines, designed to compete with the car, results in a lower number of trains required to operate them at a reasonable frequency compared to the older suburban railway lines.

Perth's rail network is operated at minimum 15-minute service frequencies seven days a week during the inter-peak period. This standard represents the best consistent service level found in any Australasian urban rail system, though in global terms it is relatively modest. The service intensity for Vancouver, Copenhagen and particularly Helsinki demonstrate the accessibility benefits achieved in those cities that are absent from their Australasian counterparts.

Service intensity levels in Perth have grown: from 9.8 vehicles per 100,000 inhabitants in the Perth and Peel metropolitan region in 2007, prior to opening of the Mandurah line, to 12.6 in 2011 and to approximately 15 in 2016. The extent of the public transport network has thus grown significantly faster than the population over the past decade, and also slightly faster than public transport patronage per capita. This is mostly due to frequency improvements on numerous inner urban and suburban feeder bus routes, including the gradual introduction of the 900-series routes with higher frequencies and longer operational spans.

### 7.3.2 Closeness centrality

This indicator quantifies the spatial separation, or travel impediment, users experience as they move about the system. It is composed of the travel time and the frequency of the service. Closeness centrality is shown as an average value across the network, and as an average for each activity node. Lower values indicate better performance or greater *ease of movement*. Good area-wide ease of movement is often achieved in lattice or web-shaped networks with many transfer points; conversely, in tree-shaped networks closeness values deteriorate rapidly from centre to periphery.

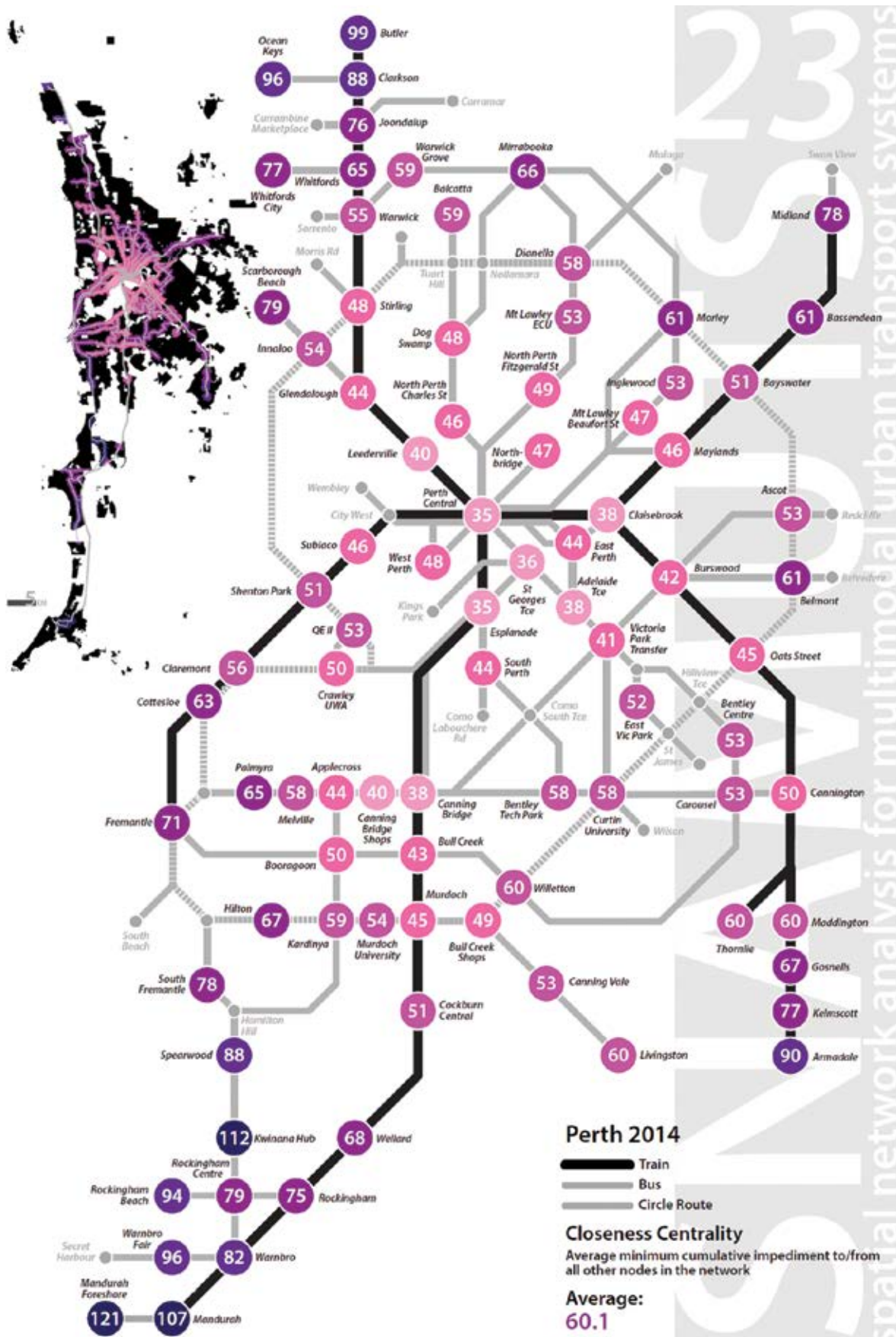
Among Australasian public transport networks, Perth's is relatively easy to move around in. This is due to the high speed and consistent 15-minute inter-peak and weekend daytime frequency of the train system, and the good integration between trains and buses. The key weakness is the relative lack of compact clusters of intense urban activity outside the centre of Perth. This leads to long journey distances that discourage discretionary public transport trips.

The network form is characterised by five radial rail lines interspersed by secondary radial bus corridors. The radial routes intersect in the middle suburbs with an orbital bus line (Circle Route 998/999). Rail stations usually have dedicated transfer facilities built to a high standard. A 'spider web' structure results, with a cluster of the lowest (best) closeness values in the CBD and then a wave-like spread of medium closeness values at the nodes along the Circle Route, better at intersections with rail lines and worse at intersections with bus lines.





Figure 7a: Closeness Centrality Perth 2014.





The spacing and speed of the rail lines result in cross-suburban journeys from one rail corridor to another generally taking longer by the Circle Route than by a rail transfer trip through central Perth, but of less duration than by a transfer trip using radial bus lines. Outside the Circle Route, the network forms a tree-shape with outer suburban radial rail lines connecting to short bus feeders, with few orbital links between these corridors. In such conditions, closeness values increase quite rapidly with distance from the central city.

Closeness centrality values have fluctuated: first with the addition of the Mandurah line; later due to changes in the frequencies of rail and bus services. When the Mandurah Line opened in 2007, Perth's overall closeness centrality score improved, from 58.5 to 55.8. In 2009, daytime train frequencies on the north-south train line between Whitfords and Cockburn Central were cut, from a train every 7.5 minutes to one every 15 minutes resulting in the score deteriorating to 60.3. Since then, the measure has fluctuated between 59.3 (2011) and 60.9 (2016) with adjustments in bus routes and frequencies. In some cases, timetabled travel speeds along bus routes have been reduced to account for growing traffic congestions. This has had a negative effect on closeness centrality scores, and has reduced convenience for bus users.

The public transport networks in Vancouver and the Scandinavian cities achieve a much better ease-of-movement standard than Perth through higher service frequencies and greater urban compactness. They also have a denser route network that allows users to move in a greater number of directions. Lattice or spider web-shaped elements dominate a larger proportion of the network, making it easy for users to reach their destinations without excessive geographical detours. Service frequencies also tend to be higher on average than in Perth.



### 7.3.3 Degree centrality

This indicator measures the number of transfers users have to make on a public transport journey. Degree centrality is shown as an average value across the network and as an average for each activity node. Lower values indicate a system with lower reliance on transfers. In a network with high service frequencies, a high number of transfer points can be seen as beneficial to flexibility of movement for travellers. Conversely where frequency of service is low, this translates to higher overall travel times where transfers are involved, and where there are few transfer possibilities a reduction in flexibility of movement.

The indicator reveals hierarchical patterns in the network structure, including the roles allocated to different public transport modes, as well as the opportunities for multi-directional movement. The transfer intensity of Perth's public transport network is average among Australasian cities. Long train lines from one end of the city to the other and the Circle Route bus reduce the need for transfers, while the configuration of many bus lines as feeders to train stations increases it.

Perth's average performance on this index is similar to Sydney's but poorer than in Brisbane, Melbourne and Auckland. With few exceptions, the network has been designed to deliberately avoid operating parallel rail and bus lines along the same corridors, opting instead for a trunk-and-feeder system with clearly differentiated tasks between rail and bus. This configuration has the effect of driving up transfer values and generates a group of nodes with values significantly above the average - Warwick Grove, Scarborough Beach, Livingston, and Rockingham Beach. However, the integration of the rail network with the Circle Route and other orbital bus connections, as well as the practice of operating a transfer-free rail service from one edge of the metropolitan area to the other, Butler to Mandurah and Fremantle to Midland, assists in reducing these numbers.

Before the opening of the Mandurah rail line, average degree centrality was at a level of 1.10 transfers per journey. From 2008 and 2016, it has fluctuated between 1.02 and 1.04. The Mandurah rail line, despite converting some previous radial bus routes into rail feeders that created new transfer needs, had a net effect of reducing the transfer dependency of Perth's public transport network. This is primarily due to the introduction of through services between Butler and Mandurah reducing the need for some city centre transfers, and the linking of train stations to both CBD bus terminals, creating easy connections between radial bus and train services.

The Copenhagen and Helsinki networks reduce transfer needs further by linking bus and tram lines to a greater number of train stations and activity centres than Perth. Vancouver's network increases transfer needs by following the rectangular street grid more rigidly.

**Perth 2014**

- Train
- Bus
- Circle Route

**Degree Centrality**  
Average minimum number of transfers to/from all other nodes in the network

**Average:**  
1.02



### 7.3.4 Network coverage

This indicator illustrates who receives walkable access to public transport and who does not. Walkable catchments around stations and stops are superimposed on a land use map, and the number of residents and jobs contained within are counted. The proportion of this figure of the metropolitan total provides the network coverage indicator. It can be read as a proxy for the inclination of decision makers to supply public transport services of a certain standard to as large a pool of potential users as reasonably possible.

Perth's Level of Service<sup>4</sup> by public transport accessibility is poor compared to other Australasian cities. Perth only provides higher-frequency and full-time public transport within walking distance to less than half its residents and jobs. Perth falls below Adelaide, Melbourne and Sydney, but outperforms Brisbane and Auckland, in terms of the percentage of metropolitan residents and jobs that are situated within walking distance from public transport stations or stops serviced at the minimum standard. This can be seen in the context of lower service intensity figures. In Sydney and Melbourne, the edge over Perth on this indicator is of a similar margin as for the network coverage indicator, though recent improvements to the bus network in Perth have begun to narrow the gap. Perth's lower rail station density than Melbourne's and Adelaide's, most of whose rail lines originate from the late nineteenth and early twentieth centuries and have much closer station spacing than Perth's more recent north-south line, also plays a role in limiting network coverage.

Vancouver, Helsinki and Copenhagen have a higher level of service by providing comparatively more resources into public transport operation, and by orienting more urban development around public transport nodes.

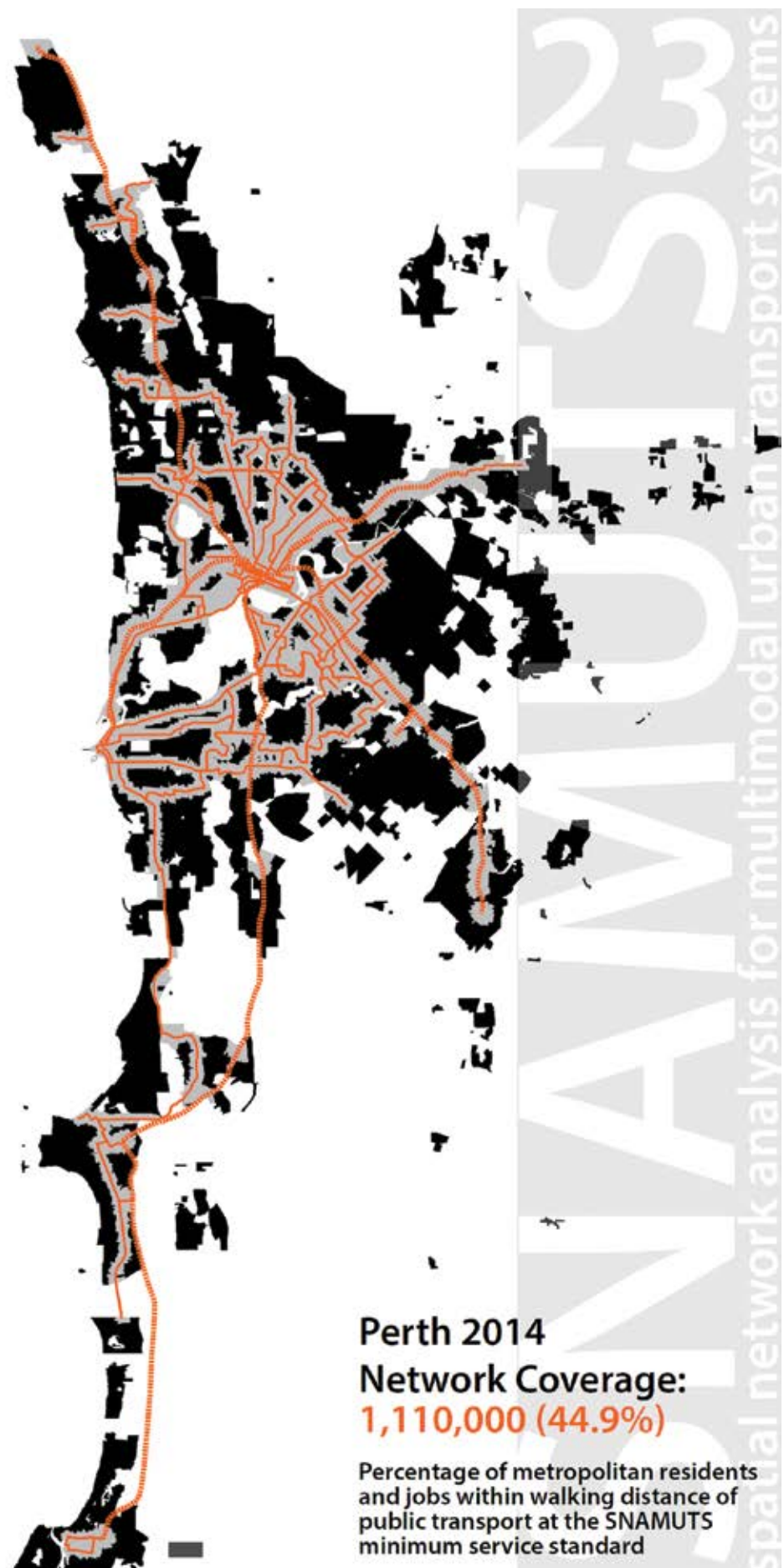
The opening of the Mandurah rail line increased network coverage modestly (from 36.7% to 39.9% of all residents and jobs); this is primarily associated to the location of the new stations either in the median of a freeway or in newly developing areas, without major pre-existing concentrations of land uses in the walkable station catchments. As the web of bus routes became denser during the following years, network coverage improved (to 41.4% in 2011) and further to an estimated 46.5% in 2016<sup>5</sup>.

<sup>4</sup> Measured by SNAMUTS network coverage.

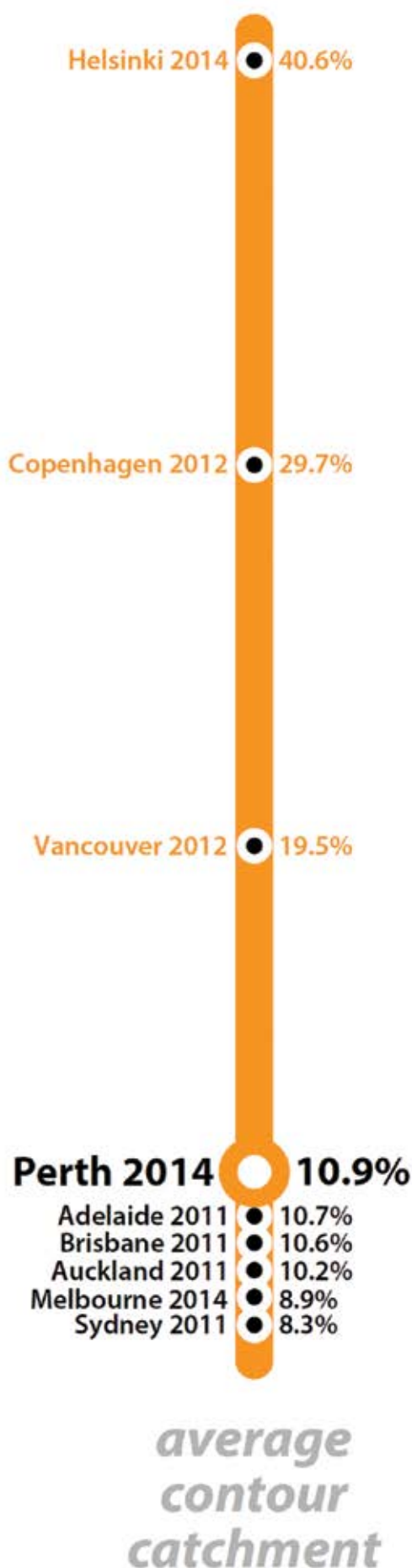
<sup>5</sup> Exact figures will only be available with the release of 2016 census data.



Figure 7c: Network Coverage Perth 2014.







### 7.3.5 Contour catchments

The 30-minute contour catchment indicator counts the residents and jobs within all defined activity node catchments than can be reached from the reference point by kerb-to-kerb public transport journey of 30 minutes or less (a travel time contour around each activity node). The range of destinations accessible within travel time in Perth is similar to other second-tier Australasian cities, but low in international terms. This measure should be expected to fall with growing city size, giving Perth an edge over Adelaide, perhaps related to the greater speed on its train system. Larger Brisbane, however, draws almost even with Perth, suggesting that urban intensification in public transport-accessible locations in Perth has not yet occurred at the scale found in Brisbane.

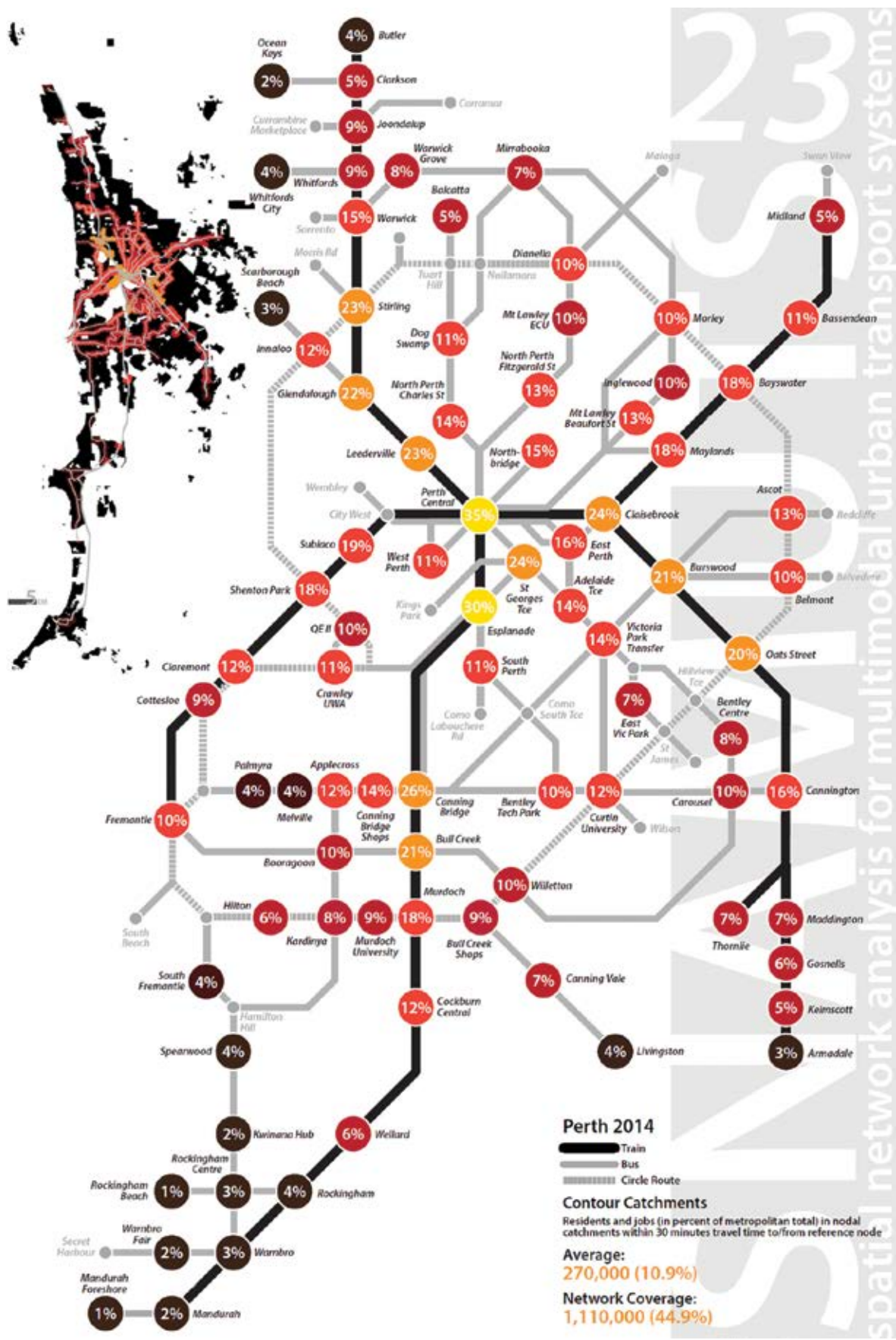
On this indicator, activity nodes along fast modes (rail system, freeway bus routes) are at an advantage; indeed the Canning Bridge interchange has the third largest contour catchment network-wide. Conversely, the index drops off quite rapidly with growing distance from the CBD for all other radial bus corridors. In the middle suburbs, the figures for Stirling and to a smaller extent Shenton Park and Murdoch, show the effect of the Circle Route to expand travel contours by adding orbital directionality to the network. The network's single 'super-node' at Perth Central captures more than three-quarters of the minimum-standard public transport network within a half-hour journey, representing, alongside Adelaide Central, the highest value across Australasia and illustrating the importance of the fast rail system in supporting this dispersed metropolis.

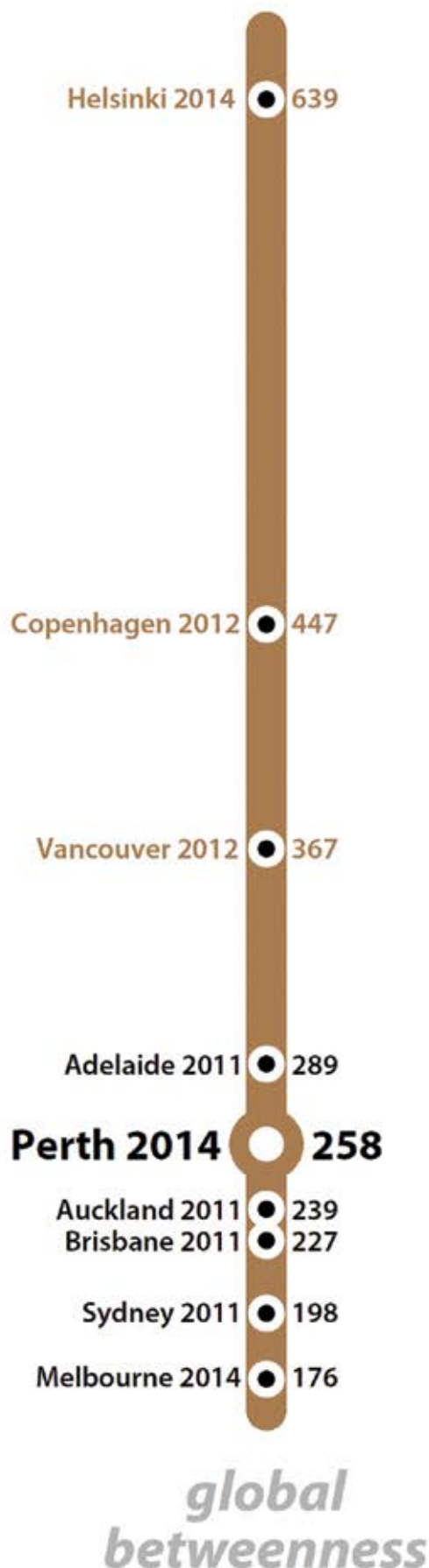
These contour catchment figures highlight the immense potential for Perth to become a more public transport-oriented city by the intensification of secondary city centres. Public transport connectivity, particularly the closeness centrality of new nodes, will be central to the success of such activity centre land use strategies.

The network reforms after the opening of the Mandurah rail line increased the average contour catchment from 10.0% of all residents and jobs in 2007 to 11.4% in 2008; however, it dropped in 2009 as rail service frequencies were reduced, and accordingly, average transfer times lengthened, and has since fluctuated between 10.6% and an estimated 11.0% in 2016.

Vancouver, Helsinki and Copenhagen achieve much greater average contour catchment scores through a combination of greater urban compactness, more development around fast rail lines, higher service frequencies and a denser route network that allows users to avoid time-consuming detours.

Figure 7d: Contour Catchments Perth 2014.





### 7.3.6 Betweenness centrality

This indicator visualises the *potential* for public transport to cater for urban movement. It shows where such 'movement energy' is concentrated and thus, to what extent an activity node or a transport corridor is located 'at the crossroads' of public transport supply.

Perth's public transport network is highly centralised: it primarily services the CBD area and channels many suburb-to-suburb journeys through the central city. In recent years, this constraint has been relieved marginally by service improvements to many suburban bus lines, making non-CBD journeys more attractive. Perth relies more on the rail system than other second-tier Australasian cities to facilitate public transport movement. However, since the Mandurah rail line opened, rail services have improved only marginally and buses have grown in relative importance.

In Perth, like in Sydney and Brisbane, the network stretches over a vast, dispersed area compared to the number of inhabitants. As a result, the global betweenness indicator is more depressed than if the city were more compact. However, relative to population and jobs it represents the second highest result among the Australasian cities, outperformed only by Adelaide, which has a vastly superior input of services. This illustrates the impact of the 15-minute rail frequencies and the high rail speeds on the generation of travel opportunities, compared to the 30-minute standard and slower services prevailing elsewhere. Perth appears to be more successful in channelling travel opportunities along the high-performance rail system, manifesting in a rail share of the total betweenness score inferior only to much larger Sydney and Melbourne among its regional peers. Partly in consequence, however, the CBD share of the orientation of the rail network and the scarcity of orbital links. In the Canadian and Scandinavian comparison cities, this constraint has been addressed by a network design that allows for far more convenient non-CBD journeys on public transport. This approach also drives up the global betweenness score in those cities.

Global betweenness in Perth rose from a level of 246 per million activities in 2007 to 259 million in 2008 as a consequence of the Perth to Mandurah rail line opening; however, it dropped again to below the previous level in the following year, following the reduction in daytime service frequency on the north-south trunk line.

By 2016, global betweenness is estimated to have recovered roughly to the 2008 level thanks to the frequency improvements across the expanding bus network. Simultaneously, the Perth to Mandurah line shifted travel opportunities towards the rail network, from a share of 41.2% in 2007 to 51.7% in 2008. After the 2009 rail service cuts and subsequent bus improvements, this ratio shifted again in favour of buses, which captured 53.5% of travel opportunities in 2011 and an estimated 56% in 2016. The growth of the network and the improved accessibility of more non-CBD destinations has resulted in a decentralisation effect: while the CBD channelled 44.5% of travel opportunities prior to the Perth to Mandurah line in 2007 and only marginally less (43.0%) after its opening in 2008, this share dropped to 40.0% by 2011 and likely further to below 39% by 2016.

Vancouver, Copenhagen and Helsinki do not depend on their CBD interchanges as much as Perth to facilitate public transport journeys. They have stronger and more attractive orbital links and a network structure in the inner and middle suburbs that allows users to largely follow geographical desire lines between origin and destination.

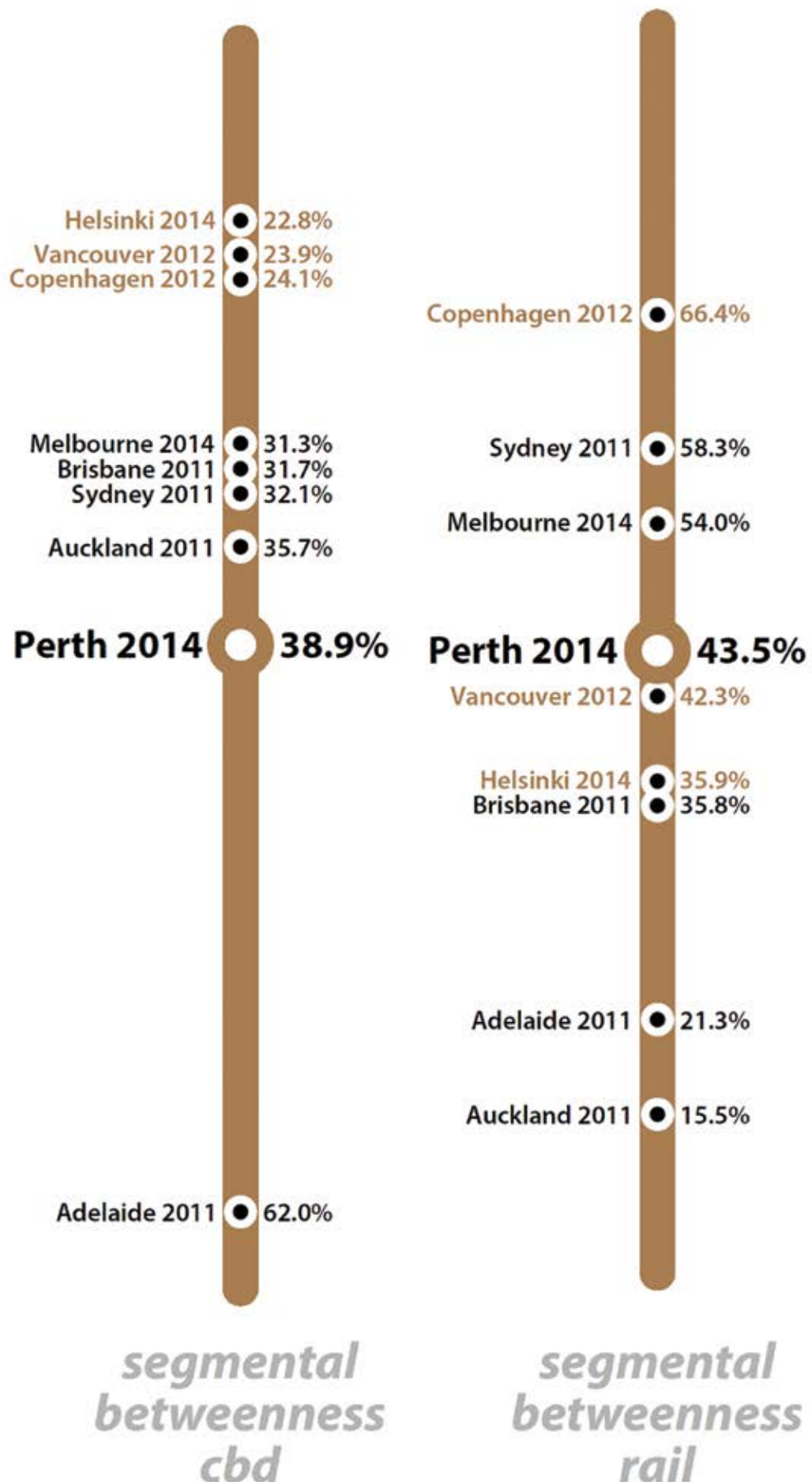
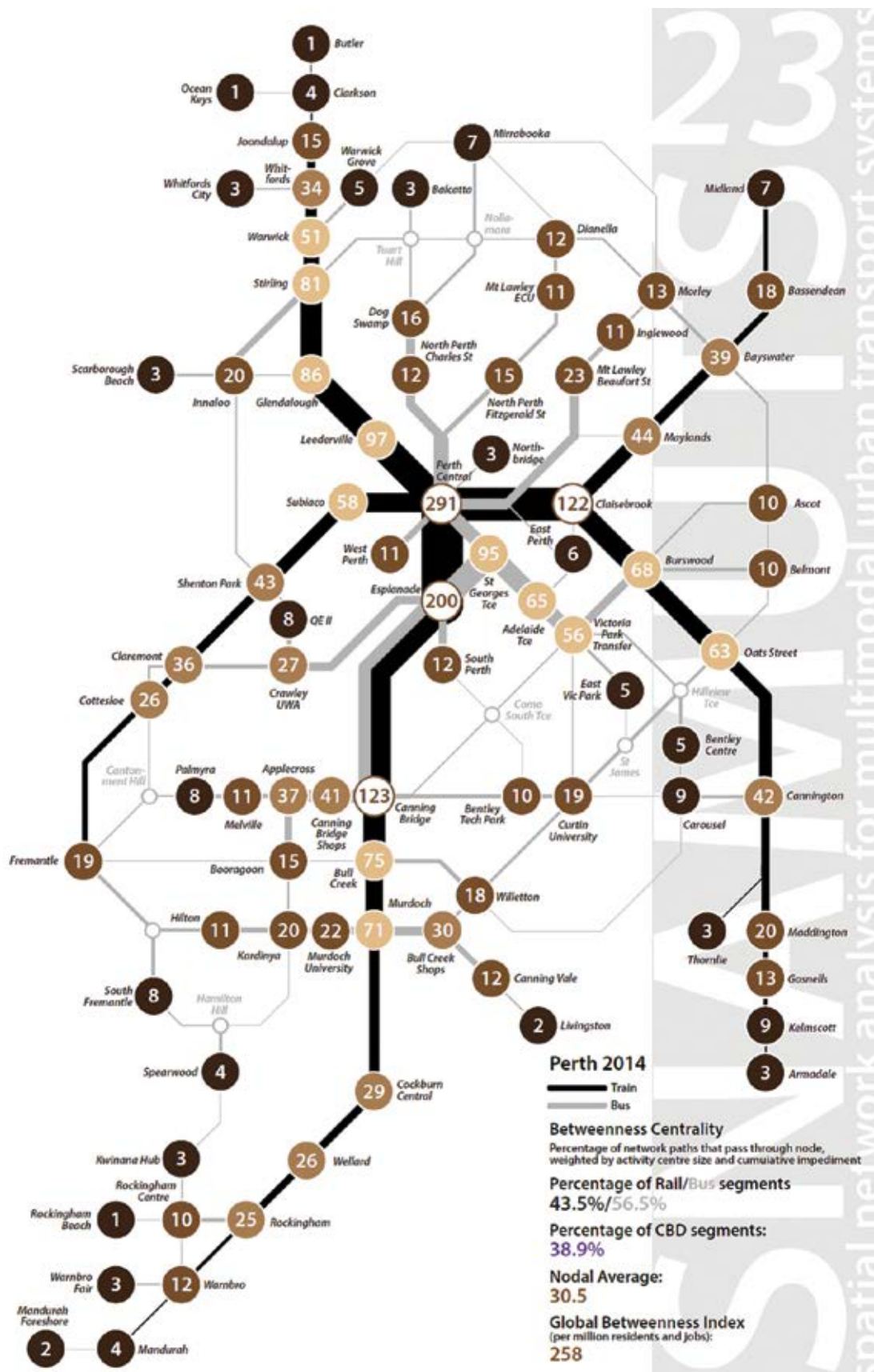




Figure 7e: Betweenness Centrality Perth 2014.





### 7.3.7 Network resilience

The resilience indicator provides a comparison between the significance of a route segment for the land use-transport system (betweenness) and the level of service provided (capacity).

Perth's public transport network currently has the least resilience problems among the Australasian peers, due primarily to the pace of rail network expansion over the past 25 years. A continuing high rate of population growth, however, will erode this advantage in the future, unless further substantial investment is made to increase the capacity of public transport in both established and newly urbanised areas.

Perth has the best average segmental resilience results among the Australasian cities, indicating that the distribution of transport tasks to rail and bus along a hierarchical model offers a more robust network able to accommodate further growth. However, the network resilience indicator also suggests several problems.

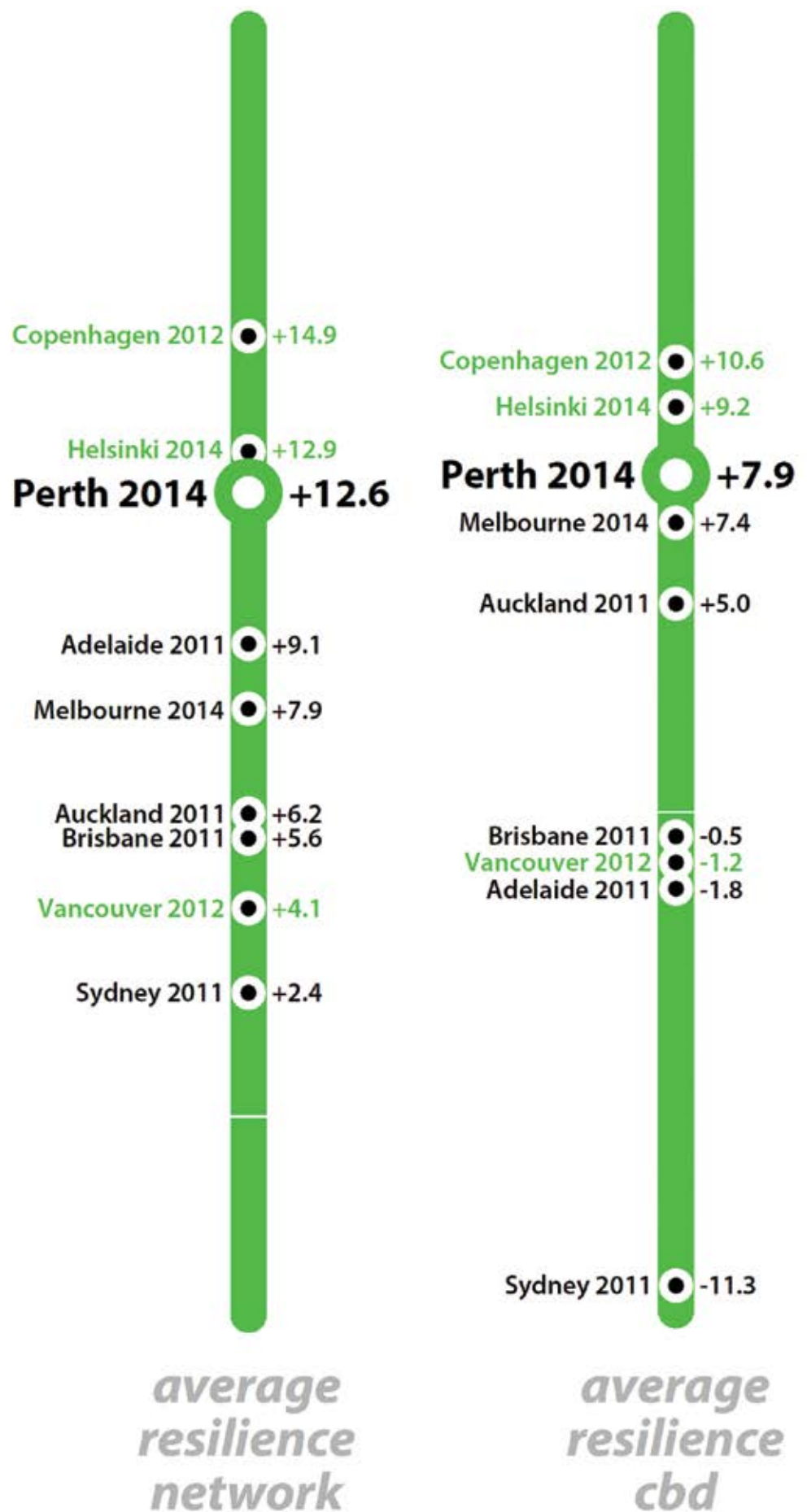
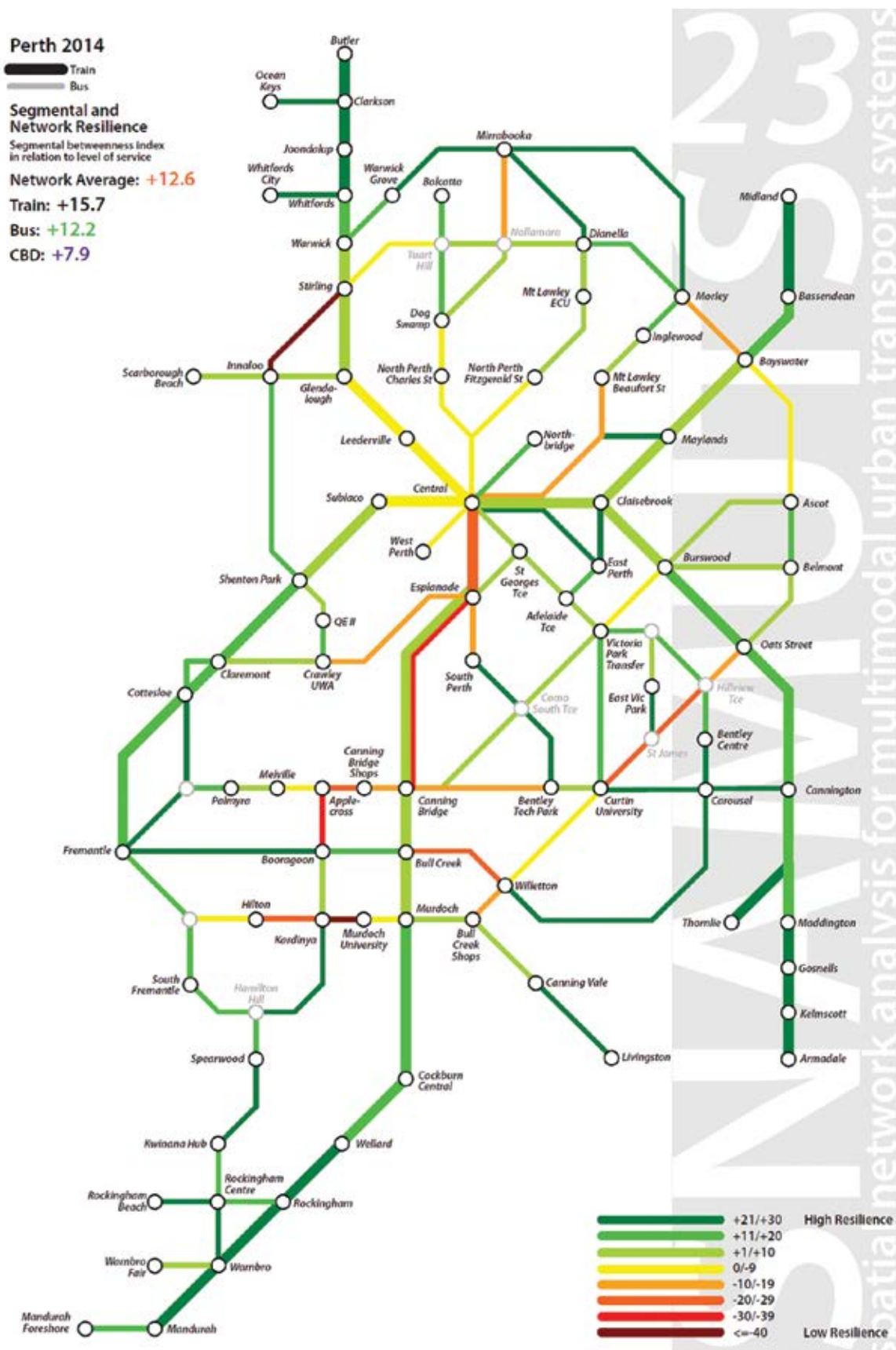


Figure 7f: Segmental and Network Resilience Perth 2014.



High stress values are frequently found on short bus feeder sections to rail lines - Innaloo to Stirling and Glendalough, Booragoon to Canning Bridge, Curtin University to Oats Street or Kardinya and Willetton to Murdoch. Here, the location of many rail stations away from concentrations of land use activity, much of Perth's north-south rail line is situated in a freeway median, is evident and highlights the need for land use strategies to focus on converting rail-bus transfer nodes to significant activity centres, as is the case at Murdoch, Stirling and Cockburn Central. Resilience figures also deteriorate on some radial bus corridors such as Alexander Drive between central Perth and Dianella in the north-east, central Perth and Crawley-UWA in the west.

Copenhagen and Helsinki achieve a higher rate of network resilience than Perth by providing more resources to their public transport networks, and by offering a greater number of attractive route choices that help users avoid lines or areas where congestion occurs.

The opening of the Mandurah line brought significant relief, averting a mounting capacity crisis on the public transport network. Since then there has been a gradual deterioration of resilience on the rail network, from a peak of +19.1 in 2008 to +16.4 in 2011 and a likely value below +15 in 2016. Daytime service levels were reduced in 2009 and have been stagnant compared to population and patronage growth since. Conversely, average resilience on the bus network improved following network and service improvements, from +7.4 in 2007 to +10.7 in 2011 and a likely stabilisation until 2016. Average network resilience in the CBD area however, is expected to worsen, suggesting that service and network measures are required both to increase capacity in the CBD and to offer more journey options that enable users to bypass the CBD area.

### 7.3.8 Nodal connectivity

This indicator measures the strength of each activity node for integration of multi-modal public transport services, and by extension, the flexibility of users to move around the city on public transport. It captures the suitability of activity nodes for making transfers or breaks of journey with minimal disruption to the flow of movement. Nodal connectivity can thus be seen as a proxy for the confidence that can reasonably be exerted by residents to build their activities around public transport use, or by businesses around public transport access.



Perth's average nodal connectivity is third lowest in the global SNAMUTS sample before Adelaide and Auckland. There has been a small improvement in average nodal connectivity since the Mandurah rail line was opened: in 2007, the average nodal value was 14, and 19 at 2011. In 2016, it is estimated be in the low 20s, but is much lower than the average performance of cities with greater concentrations of land uses in inner areas (Brisbane), or with larger public transport networks with a greater number of transfer points overall (Sydney and Melbourne).

Only in the very centre of Perth does it appear reasonable for residents and businesses to rely primarily on public transport to travel around the city, shown by the red dot on Figure 7g. Suburban centres suffer from a low number of converging lines and limited service frequencies, which restricts the number of destinations that can be reached with ease, and increases waiting times. This suggests that many suburban centres as well as CBD fringe areas would require significant boosts in service levels, as well as additional links in new directions if they were to become genuinely attractive locations for transit oriented development (TOD).

Larger cities like Melbourne and Sydney address this constraint by relying more on mid-capacity modes such as trams and ferries, rather than buses, and by offering more suburban nodes from where users can travel in many directions.

Vancouver and the Scandinavian cities have a more proactive policy to concentrate urban development around public transport interchanges with excellent service, and to maximise the number of such places. Considerable research over recent years has highlighted the negative effect of Park 'n' Ride in terms of displacing urban activities away from railway stations, and reducing their effectiveness as a transfer point and as an urban destination (Mees 2014; Imran & Matthews 2015).

**Perth requires orbital links  
and high frequency, direct  
connections between  
major activity nodes**



**Perth 2014**

- Train
- Bus
- Circle Route

**Nodal Connectivity**  
Ability of activity nodes to act as hubs for the network

**Total (for activity nodes): 1,841**

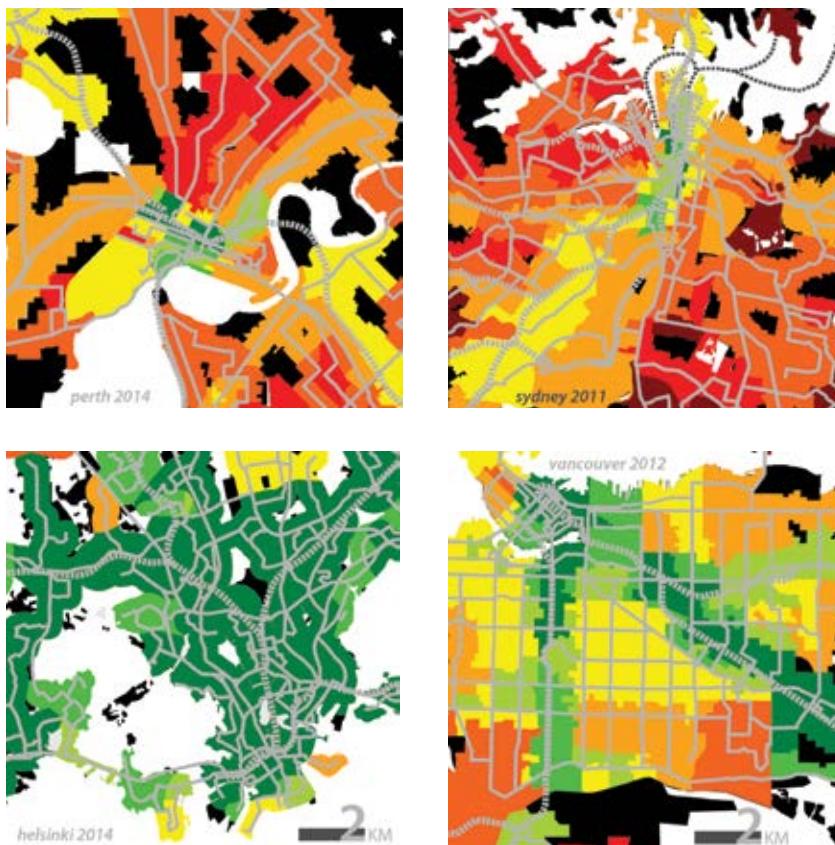
**Average: 21**



## 7.4 Summary and Conclusion

The characteristics and deficiencies of Perth's public transport system are most strongly highlighted by composite accessibility maps, which integrate several of the SNAMUTS indicators to provide a broad overview of the accessibility of each district within a city. These maps, comparing only a 12 kilometre square at the centre of each city, serve to highlight Perth's central city focussed system, especially in comparison to Helsinki or Vancouver, which have lines structured to allow transport in almost any direction.

This analysis strongly demonstrates that Perth's public transport system has an excessive emphasis on servicing the central city area, driven largely by efficiency and cost-minimisation goals. While this assists in reducing peak-period congestion on Perth's freeway and highway network, improving the level of service provided by Perth's public transport system will require a shift to servicing a broader range of destinations. This includes the provision of orbital links and more high frequency direct connections between major activity nodes.



### SNAMUTS Composite Accessibility Index



## 7.5 Summary of Key Findings

### Benchmarking the Performance of Perth's Public Transport System

The level of investment in operating services on Perth's network is quite low. However, Perth's sprawling suburban expanse makes building and operating lines expensive.

High train speeds on the Joondalup and Mandurah lines, designed to compete with the car, result in a lower number of trains required to operate them at a reasonable frequency compared to the older suburban railway lines.

Perth's rail network is operated at minimum 15-minute service frequencies seven days a week during the inter-peak period. This standard represents the best consistent service level found in any Australasian urban rail system, though in global terms it is relatively modest.

It is relatively easy to move around in Perth's public transport network. This is due to the high speed and consistent 15-minute inter-peak and weekend daytime frequency of the train system, and the good integration between trains and buses. The key weakness is the relative lack of compact clusters of intense urban activity outside the centre of Perth.

The spacing and speed of the rail lines result in cross-suburban journeys from one rail corridor to another generally taking longer by the Circle Route than by a rail transfer trip through central Perth.

The transfer intensity of Perth's public transport network is average among Australasian cities. Long train lines from one end of the city to the other and the Circle Route bus reduce the need for transfers, while the configuration of many bus lines as feeders to train stations increases it.

Public transport accessibility is poor in Perth compared to other Australasian cities. Perth only provides higher-frequency and full-time public transport within walking distance to less than half its residents and jobs.

Perth's lower rail station density plays a role in limiting network coverage/accessibility by walking.

The number of residents and jobs that can be reached within a public transport journey of 30 minutes or less is highest from the CBD (35%) and lowest from outer locations.

Perth's public transport network is highly centralised: it primarily services the CBD area and channels many suburb-to-suburb journeys through the central city. However this means that Perth's public transport system is successful in channelling travel opportunities along the high-performance rail system.

Perth's public transport network is currently comparatively resilient, however a continuing high rate of population growth will erode this advantage in the future without further substantial investment to increase the capacity in established and newly urbanised areas.

Only residents in the very centre of Perth could reasonably rely on public transport to travel around the city.

Perth's public transport system has an excessive emphasis on servicing the central city area, driven largely by efficiency and cost-minimisation goals.

Improving the level of service provided by Perth's public transport system will require a shift to servicing a broader range of destinations. This includes the provision of orbital links and more high frequency direct connections between major activity nodes.



## Section 8: Understanding Commuter Mode Choice in Perth and Peel

Ms Gemma Davis and Ms Georgia Harford-Mills  
Committee for Perth and The University of Western Australia

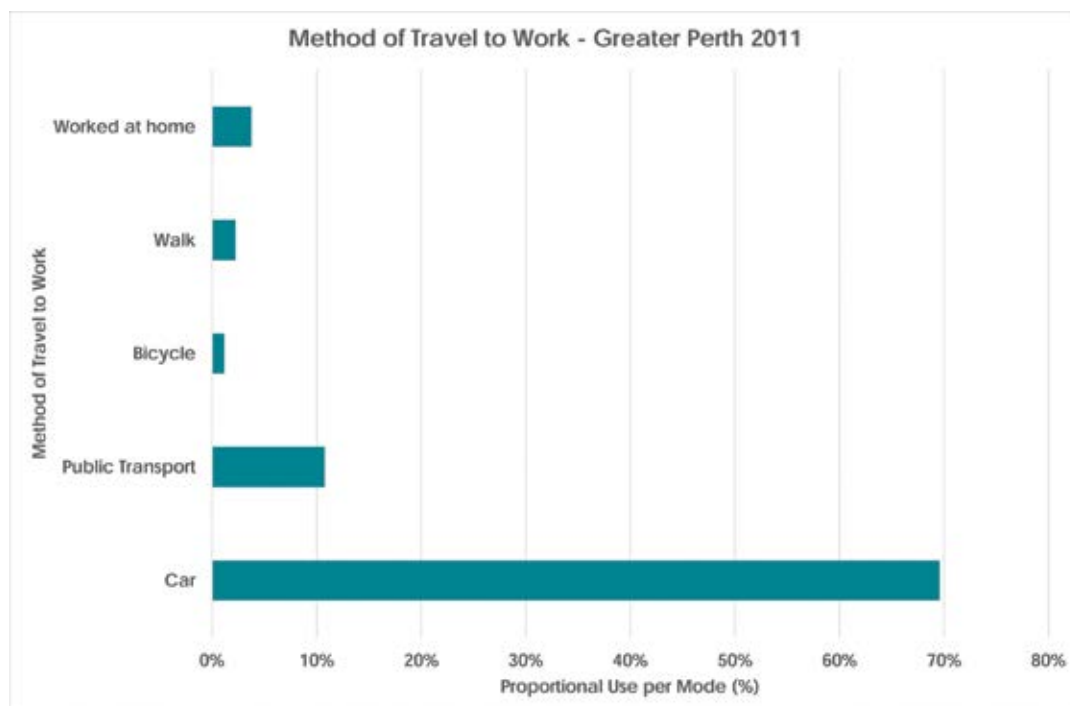
In Perth and Peel, car is the dominant mode choice for commuters. In total, 69% of all commuters travel to work by car, as a driver or passenger. Train and bus are the next most common commute choices, followed by working from home, walking and cycling (ABS, 2011).

This Section seeks to explain why commuters in Perth and Peel choose to travel to work via specific modes. It has been prepared by the Committee for Perth and examines the stated motivations of commuters; associations between environmental and social factors and mode choice; and major commuter frustrations through a detailed examination of the *Get a Move On!* Commuter Survey results combined with current published literature and statistics.

It also considers the stated preferences of commuters in an 'ideal world'; the underlying, sub-conscious factors that influence mode choice; and the proportion of commuters who are likely to shift modes voluntarily through a comprehensive examination of the *Get a Move On!* Commuter Survey responses.

It finds that people in Perth currently commute by car because it is faster and more convenient than public transport to most destinations. Public transport use is strongly destination driven i.e. it is perceived to be convenient, fast and affordable for travel to key destinations, particularly those that have limited access to free parking such as the Perth CBD. Public transport and active commuting is also more often preferred for short journeys. Young people, low income earners and white collar workers are most likely to be public transport commuters in Perth and Peel.

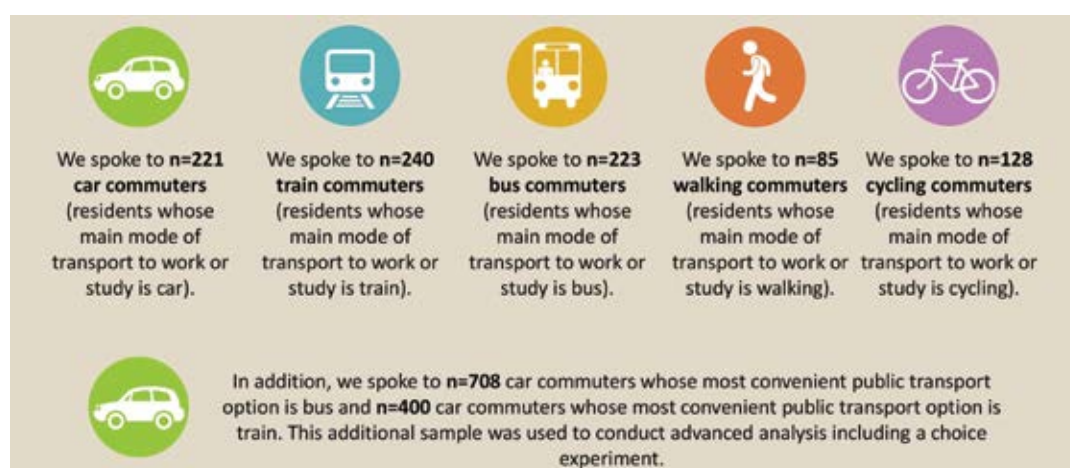
Figure 8a: Method of Travel to Work Greater Perth 2011  
(Source: ABS, 2011).



## 8.1 Get a Move On! Commuter Survey

The Committee for Perth commissioned Ipsos to undertake a survey of commuters as part of the Get a Move On! project. A survey of 2,005 commuters in Perth and Peel was conducted in October 2015 to identify motivations for choosing specific transport modes for their journey to work. The number of commuters surveyed by mode is outlined in Figure 8b below. A copy of the survey questions is provided at Appendix 2.

Figure 8b: Get a Move On! Commuter Survey Sample  
(Source: Get a Move On! Commuter Survey, 2015).

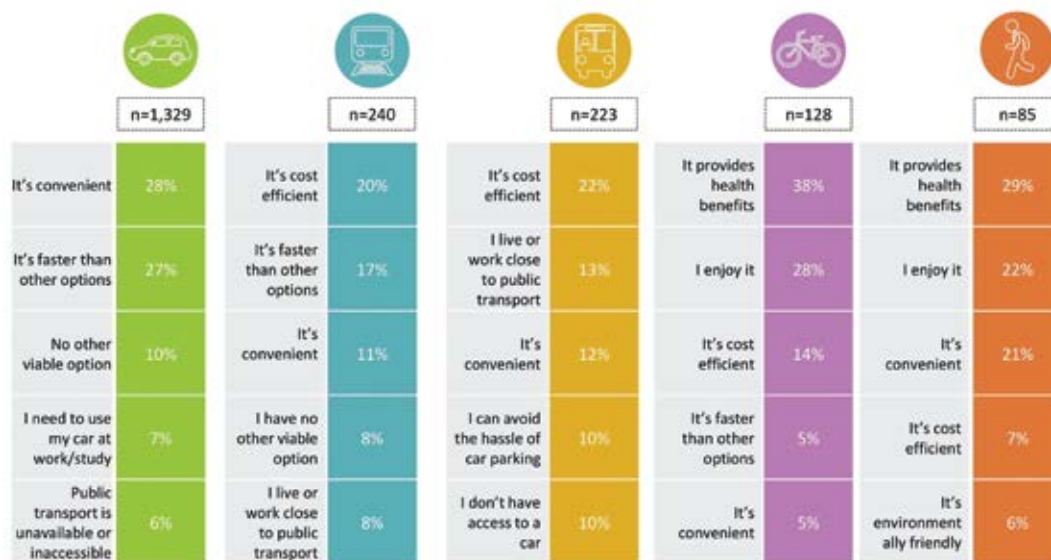


### 8.1.1 Stated motivations

The Get a Move On! Commuter Survey asked commuters to identify their motivations for choosing specific modes of transport for commuting in Perth and Peel. Respondents identified convenience and speed as central to decisions to commute by car; cost and speed as key motivators for train; cost and proximity as primary motivators for bus commuters; and health and enjoyment as underlying decisions to commute by walking and cycling. Figure 8c identifies the top five commuter motivations identified by each user mode choice.

Figure 8c: Top Five Commuter Motivations by Mode

(Source: Get a Move On! Commuter Survey, 2015).



The results above indicate that motivators for mode choice are relatively consistent among commuters but also that perception and experiences of transport convenience, speed, proximity and cost efficiency vary significantly from person to person, that is that the same motivator can lead to people making different mode choices.

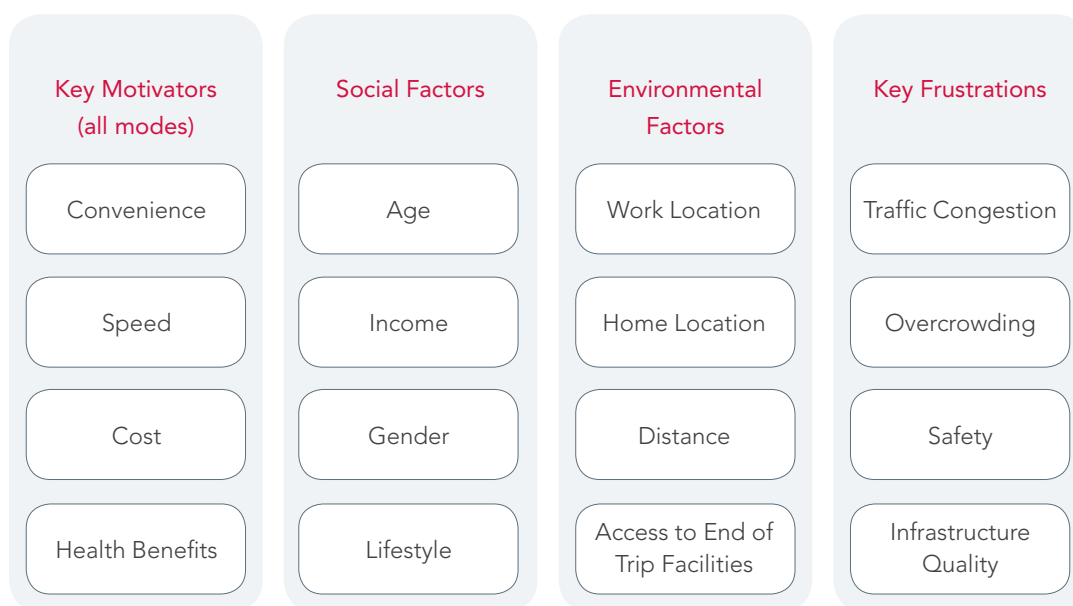
The reason for this is that motivators such as the convenience, speed, proximity and cost efficiency of transport, for example, vary considerably based on the profile, circumstances and environment of the individual commuter.

Key factors that have been identified through the Get a Move On! project as influencing commuter choices, include social factors such as the demographic and socio-economic characteristics of the commuter, as well as environmental factors including where the commuter works and the distance between their home and work location. Some of the key factors identified to influence mode choice and their impact on this choice for Perth and Peel commuters are outlined later.

**"My car takes me door to door"**



**Figure 8d: Key Motivators and Social and Environmental Influences**  
(Source: *Get a Move On! Commuter Survey, 2015*).



## 8.2 Key Motivator 1: Convenience

Convenience is a major motivating factor for all types of commuters but is a very strong motivator for car commuting. Of all of the car commuters surveyed, 75% identified convenience as a key motivator for their mode choice. Convenience is also a motivator for more than half of train commuters; 48% of bus commuters; and 74% of walking commuters – albeit for different reasons.

**Table 8a: Convenience – Commuter Quotes**

(Source: *Get a Move On! Commuter Survey, 2015*).

Convenience as a motivator for car (75%)	Convenience as a motivator for train (56%)	Convenience as a motivator for bus (48%)	Convenience as a motivator for walkers and cyclists (73%)
"It's easier"	"Ease of journey. Hate driving on the freeway at rush hour"	"I don't have the hassle of parking"	"It is much more convenient for me from a financial perspective and is also a much healthier option"
"I don't have to do anything"	"Can't stand driving on freeway - too much traffic"	"I live close to work, so bus is easy"	"Convenience, cheap and healthy"
"My car takes me door to door"	"Do not like peak hour traffic. Petrol costs are high. Train is so much easier"	"There is no point driving and parking for such a short journey"	"Fast, convenient, don't have to worry about traffic or parking or petrol, keeps me fit, and allows me a break between work life and home life"
"To use public transport I have to walk, then catch a bus, then a train, then a bus again"	"Traffic is awful. I can relax on the train"	"It would be stupid to drive when I'm only going 5km and there is a traffic jam the whole way"	"Just easy and saves money"

The convenience of car is strongly associated with flexibility. When people commute by car it provides them with freedom to leave home and work whenever they please. It also enables them to use their car to run errands during work hours; pick up kids; go shopping; visit friends; or travel to leisure activities straight after work.

This is a common motivation for choosing to commute by car in Perth and Peel. The *Get a Move On!* Commuter Survey found that respondents who are responsible for transporting children to and from school/activities are 4.4 times more likely to choose to travel by car.



#### Flexibility – Car Commuter Quotes

"I can leave for work and from work whenever I like"

"I sometimes work late and, after hours, public transport is too infrequent"

"I have to drop off and pick up kids and I just can't do it using public transport"



For train and bus commuters, convenience is associated with avoiding inconveniences and delays associated with driving on congested routes and finding car parking at their destination. A majority of walking commuters and a significant proportion of bus commuters also associate the convenience of a non-car journey with the short distance that they need to travel i.e. they do not perceive any major benefits associated with driving in traffic and finding car parking when their journey is short and can be undertaken easily by bus or on foot.

### 8.3 Key Motivator 2: Speed

Speed is a crucial motivating factor for commuters and is a primary motivating factor for choosing to commute by car. Seventy per cent of car commuters surveyed as part of the *Get a Move On!* Commuter Survey identified speed as a motivator to use their car to commute, and 27% of respondents identified speed as the main reason behind their mode choice. Journey speed is also a significant motivator for train users.

**Table 8b: Speed – Commuter Quotes (Source: *Get a Move On!* Commuter Survey, 2015).**

Speed as a motivator for car (75%)	Speed as a motivator for train (56%)
"Car is much faster"	"Commute time is not much longer than car and it is much more relaxing"
"Public transport takes too long, and if I miss a connection, it adds 15 minutes to my journey"	"It's quicker than traffic on the freeway, also a lot cheaper and more convenient"

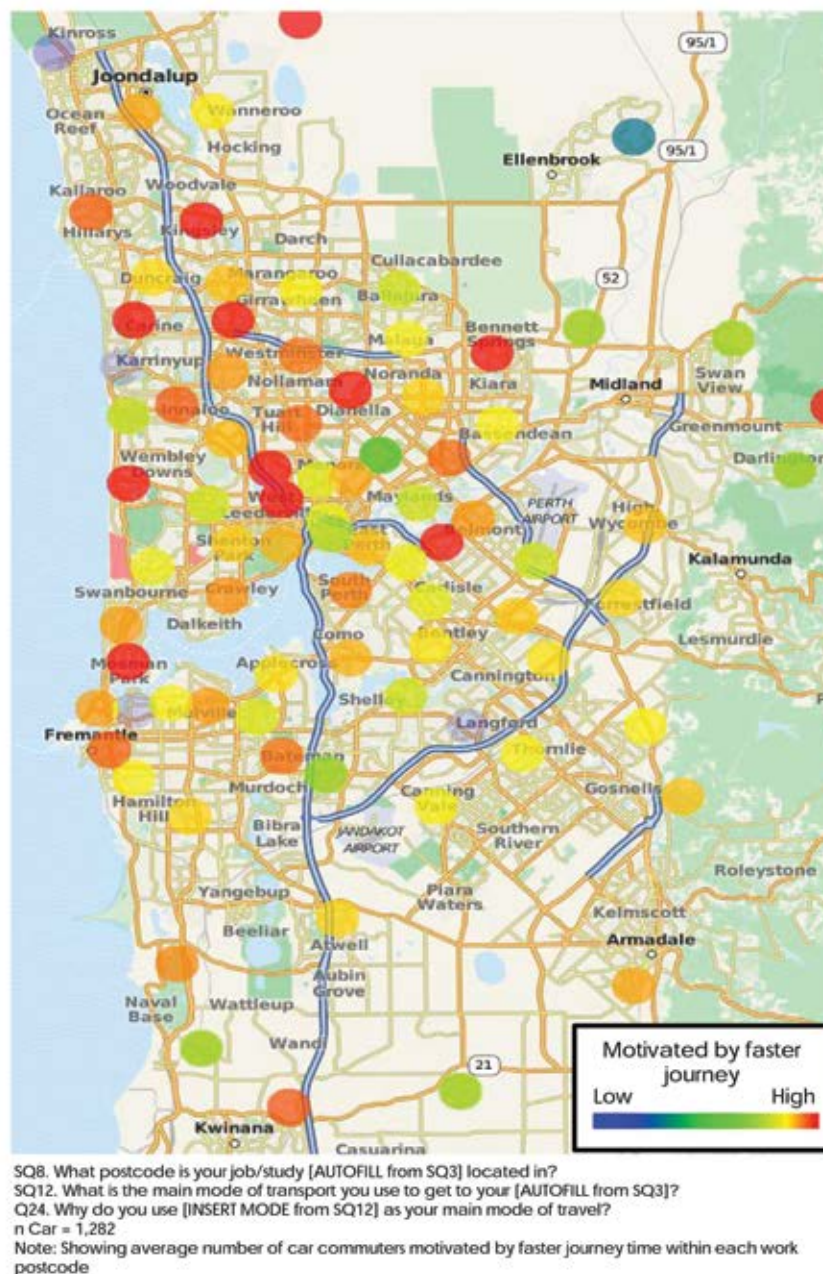
#### 8.3.1 Commuters choose car because it is faster than public transport

Car commuters who identify a faster journey as the primary motivation live in relatively dispersed locations but are more likely to work in non-CBD inner and outer locations. Figure 8e shows the spatial distribution of car commuters motivated by a faster journey by work location.

This suggests that a significant proportion of car commuters do have access to alternative mode options such as public transport, but widely perceive driving to be faster, particularly if they do not work in the Perth CBD.

Figure 8e: Motivation of Car Commuters by Work Location - Faster Journey  
(Source: Get a Move On! Commuter Survey, 2015).

### Motivation of Car Commuters by Work Location – Faster Journey



#### 8.3.2 Speed is a motivator for train commutes

Fifty six per cent (56%) of train commuters identified public transport as faster than other options and 17% identify speed as the primary motivator. These commuters are most likely to travel on the Joondalup and Mandurah lines.

#### 8.3.3 Speed is a less significant motivator for bus

Fifteen per cent (15%) of bus commuters identified speed as a motivating factor for choosing bus; however just 3% identified speed as the primary motivation for a bus commute.

#### 8.3.4 Car is the most efficient mode, but train can compete on direct journeys

An analysis of stated journey times and distances by car, train, bus and active modes has found the car is the most efficient mode of travel in Perth and Peel.

### 8.3.5 Traffic congestion increases potential for public transport choice

Train commuters who identify speed as a motivating factor are most likely to travel along congested road routes, such as the Mitchell or Kwinana Freeways. Bus commuters motivated by a faster journey are likely to identify congestion, as well as the time taken to park as increasing the time associated with car commuting.

### 8.3.6 Is car faster than public transport?

In order to examine perceptions of commuting speed in comparison to actual travel times, the speed of fastest possible morning peak (7.30am) car journeys and public transport journeys have been compared using TomTom MyDrive and Transperth's Journey Planner. Two analyses have been undertaken.

The first analyses journeys that have been chosen to reflect actual commute patterns to the top 10 employment destinations and metropolitan and specialised activity centres in Perth and Peel (see Figure 8f). Journey patterns have been identified from 2011 ABS Census data.

This analysis has determined that:

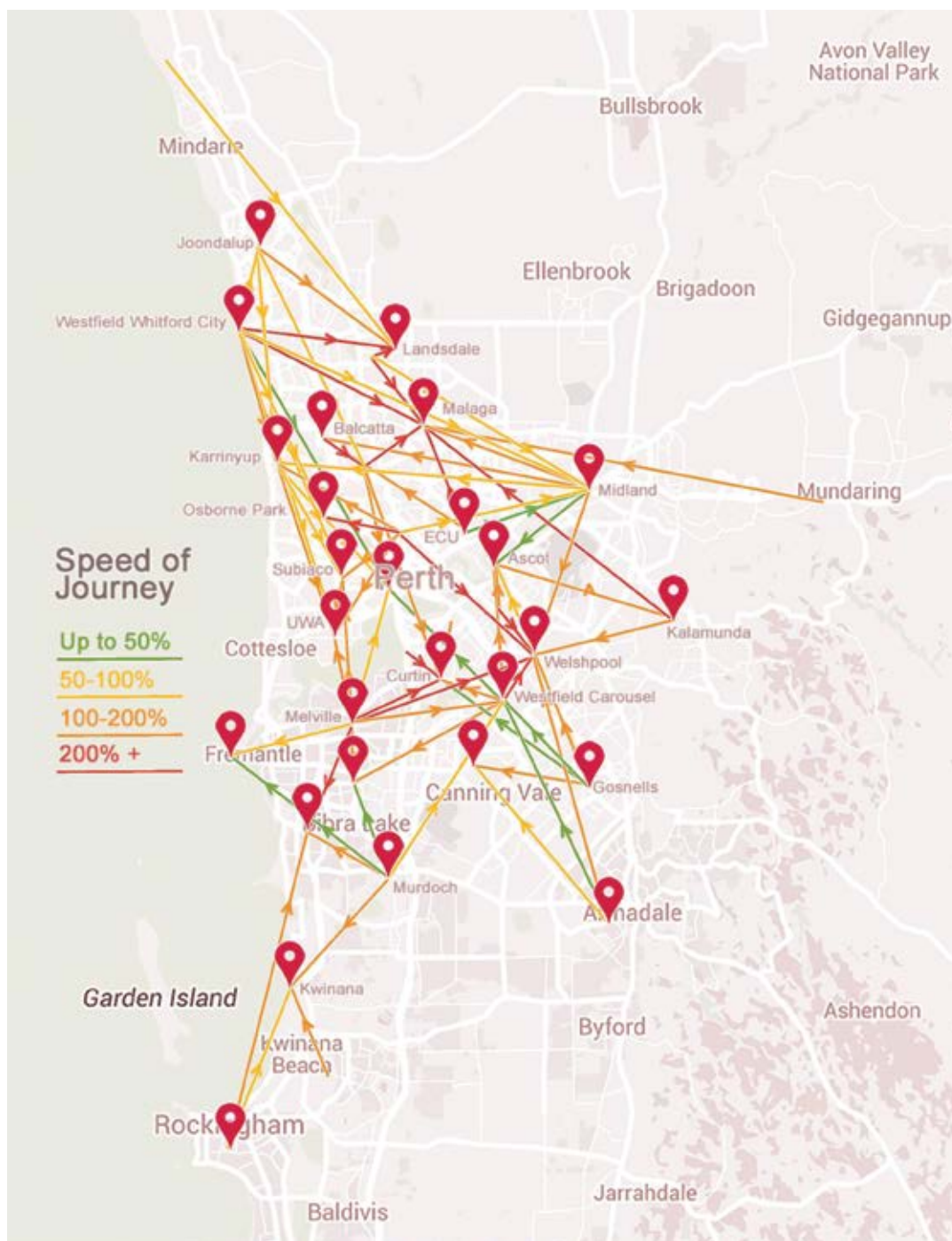
- On average, car is 102% faster for all journeys.
- Journeys that are most competitive with the car are journeys that do not require commuters to cross the Swan River and transfer through the Perth CBD.
- Journeys for which public transport is least competitive are journeys that require approximately 3 or more transfers and those which include transfers through the Perth CBD.
- Curtin University and UWA/QEII are two activity centres that attract a large number of potential public transport users but are significantly disadvantaged by speed of journey and the number of transfers required.
- Routes for which public transport can be faster than car are direct station to station journeys by train.

Key factors which increase the competitiveness of public transport compared to car include: single mode journeys; single mode journeys by rapid transport, like train; traffic congestion on the drive route; and shorter journeys on non-congested routes which increase the competitiveness of bus.

**Table 8c: Comparison of Speed of Car and Public Transport Journeys**  
(Source: Transperth, 2016; TomTom MyDrive, 2016).

Destination	Increase in time spent on PT	Ave number of PT transfers/destination	Ave delay due to PT transfers/destination
Perth Station	67.5%	2	27 mins
Joondalup Station	78.6%	1	25 mins
Midland Station	48.7%	2.75	20.75 mins
Osborne Park	149.0%	3	25.5 mins
Karrinyup Shopping Centre	118.6%	2.75	38.25 mins
Subiaco Station	86.6%	3.33	27.33 mins
UWA / QEII	133.2%	3	24.25 mins
Fremantle Station	40.2%	1.5	21.5 mins
Kwinana Industries Council	85.8%	2.67	23.67 mins
Westfield Carousel	51.4%	2	30.5 mins
Welshpool	200.6%	4	62.78 mins
Curtin University	167.4%	3	27.5 mins

Figure 8f: Percentage Increase in Travel Time for Journeys Undertaken by Public Transport instead of Car. Analysis of Key Home to Work Journeys (Source: Transperth, 2016; TomTom MyDrive, 2016).



The second analysis compares Tuesday morning peak period (7.30am, May 2016) journey times to key activity centres from 10 randomly selected origin locations distributed throughout the metropolitan region. This analysis aims to provide an additional indication of the difference in journey speed to key employment, health and study destinations from more dispersed locations throughout the region.

It also indicates that, for most journeys, the car is significantly faster than public transport but public transport is most competitive, based on the speed of the journey only, for journeys to central locations; for short local journeys; and for direct station-to-station journeys that do not require transfers through the Perth CBD. Public transport was found to be least competitive for journeys which require transfers through the Perth CBD and back out to inner-middle suburban activity centres, particularly where a mode change is required.



**Table 8d: Percent Increase in Time to Travel by PT Compared to Car (%) from 10 Dispersed Locations to Key Activity Centres**  
(Source: Transperth, 2016; TomTom MyDrive, 2016).

From	Duncraig (1km from station)	Bibra Lake (suburb central)	Maida Vale (suburb central)	South Fremantle (South Beach)	Mosman Park (station)	Gosnells (station)	Middle Swan (suburb central)	Champion Lakes (suburb central)	Wellard (suburb central)	Mindarie (suburb central)	Average Difference Between Car and PT
Perth (St Georges Tce)	13%	33%	91%	39%	91%	19%	37%	9%	-11%	11%	<b>33%</b>
West Perth (Hay Street)	46%	76%	100%	39%	17%	37%	47%	26%	0%	13%	<b>40%</b>
East Perth (Post Office)	19%	66%	97%	18%	22%	39%	44%	20%	0%	14%	<b>34%</b>
Joondalup (Station)	-14%	49%	84%	45%	38%	25%	83%	33%	0%	-12%	<b>33%</b>
Midland (Station)	71%	56%	79%	43%	0%	93%	103%	80%	36%	36%	<b>60%</b>
Armadale (Station)	21%	124%	91%	79%	44%	-20%	76%	83%	166%	20%	<b>68%</b>
Mandurah (City Council)	28%	57%	105%	37%	52%	41%	56%	113%	3%	12%	<b>50%</b>
Fremantle (Station)	18%	32%	79%	11%	-46%	45%	13%	56%	56%	9%	<b>27%</b>
Rockingham (City Council)	17%	-8%	121%	32%	76%	72%	57%	124%	50%	10%	<b>55%</b>
Stirling (Station)	27%	33%	106%	49%	111%	33%	88%	30%	0%	-13%	<b>46%</b>
Subiaco (Station)	15%	41%	69%	-22%	-38%	8%	21%	0%	-14%	5%	<b>9%</b>
Crawley (UWA)	7%	67%	95%	39%	16%	44%	73%	23%	-2%	15%	<b>38%</b>
Bentley (Curtin)	83%	126%	148%	127%	150%	36%	76%	28%	18%	37%	<b>83%</b>
Murdoch (University)	13%	17%	167%	63%	127%	113%	66%	96%	-41%	12%	<b>63%</b>
Cannington (Galleria)	37%	100%	100%	93%	152%	71%	127%	4%	36%	40%	<b>76%</b>
Perth Domestic Airport	97%	156%	139%	115%	138%	243%	236%	200%	62%	69%	<b>146%</b>

### 8.3.7 Service frequency is a key factor in perceptions of journey speed

The Get a Move On! Commuter Survey results indicate that perceptions of the speed of public transport are influenced by service frequency, which is also associated with convenience. A significant proportion of car drivers indicate that public transport is not a viable option for them because their journey requires one or more transfers and, if they miss a service or connection, it can add in excess of 20 to 30 minutes to their commute time.

An analysis of public transport service frequency to the top 10 commuter destinations from major origin local authorities supports this perception, with average service frequency identified as 13.4 minutes. This means that if commuters miss a transfer most face significant delays of between 10 to 30 minutes and up to 63 minutes.

**Figure 8g: Public Transport Journey Legs to Key Employment Locations**  
from Primary Origins (Source: Transperth, 2016; TomTom MyDrive, 2016).

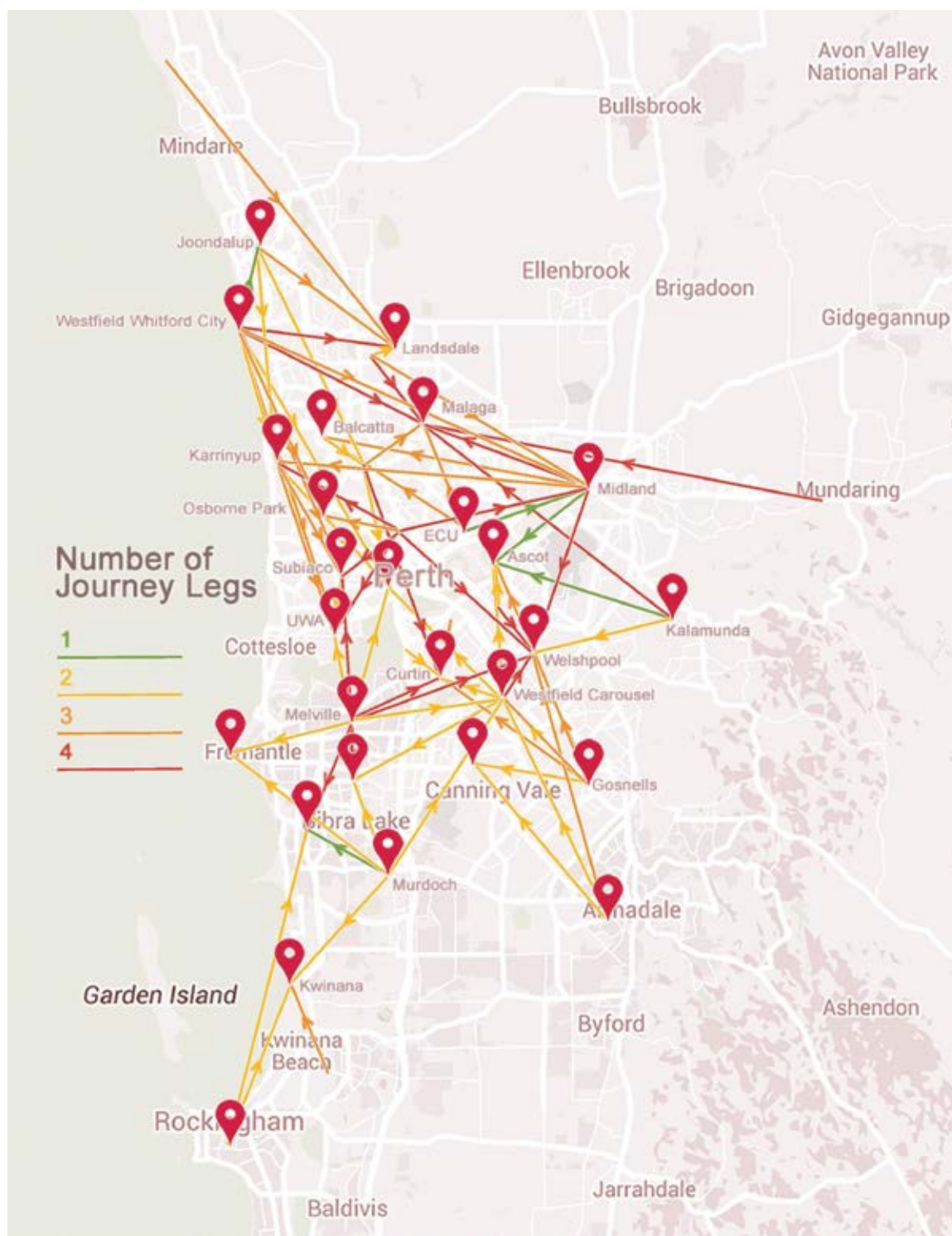
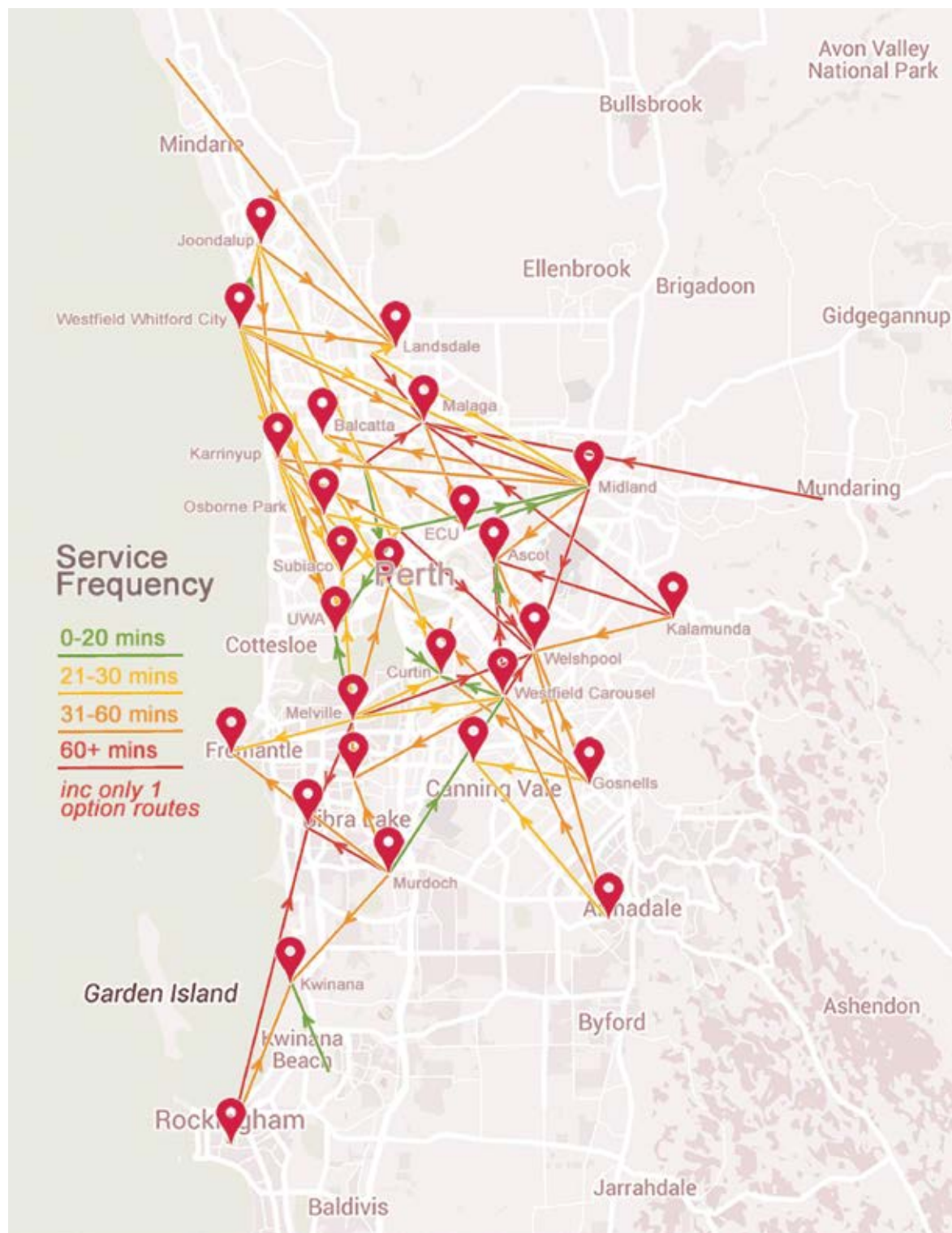


Figure 8h: Public Transport Potential Delay if Connection Missed to Key Employment Locations from Primary Origins  
(Source: Transperth, 2016; TomTom MyDrive, 2016).



## 8.4 Key Motivator 3: Financial Cost

Cost efficiency is a major motivator for public transport commuters and is a particularly important motivator for bus commuters. These commuters perceive public transport to be a cheaper transport option than driving a private car.

The *Get a Move On!* Commuter Survey found that if commuters earn between \$75,000 and \$100,000 per annum they are 5.6 times more likely to drive to work than if they earn less than \$20,000 per annum.

Previous analyses have determined that, in Perth and Peel, commuting by car is more expensive than commuting by public transport. This is due to the ongoing costs of car ownership; costs of vehicle depreciation; as well as day-to-day running costs such as parking and petrol (Committee for Perth, 2014).

However the *Get a Move On!* Commuter Survey responses suggest that unless commuters have very low incomes and cannot afford car ownership, a majority of car drivers do not consciously consider long-term costs, such as vehicle depreciation/wear and tear, in their everyday commute choices. As a result, a significant proportion of commuters perceive car to be more cost effective than public transport, and a number of people expressly identify cost as a barrier to public transport use.

The Commuter Survey outcomes also indicate that this perception is closely linked to access to free parking or low cost parking. That is, commuters who have access to free or low cost parking perceive car to be cost effective while commuters who pay for parking, particularly in the Perth CBD, are likely to perceive public transport to be a more cost-effective commuting option.

A requirement to pay for parking at the destination has the capacity to shift commuters from driving to public transport and active modes. For example, the *Get a Move On!* Commuter Survey found that 76% of car commuters have access to free parking at work compared to 38% of non-car commuters.

However there is also evidence that parking costs at work destinations need to be substantial in order to encourage car commuters to shift mode. As a result, while a number of employment destinations require some workers to pay for parking, this does not always facilitate significant mode shift. The *Get a Move On!* Commuter Survey identified the average cost of daily parking at employment destinations for car commuters as \$9.70. By contrast, commuters who work in the Perth CBD identified an average daily parking cost of \$18.42.

As a comparison, the current advertised price of a three zone public transport journey using a Smart Rider, with a 15% discount, is \$9.01 per day. The cost of parking at designated Park 'n' Ride stations along the rail system is \$2 per day.

This means that unless commuters work in a CBD or central location and are required to pay a significant amount for parking, the car is perceived to be a cost effective option compared to public transport, particularly for short journeys.

**Table 8e: Financial Cost – Commuter Quotes**

(Source: *Get a Move On! Commuter Survey, 2015*).

Train	Bus	Car
"Huge saving - paying for parking in the CBD is ridiculous"	"Much cheaper than driving"	"It costs less for me to drive because I don't have to pay for parking"
"Can't afford \$20 on parking in addition to car running costs"	"It's cheaper to use public transport than to pay and park. But if it was cheaper or free parking I would definitely drive as it's much quicker to get to work"	"I already pay to own a car, so it doesn't make sense to leave it in the driveway"



## 8.5 Key Motivator 4: Health

Personal health is the primary motivator for active commuters (cyclists and walkers). Cycle commuters are more likely to identify health and enjoyment as a primary motivator than walkers who travel significantly shorter distances on average.

The physical health benefits of active commuting are well documented and are very significant. Shephard (2008) found that walking for 1.9 km in 22 minutes twice per day, 5 days per week, or by cycling at 16 km/h for 11 minutes twice per day, 5 days per week provides people with the recommended level of exercise to reduce all-cause and cardiovascular mortality.

Commuting by active modes and public transport compared to private transport has also been found to significantly and independently predict lower Body Mass Index scores for men and women (Flint et al., 2014).

The *Get a Move On!* Commuter Survey also found that active commuters in Perth and Peel benefit from reduced stress associated with their commute – as well as increased enjoyment. The result is that active commuters are most likely to express satisfaction with their existing commute and have a preference to continue with active commuting in an 'ideal world'.

## 8.6 Environmental Factor 1: Work Location

Destination has been identified as the primary factor influencing mode choice in Perth and Peel. Specifically, working in the Perth CBD and inner locations increases the likelihood of choosing public transport, while working in outer locations increases the choice to commute by car.

Of all public transport commuters surveyed through the *Get a Move On!* project, 51% work in the Perth CBD (6000 postcode) and 76% work in central locations (600x; 6100 and 6101 postcodes). Similarly 32% of active commuters work in the Perth CBD (6000 postcode) and 65% work in central locations (600x; 6100 and 6101 postcodes).

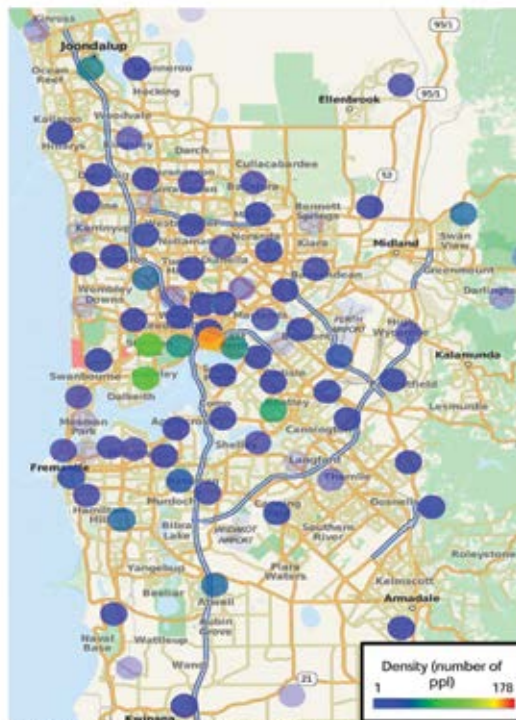
The strong relationship between choosing to commute by public transport and working in central locations is illustrated in Figures 8i to 8l across.





Figure 8i – 8l: Density of Commuters by Work Location by Mode  
(Source: Get a Move On! Commuter Survey, 2015).

#### Density of Car Commuters by Work Location



SQ8. What postcode is your job/study [AUFILL from SQ3] located in?  
SQ12. What is the main mode of transport you use to get to your [AUFILL from SQ3]?  
n Car = 1,282  
Note: Showing proportional distribution of car commuters within each work postcode

#### Density of Bus Commuters by Work Location



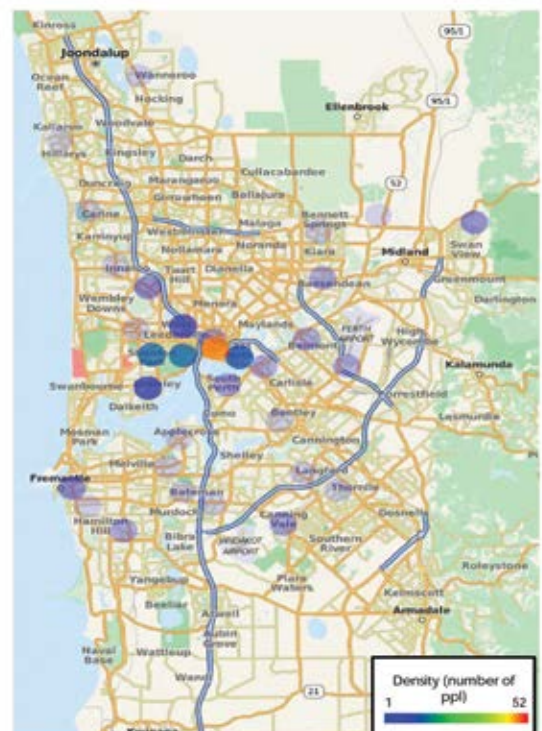
SQ8. What postcode is your job/study [AUFILL from SQ3] located in?  
SQ12. What is the main mode of transport you use to get to your [AUFILL from SQ3]?  
n Bus = 223  
Note: Showing proportional distribution of bus commuters within each work postcode

#### Density of Walk Commuters by Work Location



SQ8. What postcode is your job/study [AUFILL from SQ3] located in?  
SQ12. What is the main mode of transport you use to get to your [AUFILL from SQ3]?  
n Walk = 78  
Note: Showing proportional distribution of walk commuters within each work postcode

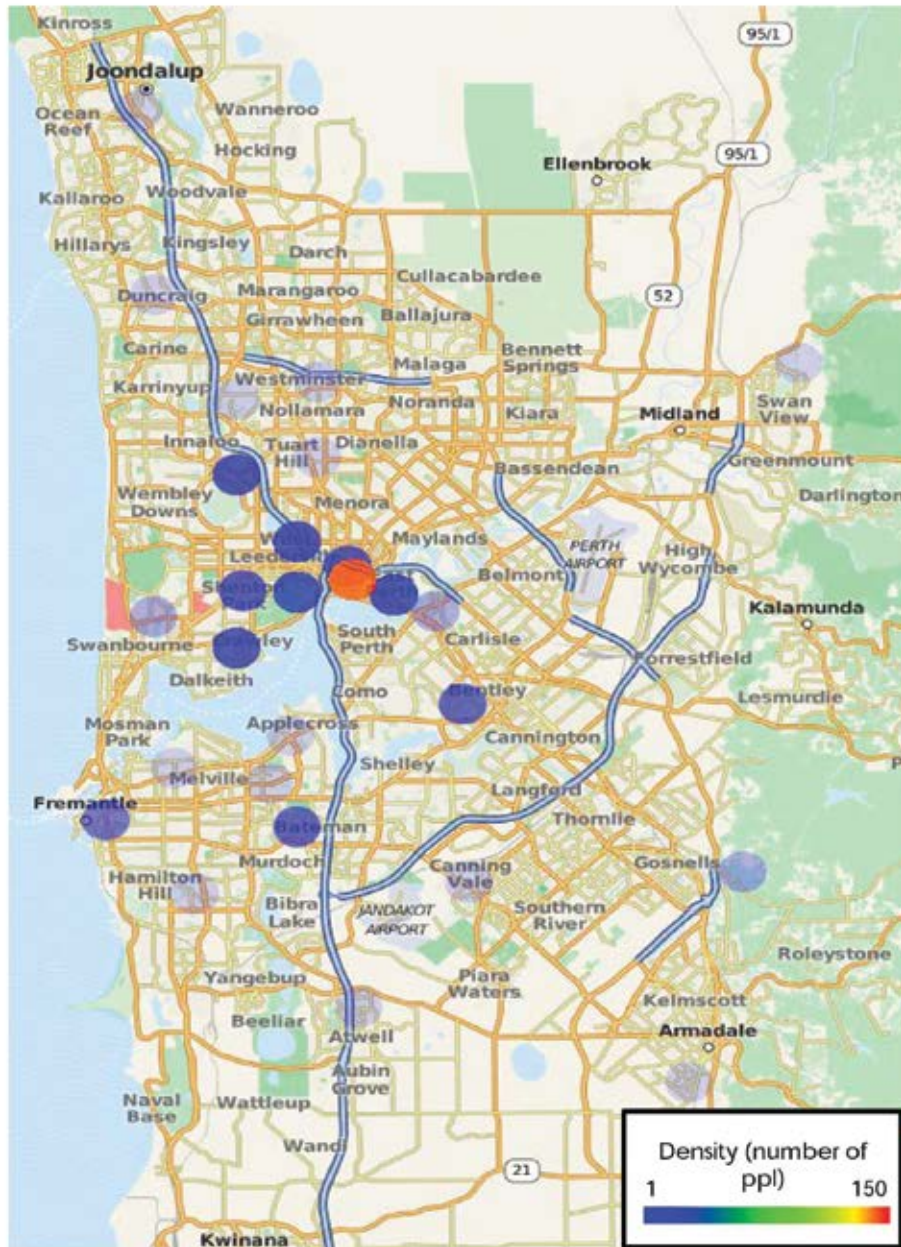
#### Density of Cycle Commuters by Work Location



SQ8. What postcode is your job/study [AUFILL from SQ3] located in?  
SQ12. What is the main mode of transport you use to get to your [AUFILL from SQ3]?  
n Cycle = 126  
Note: Showing proportional distribution of cycle commuters within each work postcode

Figure 8m: Density of Train Commuters by Work Location  
(Source: Get a Move On! Commuter Survey, 2015).

## Density of Train Commuters by Work Location



SQ8. What postcode is your job/study [AUTOFILL from SQ3] located in?  
 SQ12. What is the main mode of transport you use to get to your [AUTOFILL from SQ3]?  
 n Train = 238  
 Note: Showing proportional distribution of train commuters within each work postcode

The Perth CBD and inner locations exhibit a number of common characteristics, which have been identified as increasing their potential as strong non-car destinations. These characteristics are outlined in Table 8f across.



**Table 8f: Characteristics of Strong Non-Car Destinations in Perth and Peel**

Characteristics	Explanation
Accessibility	The central CBD is substantially more accessible and central employment locations are more accessible by public transport than other outer employment destinations.
Speed	An analysis of commuting speed has found that public transport trips to the CBD are among the most competitive with car from locations throughout the metropolitan region, with an average time difference of 14.8 minutes from key commuter origin locations north and south of the Swan River.
Barriers to car use	People who work in the Perth CBD and central employment locations are more likely to have access to paid parking.
Congestion	Commuters travelling along key north-south routes such as the Kwinana and Mitchell Freeways to the Perth CBD and inner locations are significantly influenced by traffic congestion.
Employment and residential densities	CBD and central locations have higher employment and residential densities than outer locations.
High quality employment	Knowledge/professional sector employment is concentrated in CBD and inner locations. People are strongly motivated to travel to access this type of employment.

## 8.7 Environmental Factor 2: Home Location

Home location also has a significant impact on commuter mode choice. The influence of home location on mode choice is strongly related to the commuter's work location, the distance between home and work and accessibility of both home and work by car; public transport; and active modes.

When examining the density of commuters by home location, it is evident that car commuters are more likely to live in outer locations than inner locations. However car commuters work throughout the region, with higher densities of car commuters identified as working within major inner and outer located activity centres.

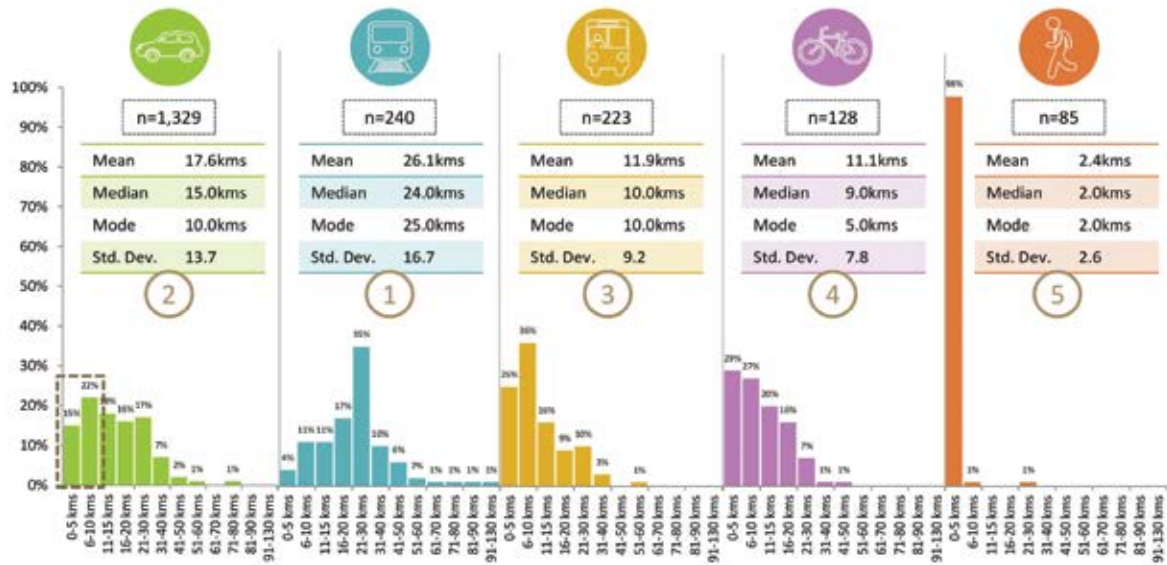
### 8.7.1 Environmental factor: distance between home and work

The influence of home location on mode choice is strongly related to the distance between home and work. The *Get a Move On!* Commuter Survey found that commuters who travel 30 to 40 kilometres to work are four times more likely to choose to commute by car than commuters who travel five kilometres or less to work.

The *Get a Move On!* Commuter Survey also identified that, while the home locations of car commuters are dispersed throughout the Perth and Peel region, bus commuters are more likely to live in locations within approximately 11 km of their work location and a majority of train commuters live more than 15 kilometres from work, with an average travel distance of 24 kilometres. Seventy six per cent (76%) of these commuters work in a CBD or central location.

The distance that active commuters are willing to travel varies considerably. Cyclists travel considerable distances with a median commute distance of 11.1 kilometres, while walking commuters live close to work, with a mean travel distance of 2.4 kilometres.

Figure 8n: Average Distance Travelled by Commuter Mode  
(Source: Get a Move On! Commuter Survey, 2015).



**"It would be stupid to drive when I'm only going 5km"**

## Density of Car Commuters by Home Location

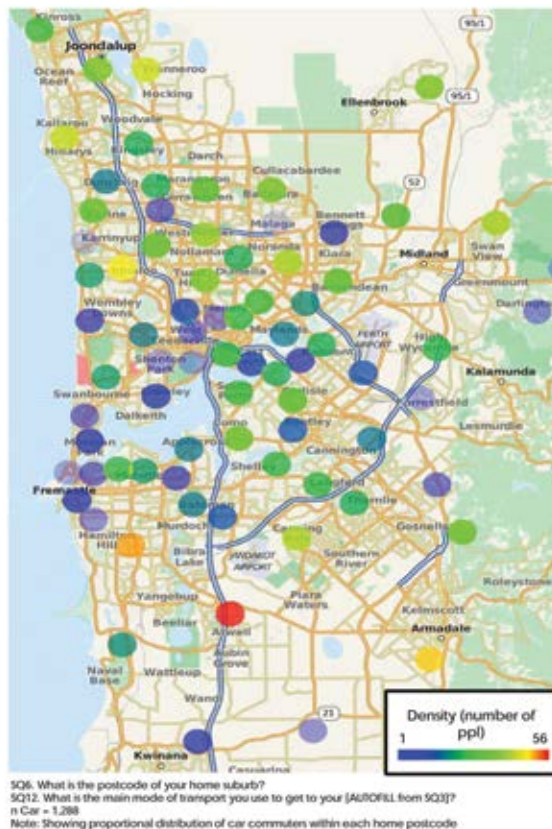


Figure 8o:

Density of Car Commuters by Home Location (Source: *Get a Move On! Commuter Survey, 2015*).

Mapping the home location of public transport users indicates that bus commuters are most likely to live in inner-middle areas within approximately 11 kilometres of the CBD. Higher densities of bus commuters are found in areas that are not well served by train.

Higher densities of train users are found in outer locations, reflecting the speed benefits of train. People who walk and cycle to work also live in central locations with higher densities of walking commuters agglomerated within 10 kilometres of the Perth CBD.

Figure 8p and Figure 8q:

Density of Active Commuters by Home Location (Source: *Get a Move On! Commuter Survey, 2015*).

## Density of Cycle Commuters by Home Location



## Density of Walk Commuters by Home Location





## 8.8 Environmental Factor 3: Access to Public Transport

Commuters who live in a location from which their work destination is accessible within a 60-minute public transport commute are more likely to choose public transport for commuting purposes.

The results of the *Get a Move On!* Commuter Survey indicate that the home location of train and bus commuters closely mirrors public transport accessibility patterns in the Perth and Peel regions. It found that, if people in Perth and Peel are able get to work within 50 minutes by public transport, they are five times more likely to choose to travel by public transport.

The relationship between public transport accessibility at origin locations and the residential postcode of public transport users is illustrated in Figures 8r, 8s and 8t.

**Figure 8r: Access to Employment within a 60 Minute Public Transport Commute in Perth and Peel (Source: Kelly & Mares, 2013c).**

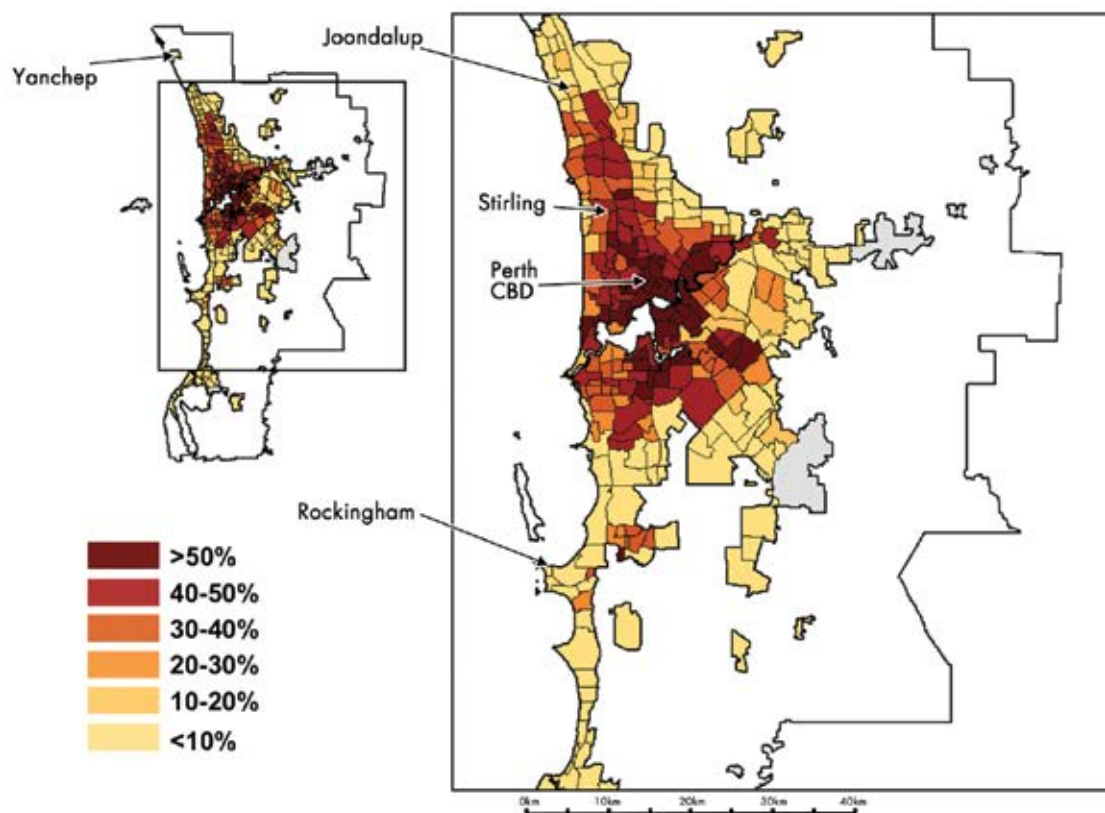
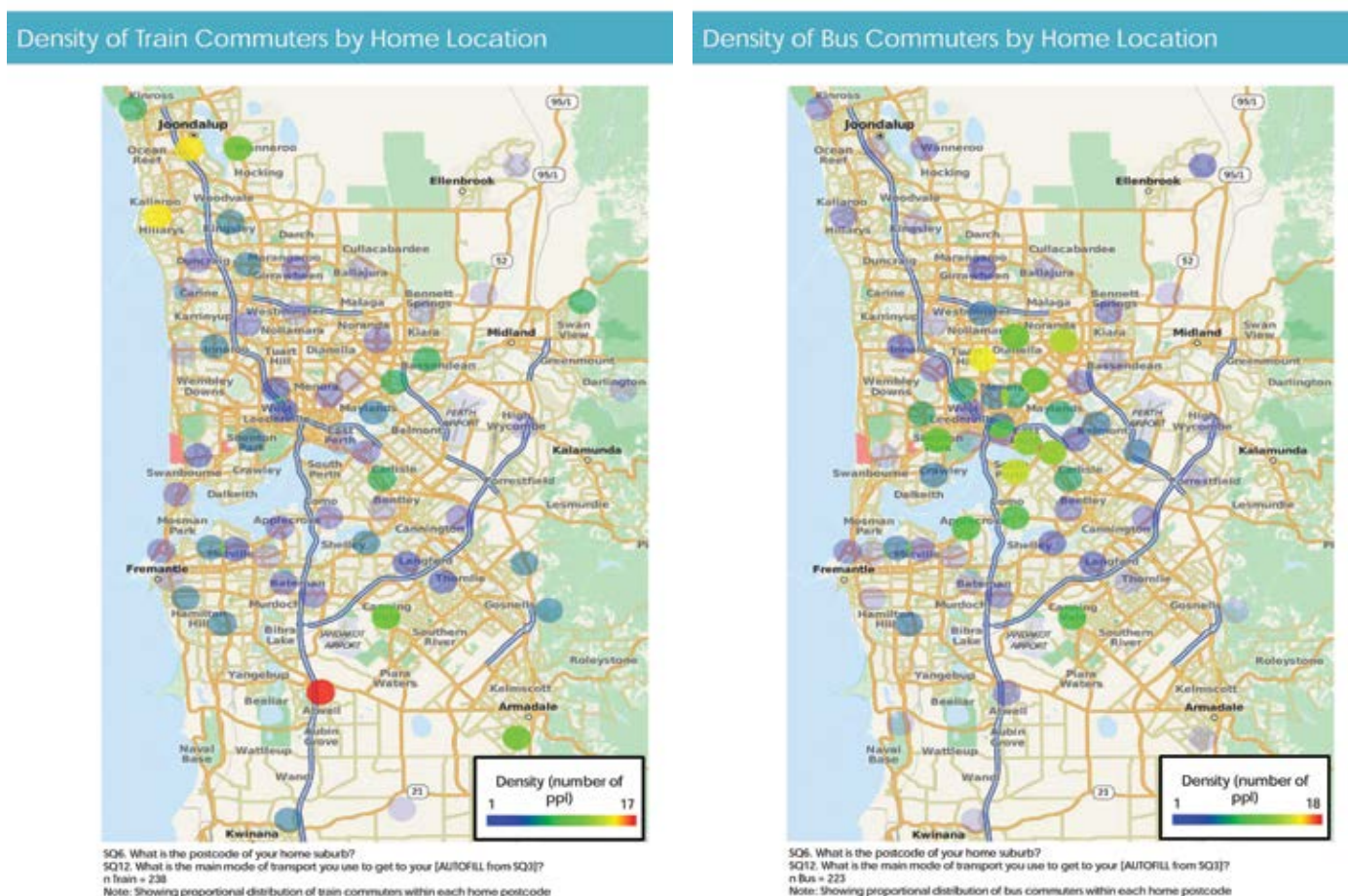


Figure 8r illustrates the proportion of employment that can be accessed within a 60-minute public transport commute while Figures 8s and 8t show the density of public transport commuters surveyed as part of the *Get a Move On!* Commuter Survey by home location.

Figure 8s and 8t: Density of Train and Bus Commuters by Home Location  
(Source: Get a Move On! Commuter Survey, 2015).



#### 8.8.1 Proximity to a bus stop

People who choose a bus commute as their primary mode are most likely to live within one kilometre of a bus service that links them with their destination, with an average of one transfer during the journey. Almost all bus commuters walk to the bus stop from home.

#### 8.8.2 Train station accessibility

The Get a Move On! Commuter Survey found that living within 4-5 kilometres of a train station increases the likelihood of travelling by train, particularly if the person also works in a location that is well served by train.

The survey responses combined with Department of Transport train station boarding and Park 'n' Ride data (2016) indicates that the catchment of railway stations is largest where stations are served by bus transfers and Park 'n' Ride facilities and lowest for stations without bus transfers and with few Park 'n' Ride bays.

People who live approximately 4 kilometres or more from the station are more likely to travel by bus or car to the station. This represents a majority of train users. The average distance that people are willing to walk to access a train station is approximately 1 kilometre. The majority of all public transport users work in central locations and the journey destination does not appear to influence the method of travel to the station.

**Table 8g: Mode of Transport to Train Station**

(Source: *Get a Move On! Commuter Survey, 2015*).

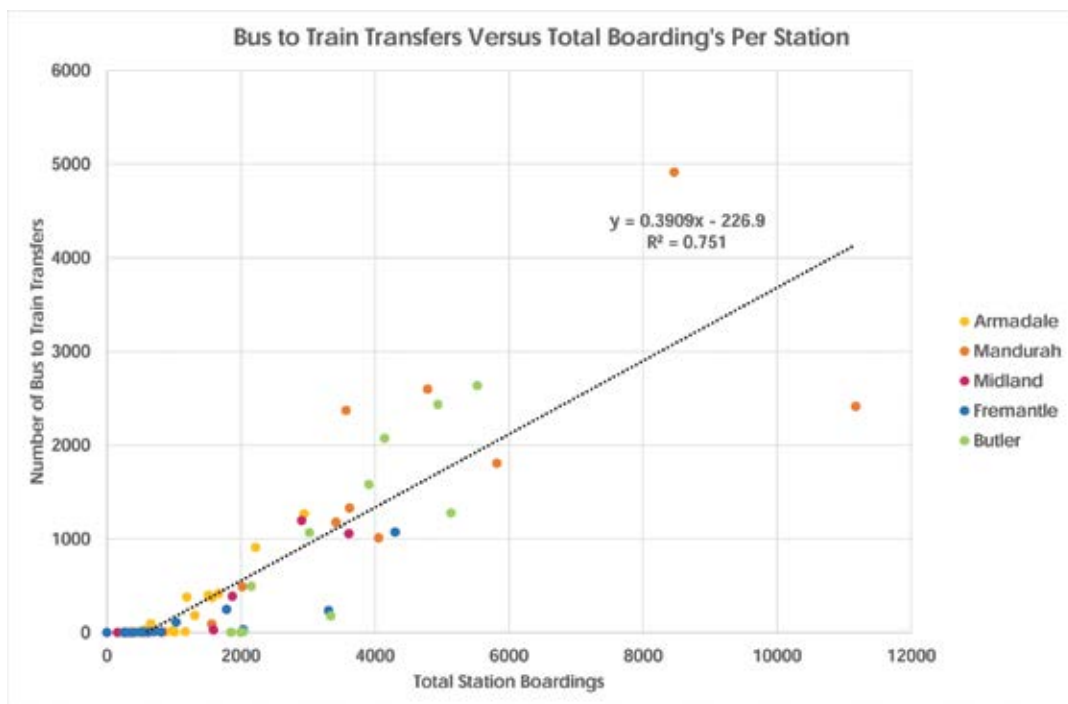
	Mode of transport used to access the train station					
	Bus	Drive and park outside designated Park 'n' Ride bays	Drive and use Park 'n' Ride bay	Get dropped off (Kiss 'n' Ride)	Walk	Other
Number of people	22.1%	7.1%	30.8%	8.8%	25.8%	5.4%
Average distance to station	5.74km	4.96km	5.18km	3.52km	1.08km	3.18km
Average time to station	16 minutes	11 minutes	9 minutes	7 minutes	9 minutes	16 minutes
Per cent working at 6000 postcode	56.6%	41.2%	62.2%	66.7%	50.0%	23.1%
Per cent working at 600X postcode	81.1%	76.5%	86.5%	81.0%	79.0%	69.2%

### 8.8.3 Relationship between method of travel to station and total boardings

Residential densities in the Perth and Peel region are low and, as a result, the public transport system is heavily reliant on bus transfers and Park 'n' Ride to enable train users to access train stations.

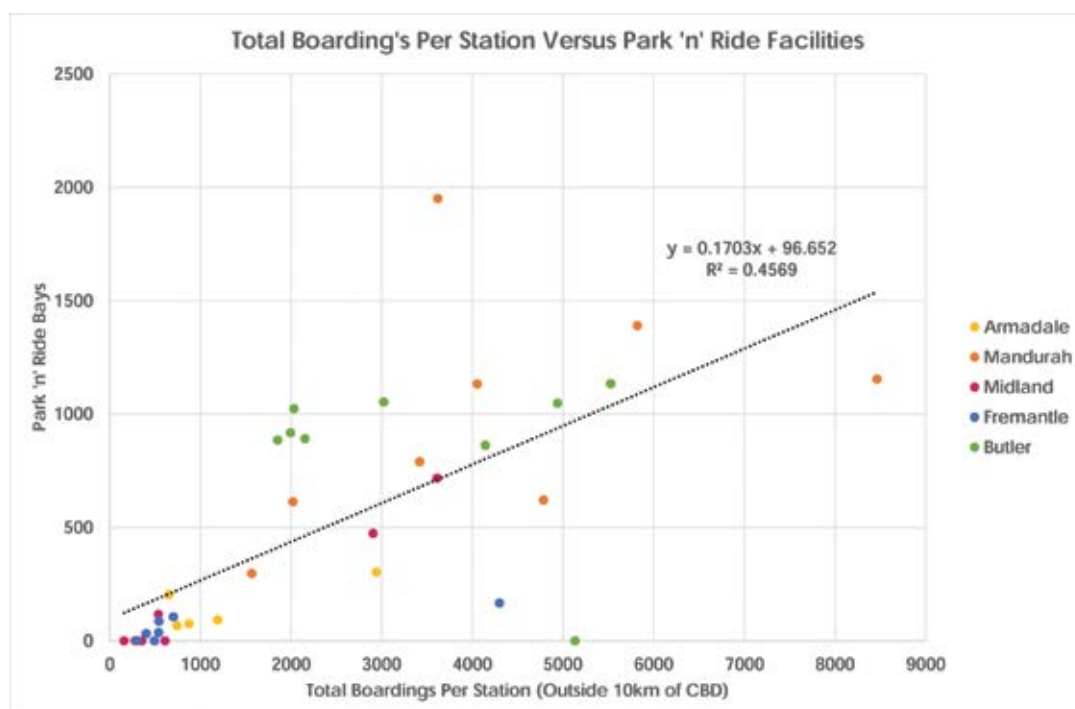
A statistically significant positive relationship is evident between the number of transfers from bus to train at a station and total boardings at a station per day ( $R^2$  value of 75%).

**Figure 8u: Comparison of Bus to Train Transfers Versus Total Boardings per Station** (Source: Department of Transport, 2015).



A positive relationship has also been determined between the number of Park 'n' Ride bays at a station and total boardings at the station ( $R^2$  value of 46%).

Figure 8v: Comparison of Total Boardings Per Station (Outside 10km of CBD) Versus Park 'n' Ride Facilities (Source: Department of Transport, 2015; Department of Transport, 2016).



The importance of Park 'n' Ride spaces to train station boardings is evident in Figure 8v above. It is noted that frustration with inadequate Park 'n' Ride bays at train stations was cited by 22% of current train users surveyed. Lack of parking was also identified as a barrier to changing the mode of 47% of car commuter respondents, who stated a preference to shift to train.

#### 8.8.4 High boarding stations exhibit common characteristics

Nine train stations in Perth (13%) that are located outside the Perth CBD attract 4,000 boardings or more per day. These stations are characterised by:

- Location on the Mandurah and Butler lines, with the exception of Fremantle station.
- High service frequency during morning peak periods, with an up to 10-minute frequency.
- More than 1,000 bus to train transfers per day.
- 55% have 1,000 or more Park 'n' Ride bays.

##### 8.8.4.1 Origin - Destination Stations

Four of the nine non-CBD stations that accommodate more than 4,000 boardings per day are located immediately adjacent to metropolitan, secondary or specialised activity/employment centres. These stations are likely to act as journey origin and destinations. They include Fremantle, Joondalup, Cockburn and Murdoch.

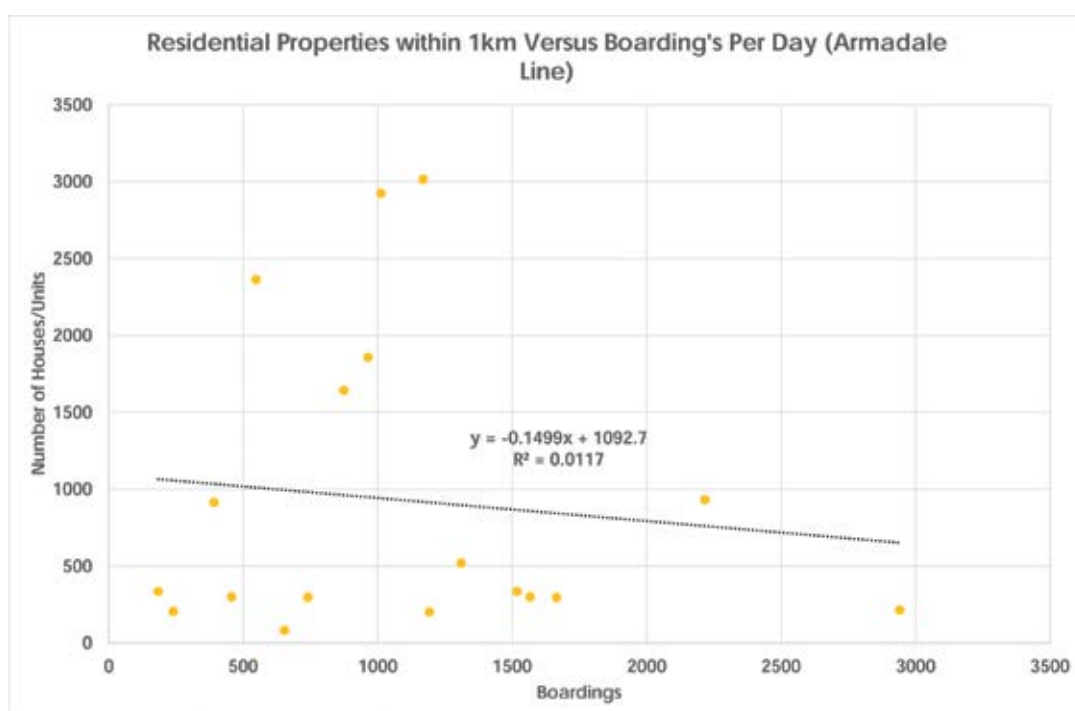
Overall, train stations located immediately adjacent to metropolitan, secondary or specialised activity centres attract 31% more daily walking, cycling or Kiss 'n' Ride boardings than stations immediately adjacent to residential land uses, lower order activity centres, or low-density employment land uses.

Murdoch station attracts the highest number of boardings of all train stations outside the Perth CBD (8,484 boarding's per day). Murdoch station has a high proportion of bus to train transfers and Park 'n' Ride bays, but also draws more than 2,000 additional (i.e. walking, Kiss 'n' Ride or cycle) boardings. The location of the station within the walking catchment of Fiona Stanley Hospital and Murdoch University appears to play a significant role in attracting train boardings at Murdoch station.

### 8.8.5 Higher residential densities and train station boardings

A detailed examination of the Armadale train line, selected due to significant variation in residential densities along the route, has not identified a statistically significant relationship between the number of dwellings within a 1 kilometre catchment of the train station and total boardings or total non-bus/Park 'n' Ride boardings at the station.

**Figure 8w: Relationship between Number of Residential Properties within 1km of Stations and Station Boardings Armadale Line**  
(Source: Department of Transport, 2015; REIWA, 2016).



This may reflect the relative low-densities of residential land uses, that is there are too few train stations where surrounding residential densities are sufficiently high to significantly impact on daily boardings.

It is also likely to be influenced by other factors such as the dispersed patterns of employment in Perth and Peel and the relatively small number of residents who work at employment destinations that are directly served by the train line, such as people who live near a train station but do not always work near a train station.

### 8.8.6 Characteristics of low use train stations

A significant number of train stations, 29 stations or 41% in Perth, attract fewer than 1,000 boardings per day with boardings at some stations as low as 157. Characteristics common to stations that attract fewer than 1,000 boardings per day include:

- Located on a 'heritage line' such as the Midland, Armadale or Fremantle line.
- No more than 200 Park 'n' Ride bays.
- Fewer than 100 bus to train transfers, 93% have fewer than 20.
- Lower morning peak service frequency, up to 20-minute peak frequencies.
- Residential land uses (only) or residential and/or low-density employment land uses within a 1 kilometre walking catchment.



## 8.9 Environmental Factor 4: End of Trip Facilities

The *Get a Move On!* Commuter Survey also identified the influence of access to end of trip facilities on commuter mode choice.

It found that, of all active commuters, 80% had access to end of trip facilities. This number was highest among cycle commuters, with 88% having access to end of trip, compared to 67% of walkers.

Having limited or no access to end of trip facilities was identified by some commuters as a barrier against switching to an active mode of commute.

Of the 32% of commuters who identified an active mode of commute as their preferred choice, 71% of these commuters are currently using an alternative mode, such as car or public transport.

41% of commuters who identified an active commute as ideal and who were currently using an alternative mode of transport identified that they did not have access to end of trip facilities. 22% of commuters who had no access to end of trip facilities specifically stated this as the reason behind not choosing to commute by an active mode of commute. In total, 6% of commuters stated their ideal mode of transport was an active mode and specifically identified a lack of end of trip facilities as the main barrier against using this mode.

## 8.10 Social Factors Influencing Mode Choice

Social and demographic characteristics are also known to have an impact on commuter mode choice. This section provides an overview of the impacts of gender, age, income, profession, lifestyle and car ownership on commuting choices in Perth and Peel.

### 8.10.1 Gender

Census statistics and the *Get a Move On!* Commuter Survey suggest that in Perth and Peel, while similar proportions of men and women use public transport, gender can influence active transport and vehicle mode choices.

ABS 2011 Census data indicates that, in Greater Perth, men make up 54% of the workforce and women 46%. A large majority (82%) of male workers in Western Australia are employed full time compared to 51% of female workers.

Census data also indicates that female workers in Greater Perth are more likely to be train users than men. In 2011, 46% of the workforce was female, women made up 50% of train commuters and 60% of train Kiss 'n' Ride users. Females make up a proportional 46% of bus users (ABS, 2011).

Women are also significantly more likely to work from home than men, with 61% of telecommuters on the day of the 2011 Census being female (ABS, 2011).

By contrast, in Greater Perth men are more likely to commute by bicycle and motorcycle than women. In particular, males make up 80% of cycle commuters in Greater Perth. Women are, however, better represented amongst walking commuters at 48% (ABS, 2011).

The *Get a Move On!* Commuter Survey, in contrast to international literature, found that women in Perth and Peel have a high propensity and preference for driving and are more likely to choose car as their 'ideal mode' than men, 40% compared to 35%.

It also found that, for many women, travelling by car is associated with responsibilities for transporting children.

The survey found that 77% of commuters who are responsible for transporting children to and from school, day-care or activities travel to work by car. Seventy-six per cent (76%) of these commuters are female. The *Get a Move On!* Commuter Survey also found that the age of children within the household has little impact on parental transport responsibilities, which means that parents are just as likely to be responsible for transporting high school age/teenage children to school/activities as preschool and primary school age children.

### 8.10.2 Age

The age of commuters has a very significant impact on mode choice. In Australia, commuters aged between 15 and 35 are over-represented among public transport users, while workers aged 40 and over are under-represented (ABS, 2011).

It is further noted that ABS data indicates that commuters aged 15 to 19 years are significantly over-represented in the 'car as passenger' mode category. This is likely to reflect an international and nationwide trend for school children to travel by non-active modes to school, and could reduce the likelihood of young people choosing non-car modes as they move into adulthood (University of South Australia, 2015).

However, travelling by car as passenger also has some positive benefits, with young adults continuing to be more likely to travel as a car passenger until they reach their thirties.

**Table 8h: Age Breakdown of Commuters by Journey to Work Mode Choice**  
(Source: ABS, 2011).

	Proportion of Total Commuters (%)	Car as driver	Car as passenger (% of total in each age group)	Walk	Cycle	Train	Bus
65-69 years	2	2	1		1	1	1
60-64 years	6	6	3		3	4	4
55-59 years	9	9	5		7	6	6
50-54 years	11	12	7		10	8	7
45-49 years	12	13	7		12	9	8
40-44 years	12	12	7		14	10	9
35-39 years	11	11	7		14	11	10
30-34 years	10	10	9		13	14	13
25-29 years	11	11	12		12	17	18
20-24 years	10	10	13		8	14	14
15-19 years	5	3	28		7	5	10

In recent years, significant attention has been given to the travel preferences of young people or 'millennials' and the findings of international research which indicates that young people, aged 16 to 34, are more likely to travel by public transport than in the past, with priorities for investment in technology rather than cars and preferences for a 'hands free' commute.

In Perth, transport statistics indicate that young people in the 15 to 34 year old age cohort are more likely to be public transport users and are particularly more likely to be bus users than people in older age brackets.

Yet insights from the *Get a Move On!* Commuter Survey suggest that this is more likely to reflect affordability and associated barriers to car use than preferences for non-car modes.

The reasons that young people are more likely to use public transport are multifaceted. The Survey results indicate that in Perth, the most common reason cited by commuters aged 18 to 34 years for public transport or active commuting are:

- Cost of driving/parking (25%).
- Not owning/having access to a car/no drivers' licence (25%).
- Preference for a stress-free/hands-free commute (18%).

Public transport commuters who cite cost, lack of car access or not having a drivers' licence as reasons for public transport use almost unanimously state a preference for car commuting in an 'ideal world'. This is particularly evident among 18 to 24-year-old respondents who were the group least likely to choose public transport, walking or cycling as their ideal mode of travel to work.

However, people within the 18 to 34-year cohort who choose public transport or active commutes due to exercise, health or lifestyle reasons almost unanimously state a preference to continue to commute by public transport or active modes in the future.

In Greater Perth, and in other major Australian metropolitan areas, people aged 35 years or older are less likely to commute by public transport and the proportion of people who choose to commute via alternative modes falls significantly after age 45.

Yet the *Get a Move On!* Commuter Survey indicated that people aged 35 or older are significantly more likely to choose a non-car commute as their 'ideal mode' with 66% of survey respondents aged over 35 identifying a non-car commute as 'ideal' compared to 57% of respondents aged 35 years or younger.

In addition, people aged 40 or over who do currently commute by public transport and active modes are far more likely to do so due to health and lifestyle reasons, with 68% of people aged 40 or over citing health, lifestyle and reduced stress as reasons for choosing public transport or active commuting.

This suggests that in Perth and Peel, commuters aged 40 or over are likely to have fewer barriers to car use and, as a result, use of a non-car mode is more likely to reflect personal motivations and preferences. Non-car commuters aged over 40 years are also less likely to select a preference to shift to car in an 'ideal world'. For example, 12% of non-car commuters aged 40 or over would choose to shift to car in an 'ideal world', compared to 25% of non-car commuters aged between 18 and 35 years.

For the majority of people aged 35 and older, public transport use is currently discretionary and the *Get a Move On!* Commuter Survey responses indicate that, while people within these age cohorts like the idea of commuting by public transport and active modes, shifting them from their cars to public transport would require substantial improvements to the speed and convenience of the system in comparison to car.

### 8.10.3 *Income*

Income has been identified as a significant factor influencing mode choice in cities and regions around the world. The *Get a Move On!* Commuter Survey results also confirmed that income is a factor influencing mode choice in Perth and Peel. Income also influences preferences and attitudes towards public transport.

Income was found to have a significant impact on the behaviour of very low income earners, that is people earning \$20,000 or less, 60% of whom were identified as currently commuting by public transport, walking or cycling. The most common modes were bus (30%) and train (16%).

However, when asked to identify their preferred mode, these commuters were more likely to identify a preference for car (37%), walking (24%), or cycling (16%).

Overall car commuters were found to represent a broad range of income groups in Perth and Peel, however very high income earners are more likely to drive to work than very low income earners. For example, 63% of people surveyed who earn more than \$250,000 per annum travel to work by car. Cycling was also a popular mode choice for this group, 14% of this group cycle compared to 6% of the total survey sample.

Train is the chosen mode of public transport for workers earning more than \$100,000 per year. Forty-five per cent (45%) of train commuters surveyed indicated that they earn more than \$100,000 per annum, compared to 31% of bus commuters.

Twelve per cent (12%) of respondents who earn in excess of \$250,000 also indicated that they travel to work by train, while 8% said that they travel by bus. When asked to select their preferred mode of travel in an 'ideal world', 63% of commuters who earn in excess of \$100,000 selected a non-car mode with the most popular preferences among this group being cycle (36%), train (33%) and walk (23%). Thirty-five per cent (35%) identified a preference for car.

High income earners were also more likely to identify non-car modes as their ideal travel mode than low income earners, with a strong preference for cycling and train travel. Thirty-four per cent (34%) of respondents who earn more than \$250,000 per annum identified cycling as their preferred mode of travel followed by car (23%), train (20%) and walking (15%).

### 8.10.4 *Profession*

Mode choice is also impacted by the profession of the commuter. This relationship is associated with both the requirements and hours of different types of jobs as well as the spatial location of different employment types.

This research has found that 'white collar workers' such as professional service sector workers, clerical and administration workers are more likely to travel to work by public transport than shift workers, trades workers, teachers or health workers.

Workers who identified that they need their car for work, to transport goods, tools or materials to work, or who work hours which make public transport use difficult include:

- Shift workers;
- Construction and trade workers;
- People who work in industrial areas.

### 8.10.5 Health, lifestyle and non-car choices

Commuter mode choice and preferences are also linked to non-commute active travel and travel behaviour and the *Get a Move On!* Commuter Survey responses indicate that people who have tried public transport are more likely to commute by public transport. Similarly, people who said that they have walked for more than 10 minutes to reach a destination within the last month are more likely to be public transport and active commuters than people who have not walked for 10 minutes or more to reach a destination.

The *Get a Move On!* Commuter Survey responses indicate that:

- Respondents who state that they have used a train in the past 12 months are 5.1 times less likely to choose to travel by car than people who have not caught a train in the past 12 months.
- Workers who have used a bus within the past 12 months are 3.6 times less likely to commute by car than people who have not used a bus within the past year.
- Commuters who have cycled within the past 12 months are also five times more likely to cycle to work than people who have not cycled within the past 12 months.
- People who commute by train, bus or active modes were more likely to indicate that they have walked continuously for 10 minutes or more to reach a destination within the past month, than people who commute by car.

**Table 8i: Proportion of Commuters by Mode Who Have Walked to Various Destinations within a Given Time**  
(Source: *Get a Move On!* Commuter Survey, 2015).

Mode Choice/Walking to a destination within past 4 weeks	Car	Train	Bus	Bicycle	Walk
Walked 10 mins	25%	41%	27%	30%	41%
Walked 20 mins	6%	8%	10%	2%	7%
Walked 25 mins	6%	7%	10%	5%	9%
Walked for 30 mins	4%	3%	4%	6%	7%
Walked for more than 30 mins	10%	9%	12%	28%	19%

It is further noted that a substantially higher proportion of cycle and walking commuters indicated that they had walked for 30 minutes or more to reach a destination, 28% and 19% respectively, than car or public transport users, 10% and 10.5% respectively. This indicates that these groups are more likely to be more active in their commuting activities and their daily lives.

### 8.10.6 Car ownership

Car ownership has a very substantial impact on travel mode choice. Australian Bureau of Statistics Census (2011) data indicates that Perth and Peel have high levels of car ownership and that the number of cars per household generally increases with distance from the Perth CBD.

The *Get a Move On!* Commuter Survey found that people living in households with one vehicle are 2.9 times less likely to choose to travel by car than commuters who live in a household with two vehicles or more.

People without access to a car were, as a result, public transport dependent and were most likely to be young, aged 18 to 24, and to travel by bus as their primary mode. Ten per cent of bus users surveyed as part of the *Get a Move On!* Commuter Survey did not have access to a car.

This is reflected by the fact that bus commuters surveyed were the least likely public transport users to identify their current mode as their 'ideal' commute.

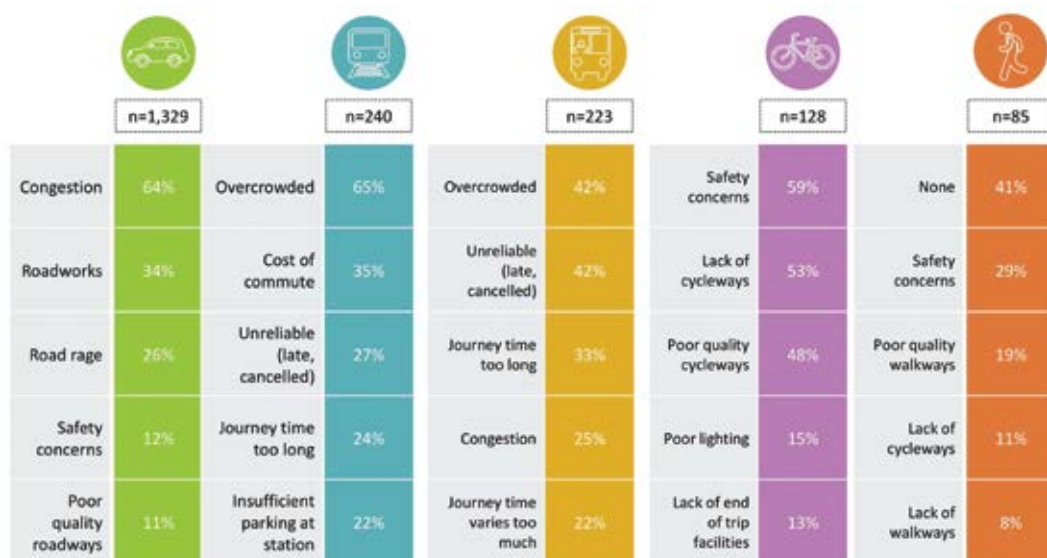


## 8.11 Commuter Frustrations

The frustrations that commuters encounter during their travel can also influence mode choice. Figure 8x below lists the major frustrations of car, public transport and active commuters.

It finds that traffic congestion is the major frustration of car commuters; overcrowding is the major frustration of train commuters; and overcrowding and reliability are the major frustrations of bus commuters. Safety and infrastructure quality are the major concerns of cyclists and walkers.

**Figure 8x: Top Five Commuter Frustrations by Mode (Source: *Get a Move On! Commuter Survey, 2015*).**



Car commuters who are highly frustrated by congestion are more likely to live in the northern and north eastern corridors (see Figure 8y). Their work locations are dispersed but primarily within a 15 kilometre radius of the Perth CBD.

Train commuters who are frustrated by overcrowding are primarily in areas served by the Butler, Mandurah and Armadale train lines (see Figure 8z). Bus commuters frustrated with overcrowding are most likely to live in outer north eastern and south eastern locations and along the Fremantle to Melville corridor (see Figure 8aa).

Train and bus commuters also express frustrations with the reliability of services, however this frustration is most pronounced among bus commuters.

Cycle and walking commuters who express frustrations with their commute are most likely to work in the Perth CBD. The major frustration of cycle and walking commuters are safety, primarily associated with traffic and a lack of dedicated cycleways or poor quality footpaths.

Figure 8y, 8z and 8aa:

## Frustration of Car, Train and Bus Commuters by Home Location

(Source: *Get a Move On! Commuter Survey, 2015*).

### Frustration of Car Commuters by Home Location – Congestion



Q6. What is the postcode of your home suburb?  
Q12. What is the main mode of transport you use to get to your [A/TOR] from SQ1?  
Q27. From the list below, what are the biggest frustrations you encounter on your daily commute? Please select as many items from the list as apply to you.  
n Car = 1,288  
Note: Showing average number of car commuters frustrated by congestion within each home postcode

### Frustration of Train Commuters by Home Location – Overcrowding



Q6. What is the postcode of your home suburb?  
Q12. What is the main mode of transport you use to get to your [A/TOR] from SQ1?  
Q28. From the list below, what are the biggest frustrations you encounter on your daily commute? Please select as many items from the list as apply to you.  
n Train = 238  
Note: Showing average number of train commuters frustrated by overcrowding within each home postcode

### Frustration of Bus Commuters by Home Location – Overcrowding



Q6. What is the postcode of your home suburb?  
Q12. What is the main mode of transport you use to get to your [A/TOR] from SQ1?  
Q28. From the list below, what are the biggest frustrations you encounter on your daily commute? Please select as many items from the list as apply to you.  
n Bus = 223  
Note: Showing average number of bus commuters frustrated by overcrowding within each home postcode

## 8.12 Summary of Key Findings

### Understanding Commuter Mode Choice in Perth and Peel

Motivators for mode choice are relatively consistent among commuters but perceptions and experiences of transport convenience, speed, proximity and cost efficiency vary significantly from person to person depending on personal and work circumstances.

The demographic and socio-economic characteristics of the commuter, as well as environmental factors, including where the commuter works and the distance between their home and work locations, have a significant impact on mode choice.

Convenience is a major motivating factor for all types of commuters but is a very strong motivator for car commuting and this is strongly associated with the flexibility of car.

For train and bus commuters, convenience is associated with avoiding inconveniences and delays associated with driving on congested routes and finding car parking at their destination.

### Speed

Speed is a crucial motivating factor for commuters and is a primary motivating factor for choosing to commute by car. Speed is also a motivator for train commuters.

Car commuters motivated by speed are more likely to work in non-CBD locations.

Car is faster than public transport for most journeys. Journeys that are most competitive with car are journeys that do not require commuters to cross the Swan River and transfer through the Perth CBD.

Direct single mode train journeys are also likely to be competitive with car.

Major employment destinations that are currently significantly slower to travel to by public transport than car are Curtin University, UWA/QEII, Osborne Park and Welshpool.

Transfers and service frequencies are a substantial barrier to public transport use.

### Cost

A significant proportion of commuters perceive car to be more cost effective than public transport, and a number of people expressly identify cost as a barrier to public transport use.

Commuters who have access to free or low cost parking perceive car to be cost effective, while commuters who pay for parking, particularly in the Perth CBD, are likely to perceive public transport to be a more cost-effective commuting option.

### Health

Personal health is the primary motivator for active commuters, cyclists and walkers, and research indicates that active commuters do obtain very significant health benefits as well as reduced stress levels.

### Destination

Destination is a primary motivator for commuting via public transport and public transport users are most likely to work in the CBD.

Characteristics exhibited by effective public transport destinations are accessibility; barriers to car use; density (employment and residential); and opportunity.

### Home Location

Car commuters are more likely to live in outer locations than inner locations, however they work in locations throughout the region.

The distance between home and work impacts on mode choice. Short commutes are significantly less likely to be undertaken by car.

Train is more popular for longer commutes, while bus, walking and cycling are favoured for shorter commutes. Bus commuters, walkers and cyclists are likely to live within approximately 11 km of the Perth CBD.

Commuters who live in a location from which their work destination is accessible within a 60-minute public transport commute are more likely to choose public transport for commuting purposes.

Bus commuters are most likely to live within 1km of a bus service that links them with their destination, with an average of one transfer during the journey.

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Living within 4-5km of a train station increases the likelihood of travelling by train, particularly if the person also works in a location that is well served by train.

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The catchment of railway stations is largest where stations are served by bus transfers and Park 'n' Ride facilities and lowest for stations without bus transfers and with few Park 'n' Ride bays.

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The public transport system is heavily reliant on bus transfers and Park 'n' Ride to enable train users to access train stations.

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Train stations on the Mandurah and Butler lines attract more boardings per day, on average than stations on the heritage lines.

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Train stations that attract large numbers of users are origin/destination stations located immediately adjacent to metropolitan, secondary or specialised activity (employment) centres. These include Fremantle, Joondalup, Cockburn and Murdoch.

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Stations immediately adjacent to residential land uses, lower order activity centres, or low-density employment land uses attract fewer users as do those with few Park 'n' Ride bays, limited bus transfers, and lower service frequency.

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#### End of Trip Facilities

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End of trip facilities are essential to enable active commuting.

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#### Gender

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Mode choice is relatively gender neutral although men are far more likely to be cycle commuters.

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Women are significantly more likely to work from home than men.

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Women are more likely to be responsible for transporting children to and from school and activities than men.

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#### Age

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Young people in the 15 to 34-year-old age cohort are more likely to be public transport users and are particularly more likely to be bus users but are also more likely to be public transport dependent and to choose car as their ideal mode.

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People aged 35 or older are less likely to travel by alternative modes but significantly more likely to choose a non-car commute as their ideal mode.

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People aged 40 or over who currently commute by public transport and active modes are far more likely to do so for health and lifestyle reasons.

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#### Income

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Public transport dependent users are more likely to be low income earners.

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Train is more popular among people who earn in excess of \$100,000 per annum than bus.

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High income earners were also more likely to identify non-car modes as their ideal travel mode than low income earners, with a strong preference for cycling and train travel.

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#### Profession

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'White collar workers' such as professional service sector workers, clerical and administration workers are more likely to travel to work by public transport than shift workers, trades workers, teachers or health workers.

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#### Lifestyle and Previous Public Transport Use

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People who have tried public transport are more likely to commute by public transport.

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People who have walked for more than 10 minutes to reach a destination within the last month are more likely to be public transport and active commuters than people who have not walked for 10 minutes or more to reach a destination.

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People living in households with one vehicle are 2.9 times less likely to choose to travel by car than commuters who live in a household with two vehicles or more.

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#### Frustrations

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Traffic congestion is the major frustration of car commuters; overcrowding is the major frustration of train commuters; and overcrowding and reliability are the major frustrations of bus commuters. Safety and infrastructure quality are the major concerns of cyclists and walkers.

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## Section 9: Commuter Behaviour, Capacity for Mode Shift and Preferences for the Future

Ms Gemma Davis and Ms Georgia Harford-Mills  
Committee for Perth and The University of Western Australia

Commuter decision making processes are complex. Research undertaken for the *Get a Move On!* project has revealed that in Perth and Peel, commuters make travel decisions, consciously and subconsciously, based on behavioural motivations that are strongly influenced by environmental and spatial factors. These include where people live and work; the travel options available to them; and the speed, cost and convenience of these options.

Currently in Perth and Peel, both behavioural preferences, combined with environmental factors predispose commuters to choose car. Responses to the *Get a Move On!* Commuter Survey indicate that for most car commuters, unless the experience and convenience of car decreases or the cost of driving to work increases, they are unlikely to be motivated to shift from driving to alternative modes voluntarily. Commuter Survey responses also indicate that, for the majority of car commuters, the perceived convenience, cost-effectiveness and benefits of public transport would need to increase, and the user effort associated with public transport would need to decrease in order to facilitate a change in travel behaviour.

This Section of the report draws on the findings of the *Get a Move On!* Commuter Survey to examine the factors that underlie mode choice and to identify the perceptions and the demographic characteristics that predispose commuters in Perth and Peel to make particular travel choices.

It aims to identify the proportion of commuters who would be willing to shift from car to alternative modes and the characteristics of these commuters, as well as the characteristics and motivations of commuters who already travel by public transport or active modes. It also provides an overview of the strategies that commuters support to improve the region's transport future. This shows that, despite the dominance of car use in the region, there is almost unanimous support for the government to invest in a public transport oriented future.



## 9.1 Behavioural Factors Influencing Travel Behaviour in Perth and Peel

Dr Pascal Bourgeat, Director of Behavioural Science at Ipsos conducted an analysis of the *Get a Move On!* Commuter Survey results. He identified behavioural factors influencing individual mode choice for the *Get a Move On!* project, which are outlined below, along with their relevance within the context of Perth.

This analysis indicates that shifting people from their existing mode choice, which in Perth is primarily car, to an alternative mode is difficult. It would require strong motivating factors and need to include both costs associated with their existing behaviour and benefits associated with change.

### 9.1.1 Behavioural influence 1: People seek to maximise

People seek to maximise, that is, they intend, consciously or unconsciously, to make decisions they're happy with and try to avoid bad decisions and bad outcomes. Decision-making is impacted by both reflective and reflexive processes. In transport, reflective processes include taking into account information such as perceived or objective costs which include monetary costs like fares, car costs and parking fees and time costs - the time it takes to walk to the station and/or time sitting in the car or train (Bourgeat, 2016).



#### Seeking to Maximise - Perth Context

In Perth, travel by car is faster. For many common journeys to work it is more than 100% faster than public transport.

As a result, when seeking to maximise, most commuters in Perth choose car. This is heightened by the convenience of car because it takes commuters door to door when it suits them. Cost is also a factor considered by car commuters, 26% of car commuters choose to commute by car because they perceive it to be cost effective.



The cost of parking at the destination does, however, influence decisions to travel by car. Non-car commuters are less than half as likely to have access to free parking at work than car commuters.

### 9.1.2 Behavioural influence 2: Retaining the status quo

Status quo bias or habit pushes people to avoid making changes to their travel choices and ignore or not follow-up on new information affecting the relative appeal of public transport versus car commuting (confirmation bias). Inertia often comes from insufficient motivation, and it is easy to over-estimate how driven individuals are to change, or the expected impact of our interventions, and to underestimate the need to apply as many forces as available onto motivation (Bourgeat, 2016).



#### Retaining the Status Quo - Perth Context

In Greater Perth, a majority (69%) of commuters travel to work by car – meaning that for the majority, car is the status quo (ABS, 2011). Car remains the most efficient mode of transport to the majority of destinations; and 69% of car commuters are also satisfied with their current commute.

This, combined with the perceived speed, convenience and flexibility of car, results in low motivation for mode shift among the majority. Twelve per cent (12%) of car commuters surveyed as part of the *Get a Move On!* Commuter Survey express dissatisfaction with their car commute and may be motivated to change, if they have access to a viable alternative.



### 9.1.3 Behavioural influence 3: Social influences

Social influences also play a specific role in maintaining the dominance of car for the vast majority of commuters. As long as the social/cultural norm is that people around us commute by car and not public transport, there is little social incentive to consider public transport. Placing barriers against driving to key locations and events provides an opportunity to initiate public transport use among many residents and could assist to impact the long-established social/cultural norm in Perth. New developments or events that limit access by car or encourage public transport use can provide a disruptive element conducive to changing behaviour (Bourgeat, 2016).



#### Social Influences - Perth Context

Car is the social norm in Perth and Peel. Sixty-nine per cent (69%) of commuters travel to work by car in Greater Perth and approximately 95% of commuters travel by car to non-CBD destinations (ABS, 2011). The *Get a Move On!* Commuter Survey and Business Interviews found that public transport use is perceived by some to have social stigma and can be associated with lower income earners. There is a view among some middle and high income earners that public transport is not for them. The *Get a Move On!* Commuter Survey results indicate that bus is most likely to be perceived negatively by all commuters and train is more likely to be preferred by high income earners.

CBD commuters are less likely to report stigma associated with public transport, with train being their preferred mode, and people are most likely to use public transport for journeys to the CBD.

People in Perth and Peel are also more likely to travel by public transport if they have tried public transport within the past 12 months. For example, commuters are 5.1 times less likely to commute by car if they have used a train in the last 12 months and 3.6 times less likely to commute by car if they have used a bus within the past 12 months. This suggests that trying public transport can 'disrupt' current patterns of travel behaviour and facilitate a mode shift.



### 9.1.4 Behavioural influence 4: People avoid negative emotion

People avoid negative emotion. Commuters will consciously and subconsciously aim to avoid negative emotion associated with their commute. Negative emotions can be associated with all types of commuting – albeit for different reasons.



#### Avoiding Negativity - Perth Context

In Perth and Peel, about the same proportion of car commuters (54%) and train commuters (49%) express negative experiences, "stress" or "extreme stress", associated with their transport mode choice. This creates a balance between the two modes and makes it difficult to pull car commuters eager to avoid the emotional outcomes of car commuting towards a different mode. It is also noted that 32% of car commuters also perceive car to be a less stressful mode of travel.

Negative emotion associated with car travel is most commonly raised by traffic congestion (64%); roadworks (34%); and road rage (26%); while negative emotion associated with public transport is because of overcrowding (54%); late services (34%); and time taken to complete a journey (28%).



### 9.1.5 Behavioural influence 5: People minimise effort

People minimise effort. Physical effort is a barrier to changing commuter behaviour, that is how far you need to walk to a bus stop or a train station; how far to walk in the carpark to the station; and the distance from the station or stop to work at the destination.

Cognitive costs also foster status quo behaviours and inhibit change towards public transport and active modes. Travelling by public transport starts with a 'cost', which is to walk/cycle/drive to a bus stop or a train station. The longer the time to a bus stop or train station, the less attractive the public transport mode becomes. One way of decreasing this cost is to reframe the upfront travel, walking to bus stop or train station, as a benefit rather than a cost. Given the impact that commuting has on sedentary time, health and exercise is an avenue to reframe upfront public transport costs. The behaviour change issue is broader than one of travel mode choice.

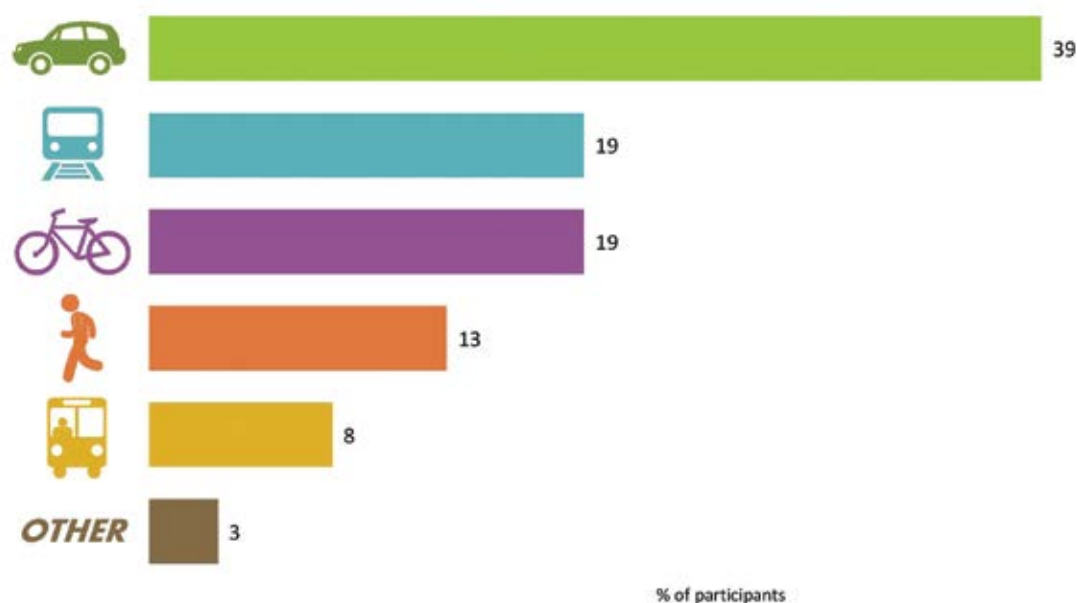
#### Minimise Effort - Perth Context

Travel time and effort were commonly stated reasons for commuters in Perth and Peel to choose car or not shifting to their 'ideal' mode. Commuters commonly state laziness, lack of fitness, or needing to 'get out of bed earlier' as barriers to walking, cycling and public transport use. However, people who do make the effort to use these modes, active modes in particular, express very high levels of satisfaction, enjoyment and reduced stress. There may therefore be capacity to encourage people to try alternative modes by promoting these benefits.

## 9.2 What is the Potential for Car Commuters in Perth and Peel to Shift Mode?

The *Get a Move On!* Commuter Survey asked respondents to identify the commute mode that they would choose in an 'ideal world'. Overall, 61% of commuters prefer alternative modes (other than car) in an ideal world, with particularly strong preferences for train and cycling.

Figure 9a: Preferred Transport Mode (Source: *Get a Move On!* Commuter Survey, 2015).



For the purpose of this study, car commuters have been categorised into four key types and eight sub-types based on:

- Stated mode preferences in an 'ideal world' (Q19);
- Stated satisfaction associated with existing commute (SQ13);
- Responsibility for transporting children to school; (D7)
- Requirement to use car at work/study (Q24/7) and
- Stated reasons for not commuting by preferred mode (Q21).

A summary of each category and the proportion and types of commuters who fall under each categorisation is outlined in Table 9a and Table 9b. The key findings of this characterisation are outlined below.

### **9.2.1 Car commuter characterisation: Capacity for mode shift**

In regard to the existing motivation of commuters for mode shift, the *Get a Move On!* Commuter Survey results indicate that:

- 74% of car commuters are currently unlikely to shift modes voluntarily because they either have a strong preference for car commuting or express satisfaction with their existing car commute, meaning that they find their car commute is satisfactory and they have no motivation to change.
- 48% of commuters have a strong personal/cultural preference for car and are likely to continue to maintain a preference for car.
- 36% of car commuters express a preference for alternative modes but are satisfied with their current car commute and have no motivation to change.
- 25% of car commuters express a preference for alternative modes, are not satisfied/or express neutral satisfaction with their current car commute and have some motivation for mode shift.
- 12% of car commuters are dissatisfied with their car commute and express a preference for alternative modes but do not currently perceive these modes to be a viable (better) alternative.
- 8% of commuters are dissatisfied with car commuting and also have personal/family circumstances that would enable a mode shift. These commuters may shift mode voluntarily if conditions are appropriate, if public transport, cycling or walking access from home to work improved.
- Dissatisfied car commuters are primarily white collar workers (76%) with the greatest densities of dissatisfied commuters working in CBD and central locations.

**Dissatisfied car commuters are primarily white collar workers**

**Table 9a: Car Commuter Characterisations**

(Source: *Get a Move On! Commuter Survey, 2015*).

Commuter Type	Sub-Categories	Capacity for Voluntary Mode Shift Given Appropriate Conditions
<b>Persistent Car Commuters (38%)</b> Satisfied with car commute and would continue to drive in an ideal world, or dissatisfied but would not consider mode shift <sup>6</sup> .	<b>Persistent –Circumstantial (11%)<sup>7</sup></b> State that they will continue to drive because their work or personal circumstances require them to drive.	<b>Very Low:</b> Potential for voluntary mode shift is low and among a portion of persistent circumstantial commuters' capacity for mode shift is nil.
	<b>Persistent – Dependent/Preferential (28%)<sup>8</sup></b> State that they will continue to drive because public transport access is poor; because they enjoy driving; or because or have a bias against public transport or active modes.	<b>Very Low:</b> Unlikely to shift modes unless unable to drive/unable to afford to drive.
<b>Satisfied – Idealistic Car Commuters<sup>9</sup> (36%)</b> Satisfied with car commuting but state a preference to shift in an ideal world. A significant proportion of these commuters state ideal preferences that are idealistic and are unlikely to translate into mode shift in reality.	<b>Satisfied Circumstantial (17%)</b> Express preference for public transport or active modes but are generally satisfied with car commute. Work/personal circumstances, such as family responsibilities, would limit/are perceived to limit potential for mode shift.	<b>Low:</b> Potential for voluntary mode shift low given satisfaction with current car commute. Mode shift likely to require change in personal circumstances; improved accessibility via preferred mode; and barriers to car commute.
	<b>Satisfied Dependent (19%)</b> Express preference for public transport or active modes but are generally satisfied with car commute. Accessibility/time/inconvenience/poor infrastructure stated as primary factors limiting mode shift.	<b>Low:</b> Potential for voluntary mode shift is low given satisfaction with current car commute. Mode shift likely to require substantial improvements to public transport services/infrastructure to/from home and work location.
<b>Neutral Car Commuters (11%)</b> Neutral satisfaction with car commuting and state a preference to shift in an ideal world <sup>10</sup> .	<b>Neutral Circumstantial (3%)</b> Express preference for public transport or active modes; neutral level of satisfaction with current commute; identify work, personal or family circumstances as primary factors limiting mode shift.	<b>Low-Moderate:</b> Neutral satisfaction with current commute increases potential for mode shift however enabling mode shift would require change in personal, home or work circumstances.
	<b>Neutral – Dependent (4%)</b> Majority express preference for public transport or active modes; neutral level of satisfaction with current commute; identify accessibility/time/inconvenience/poor infrastructure as primary factors limiting mode shift.	<b>Moderate:</b> These commuters have moderate potential for mode shift however they require substantial improvements to public transport services/infrastructure to/from home and work location.
	<b>Reluctant Circumstantial (6%)</b> Not satisfied with drive to work but work/personal circumstances limit potential for mode shift.	<b>Moderate:</b> These commuters have moderate capacity for mode shift given dissatisfaction with car commute however would require change in personal/work circumstances to enable mode shift.
<b>Reluctant Car Commuters<sup>11</sup> (14%)</b> Not satisfied with current drive to work but continue to drive due to personal preferences lack of fast, convenient access via alternative modes or due to personal/ work circumstances.	<b>Reluctant Dependent (8%)</b> Not satisfied with driving to work and identify accessibility/time/inconvenience/poor infrastructure as primary factors limiting mode shift.	<b>Moderate – High:</b> These commuters have moderate to high capacity for mode shift if there were substantial improvements to public transport services/infrastructure to/from home and work location.

<sup>6</sup> Filtered by Q 19: Mode preference in and ideal world and Q13 satisfaction (all responses)

<sup>7</sup> Filtered by QD7; Q24/7; Q21: responsible for transporting children/needing car at work/stated reasons for choosing to drive. These questions were used to determine all 'circumstantial' car drivers.

<sup>8</sup> Filtered by Q21, stated reasons for driving to work and Q24 'no other viable option'. These filters were applied to identify all dependent car users.

<sup>9</sup> Filtered by Q 19: Mode preference in and ideal world (Q19) and Q13 satisfaction (rated 6-10)

<sup>10</sup> Filtered by Q 19: Mode preference in and ideal world (Q19) and Q13 satisfaction (rated 5)

<sup>11</sup> Filtered by Q 19: Mode preference in and ideal world (Q19) and Q13 satisfaction (rated 1-4)



**Table 9b: Car Commuter Characterisations, Demographic Impacts**

(Source: *Get a Move On! Commuter Survey, 2015*).

Persistent and Satisfied Car Commuters - Demographic Characteristics	Examples of Car Commuter Comments Regarding Current Mode Choice (by commuter type)
<b>Demographic characteristics of persistent car commuters:</b>  72% aged 35 and over 63% earn \$100,000 or more 47% white collar workers 20% responsible for transporting children to school/activities 14% work in 600x postcodes 0.5% work in 6000 postcode 7% live in 600x or 6100/6101 postcode 94% have access to free parking at work Ideal modes: Car; train and cycle	<b>Persistent Circumstantial</b>  "I work in sales and need my car for work" "I am a construction worker and I need my car to transport tools" "My health prevents me from using public transport" <hr/> <b>Persistent Preferential/Dependent</b>  "I enjoy driving" "Easy – no stress" "I can sing out loud in my car" "I am in control of the route I take. I can listen to radio. I am comfortable in my car. I can smoke in my car" "I hate public transport" "I hate sitting next to strangers" <hr/> <b>Satisfied Circumstantial</b>  "Have a child to drop off/pick up before and after work" "Need my car to run errands" "I am too unfit to cycle" "I don't have a bike" "Too far for me to walk in reality" <hr/> <b>Satisfied Dependent</b>  "Train takes too long" "If public transport was as good as it is in cities overseas, I would use it" "Train doesn't go near my work" "Have to travel into the city, change and then travel out again" "Danger of traffic/I don't feel safe cycling on roads" "No cycle paths" "I don't have end of trip facilities at work"
<b>Neutral</b>  88% aged 35 or over 46% earn over \$100,000 75% professional/clerical/managers 38% responsible for transporting children 16% work in CBD (6000 postcode) 38% work in a central location (600x; 6101; 6100 postcode) 2% live in a 600x; 6100 or 6101 postcode 70% have access to free parking at work Ideal modes: Train; cycle	<b>Neutral Circumstantial:</b>  "Responsible for transporting children" "I sometimes need to work late and public transport is inconvenient after hours" "I like to have freedom after work" "Too far to walk" <hr/> <b>Neutral Dependent:</b>  "No direct route" "Too many transfers" "Public transport is very slow and I have free parking at work" "Bus is too unreliable!"
<b>Dissatisfied</b>  95% aged over 35 49% earn in excess of \$100,000 76% white collar workers 41% responsible for transporting children to school/activities 11% work in 6000 postcode 37% work in 600x and 6100 or 6101 postcode 3% live in a 600x; 6100 or 6101 postcode 67% have access to free parking at work Ideal modes: Train	<b>Dissatisfied Circumstantial:</b>  "I need to use my car to run errands at work" "I have a company car" "I work part- time and public transport takes too long – my work day would be half over by the time I arrived!" <hr/> <b>Dissatisfied Dependent:</b>  "I hate driving but I don't have any real alternative" "There is no good public transport service near my home" "Public transport takes way too long to my work. If it was better, I would use it." "I need to drive to the station then catch a train then walk then change to bus. It takes too long and if I miss a connection it adds another 15 minutes to my journey"

Figure 9b and Figure 9c:

Satisfaction with Car Commute by Home and Work Location

(Source: *Get a Move On! Commuter Survey, 2015*).

Satisfaction with Car by Home Location



SQ6. What is the postcode of your home suburb?  
 SQ12. What is the main mode of transport you use to get to your [AUFILL from SQ3]?  
 SQ13. And taking everything into consideration, how satisfied are you with your current commute?  
 n Car = 1,268  
 Note: Showing average scores of satisfaction within each home postcode, rated on a scale from 0 = Not at all satisfied to 10 = Extremely satisfied

Satisfaction with Car by Work Location



SQ6. What postcode is your job/industry [AUFILL from SQ3] located in?  
 SQ12. What is the main mode of transport you use to get to your [AUFILL from SQ3]?  
 SQ13. And taking everything into consideration, how satisfied are you with your current commute?  
 n Car = 1,262  
 Note: Showing average scores of satisfaction within each work postcode, rated on a scale from 0 = Not at all satisfied to 10 = Extremely satisfied

**"I am a construction worker and I need my car to transport tools"**

### 9.2.2 Car commuter characterisation: Characteristics which influence capacity for mode shift

An analysis of some of the characteristics and stated circumstances of car commuters have found that:

- Commuters who work in non- CBD middle and outer locations are more likely to be satisfied with driving and less likely to express a preference for an alternative mode.
- Car commuters who are dissatisfied with car commuting work in inner non- CBD locations and live in dispersed/outer locations.
- White collar workers are more likely to express a preference for mode shift from car than sales workers or trade/construction workers.
- Young people, aged 24 to 34, are more likely to express a preference for car than commuters aged over 35 years.
- 26% of car commuters who express a preference for an alternative mode are limited in their capacity for mode shift due to personal or work circumstances and requirements. Responsibility for transporting children to school/activities is a key family responsibility that is perceived to limit potential for mode shift.
- 94% of satisfied and persistent car commuters have access to free parking at work compared to approximately 70% of neutral and reluctant car commuters.
- Train and cycle are the most commonly identified preferred alternative modes.

### 9.2.3 Bus and train commuters: Capacity for retention

At the time of the 2011 Census, approximately 10.6% of commuters in Greater Perth travelled to work by public transport (ABS, 2011). The *Get a Move On!* Commuter Survey identified the primary motivators of bus and train commuters as cost efficiency (62%), followed by convenience (52%), accessibility of public transport (51%), and speed (36%).

Like car commuters, there are a number of significant factors which underlie the motivations of public transport commuters and these factors also influence the potential for existing users to remain public transport commuters in the future or to shift to car.

In regard to the existing motivation of commuters to stay users of public transport, the *Get a Move On!* Commuter Survey results indicate that:

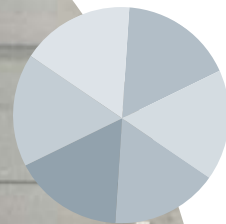
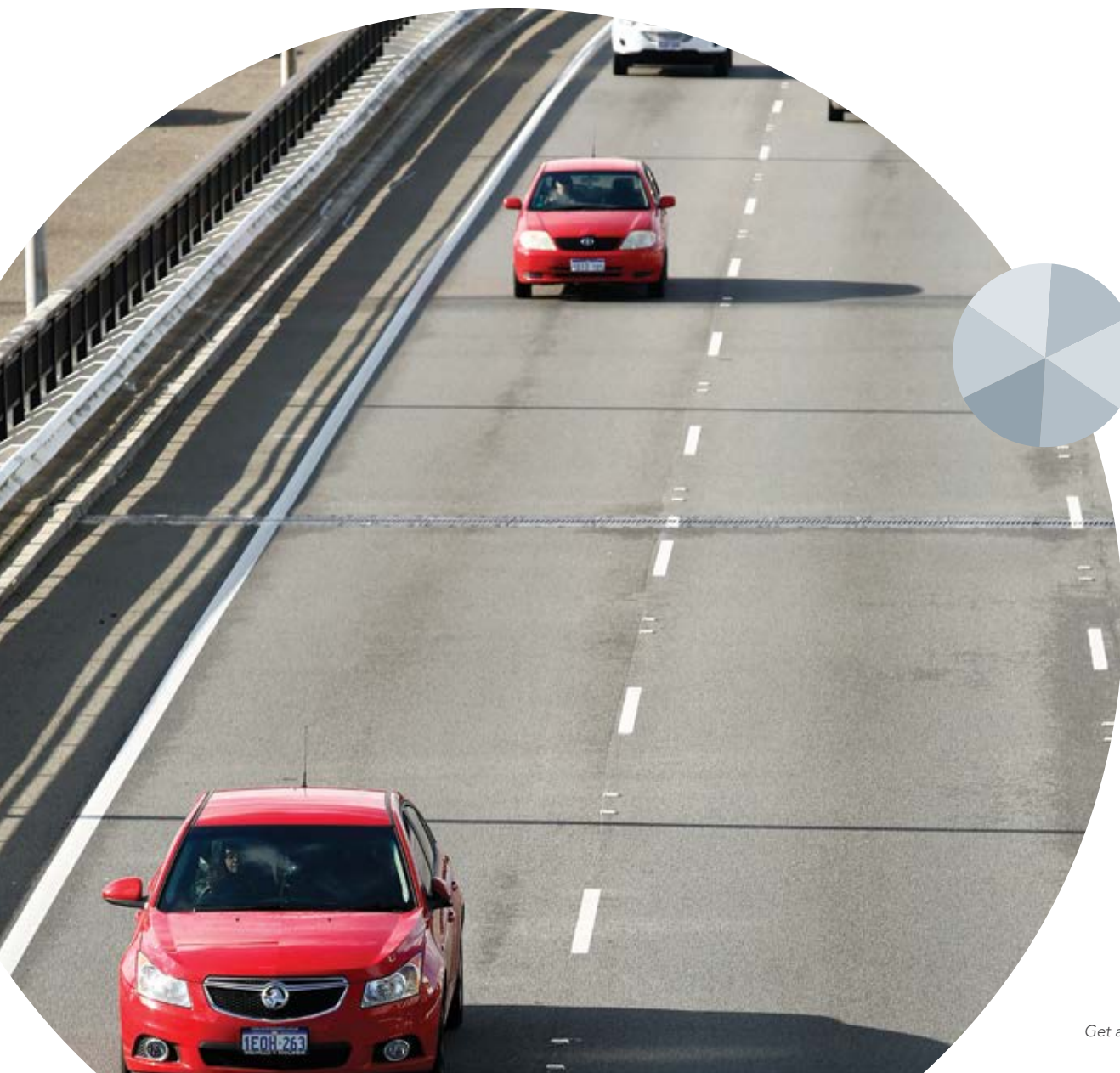
- 26% of all commuters surveyed identified train or bus as their ideal mode of commute.
- 41% of all public transport commuters expressed a desire to continue to use public transport to commute.
- 69% of public transport commuters expressed satisfaction with their current mode of commute.
- 43% of satisfied public transport users expressed a desire to continue to use public transport to commute to work or study in an 'ideal world' and 24% expressed a desire to commute by car.
- A slightly higher proportion of train users expressed satisfaction with their current commute (71%), compared with bus users (67%).
- 29% of existing bus and train commuters expressed a preference for car as their ideal mode of commuter transport. Despite this, 57% of these commuters are satisfied with their existing public transport journey.
- Train users expressed a slightly higher preference for public transport in an ideal world (43%) compared with bus users (39%). They also expressed a lower preference for car use in an ideal world (28%) compared with bus users (31%).



### 9.3 Bus and Train User Categorisation

This section characterises public transport (bus and train) commuters into three key categories in order to obtain an increased understanding of the motivations of current bus and train users and their capacity to continue to use public transport in the future.

1. **Committed discretionary public transport users** are most likely to choose public transport due to lifestyle, convenience or personal preference. These commuters also choose public transport in an ideal world, whether satisfied or dissatisfied with their existing commute.
2. **Circumstantial public transport users** choose to commute by public transport because factors such as traffic congestion or parking costs/limited parking at their destination. Their use is discretionary but is strongly linked to the cost and barriers to driving. These commuters do not all identify public transport as their ideal mode.
3. **Dependent public transport users** travel to work via public transport because they do not have access to a car, do not have a drivers' licence, or cannot afford to drive and park.





**Table 9c: Bus and Train User Categorisation**

(Source: *Get a Move On! Commuter Survey, 2015*).

Commuter Type	Sub-Categories	Capacity for Voluntary Mode Shift Given Appropriate Conditions
<b>Committed public transport users (33%)</b> Choose public transport due to lifestyle, convenience or personal preference. These commuters are current public transport users and also choose public transport as their preferred mode in an ideal world <sup>12</sup> .	<b>Committed – Preferential (17%)</b> State that they will continue to use public transport because they gain personal benefits by doing so, including enjoyment; time; environmental; reduced stress. Commuter type: 66% train users and 34% bus users.	<b>Very Low:</b> Potential for voluntary mode shift is low and among a portion of persistent circumstantial commuters' capacity for mode shift is nil.
	<b>Committed – Dissatisfied (8%)</b> State that they will continue to use public transport generally due to a number of barriers to driving including cost and convenience. Frustrations with public transport arise from speed and overcrowding.	<b>Low - Moderate:</b> Likely to shift modes if circumstances change that allow them to not use public transport.
<b>Circumstantial public transport users (51%)</b> Choose to commute by public transport because of factors such as traffic congestion or parking costs/ limited parking at their destination. Their use is discretionary but is strongly linked to the cost and barriers to driving. These commuters are less likely than 'committed' users to identify public transport as their ideal mode <sup>13</sup> .	<b>Circumstantial - Preferential (32%)</b> Express preference for public transport or active modes but are generally satisfied with car commute. Work/personal circumstances, such as family responsibilities, would limit/ are perceived to limit potential for mode shift.	<b>Low:</b> Potential for voluntary mode shift low given satisfaction with current car commute. Mode shift likely to require change in personal circumstances; improved accessibility via preferred mode; and barriers to car commute.
	<b>Circumstantial - Dissatisfied (21%)</b> Choose to commute by public transport and identify dissatisfaction with their current mode choice. Just under half choose car as their ideal mode of transport, however barriers such as cost and unavailability of parking limit their ability to do so.	<b>Low:</b> Potential for voluntary mode shift is low given satisfaction with current car commute.  Mode shift likely to require substantial improvements to public transport services/ infrastructure to/from home and work location.
<b>Dependent Public Transport Users (15%)</b> Travel to work via public transport because they do not have access to a car, do not have a drivers' licence, or cannot afford to drive and park <sup>14</sup> .	<b>Dependent -Preferential (6%)</b> Express preference for public transport, despite being dependent on it to get to work/ study; about half are satisfied with their current mode choice.	<b>High:</b> Neutral satisfaction with current commute increases potential for mode shift, however respondents express a preference to use public transport. High likely to retain these users, especially if service levels increase.
	<b>Dependent - Dissatisfied (6%)</b> Express dissatisfaction with current mode of commute; identify lack of licence and car ownership as the main motivators behind mode choice. Almost all choose car as ideal transport mode.	<b>Moderate:</b> These commuters have moderate potential for mode retention, as current circumstances limit their ability to change modes however if circumstances change they are likely to shift to car.

<sup>12</sup> Filtered by Q25 responses: I enjoy it; it's convenient; it's environmentally friendly; it's faster than other options; and less stressful than other options.

<sup>13</sup> Filtered by Q25 responses: I can avoid the hassle of car parking; I live or work close to public transport; it's cost efficient; my employer or student status gives me access to cheaper public transport; and public transport arrives closer to my destination.

<sup>14</sup> Filtered by Q25 responses: I don't have access to a car; I have no other viable option; and my health or mobility prevents me using another mode of transport.



An overview of the proportion of public transport commuters who fall into each of these categories and their demographic characteristics is outlined in Table 9d.

**Table 9d: Bus and Train Commuter Characterisations, Demographic Characteristics**  
(Source: Get a Move On! Commuter Survey, 2015).

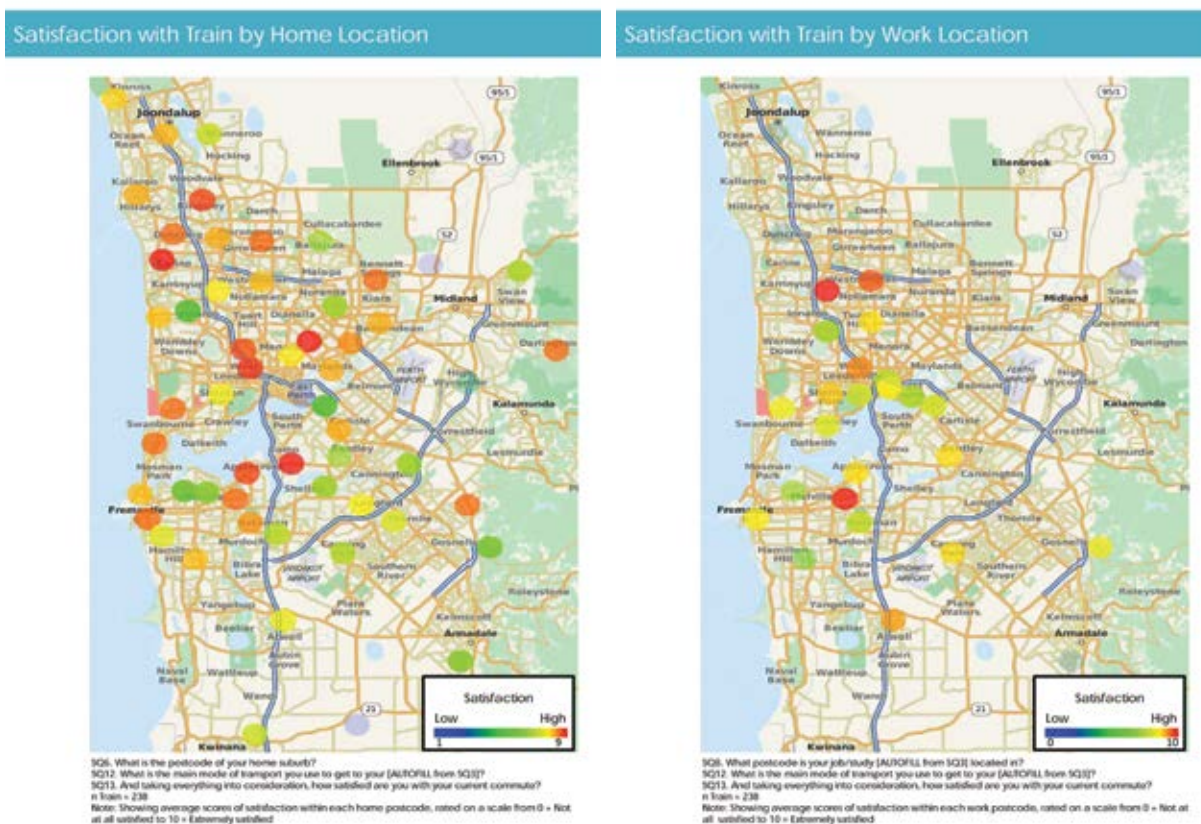
Commuter Type	Sub-Categories	Capacity for Voluntary Mode Shift Given Appropriate Conditions
<b>Committed public transport users (33%)</b> Choose public transport due to lifestyle, convenience or personal preference. These public transport commuters identify public transport as their ideal mode whether satisfied or dissatisfied with their current public transport commute <sup>15</sup> . 20% dissatisfied with current mode 7% neutral with current mode 73% satisfied with current mode	<b>Committed public transport users</b> 63% aged 35 and over 50% earn \$100,000 or more 78% professional/clerical/managers 25% responsible for transporting children 61% work in CBD (6000 postcode) 82% work in a central location (600x; 6101; 6100 postcode) 8% live in a central location (600x; 6101; 6100 postcode) 20% have access to free parking at destination Ideal modes: train (38%); bus (14%); active transport (27%); car (19%)	<b>Committed public transport users</b> "Clean and green, and I can read on the train" "It's reliable and close to my house" "Can chill out. Not risking life and limb as I would on a bike." "It is relaxing and means that I don't have to drive. It also means that I need to do some walking which I enjoy doing"
<b>Circumstantial public transport users (51%)</b> Choose to commute by public transport because factors such as traffic congestion or parking costs/limited parking at their destination. Their use is discretionary but is strongly linked to the cost and barriers to driving. These commuters are less likely than 'committed' users to identify public transport as their ideal mode <sup>16</sup> . 15% dissatisfied with current mode 12% neutral with current mode 73% satisfied with current mode	<b>Circumstantial - Preferential (32%)</b> 4% aged 35 and over 36% earn \$100,000 or more 72% professional/clerical/managers 17% responsible for transporting children 51% work in CBD (6000 postcode) 78% work in a central location (600x; 6101; 6100 postcode) 18% live in a central location (600x; 6101; 6100 postcode) 15% have access to free parking at destination Ideal modes: train (24%); bus (12%) active transport (27%); car (31%)	<b>Circumstantial public transport users</b> "I can't afford to pay for parking" "Quicker than driving, don't have to drive on the freeway through peak hour" "Because the car bay is a shared bay and is not always available" "Reducing cost of running an extra household car"
<b>Dependent Public Transport Users (15%)</b> Travel to work via public transport because they do not have access to a car, do not have a drivers' license, or cannot afford to drive and park <sup>17</sup> . 39% dissatisfied with current mode 13% neutral with current mode 48% satisfied with current mode	<b>Dependent Public Transport Users</b> 53% aged 35 and over 29% earn \$100,000 or more 52% professional/clerical/managers 10% responsible for transporting children 32% work in CBD (6000 postcode) 59% work in a central location (600x; 6101; 6100 postcode) 13% live in a central location 39% have access to free parking at work/study Ideal modes: train (21%); bus (17%); active transport (14%); car (42%)	<b>Dependent Public Transport Users</b> "Only have learners permit" "Don't have my own car" "We only have one car in the family and my wife uses it during the day" "Never held a drivers licence" "Traffic is bad when driving to the city and parking is limited"

<sup>15</sup> Filtered by Q25 responses: I enjoy it; it's convenient; it's environmentally friendly; it's faster than other options; and less stressful than other options.

<sup>16</sup> Filtered by Q25 responses: I can avoid the hassle of car parking; I live or work close to public transport; it's cost efficient; my employer or student status gives me access to cheaper public transport; and public transport arrives closer to my destination.

<sup>17</sup> Filtered by Q25 responses: I don't have access to a car; I have no other viable option; and my health or mobility prevents me using another mode of transport.

Figure 9d and Figure 9e: Satisfaction with Train by Home and Work Location  
(Source: Get a Move On! Commuter Survey, 2015).



### 9.3.1 Public transport commuter characterisation: Characteristics which influence capacity for retention

An analysis of some of the characteristics and stated circumstances of public transport commuters have found that:

- Public transport commuters who work in a CBD postcode location are more likely to be satisfied with commuting via public transport. They are equally as likely as non- CBD middle and outer location commuters to choose public transport as their mode choice in an 'ideal world'.
- Over half of public transport commuters who are dissatisfied with their commute, work in a non-CBD location (61%).
- Train users who work in outer CBD locations such as West Perth and East Perth are less likely to be satisfied with their commute.
- Commuters who live in a non- central location and work in a central location are more likely to be committed or circumstantial public transport users.
- Commuters who have limited access to parking at work are less likely to choose car as their ideal mode.
- Female public transport users are more likely to express a preference for mode shift to car than males.
- Young people, aged 18- 24 years, are more likely to be dependent public transport users.

## 9.4 Cycle and Walk Commuter Categorisation

The *Get a Move On!* Commuter Survey identified cycle and walk commuters as the most satisfied respondents, who were also the least likely to identify that they have a preference for mode shift. This section examines the demographic characteristics of these commuters in order to understand various factors that enable an active mode of commute.

In regard to the existing motivation of commuters to stay users of active transport, the *Get a Move On!* Commuter survey results indicate that:

- 32% of all commuters surveyed identified cycling or walking as their ideal mode of commute.
- 88% of cycle and walk commuters expressed a desire to continue to use an active mode for their commute.
- 90% of active commuters are satisfied with their current commute.
- 7% of active commuters identified their preferred mode of transport in an ideal mode as car, however 79% of these commuters still expressed satisfaction with their current commute.
- 2% of active commuters expressed neutral or dissatisfaction with their current mode of commute and also a preference to shift to an alternative mode, either car or public transport.
- Walkers were slightly more satisfied with their current commute (94%) compared to cyclists (88%), however they were less likely to express a preference for an active mode of commute in an 'ideal world', with 78% of walkers preferring an active commute compared with 95% of cyclists.
- Active commuters lived in varied locations, with 34% located centrally in a CBD or central location. The work location of active commuters was more centralised, with 65% working in a CBD or central location.

An overview of the proportion of active transport commuters who fall into each of these categories and their demographic characteristics is outlined in Table 9e.



**Table 9e. Active Commuter Characterisations, Demographic Characteristics**

(Source: *Get a Move On! Commuter Survey, 2015*).

Commuter Type	Demographic characteristics	Examples of Cycle / Walk Commuter Comments Regarding Current Mode Choice
<p><b>Committed active transport users (88%)</b> Choose active transport due to lifestyle, convenience or personal preference. These commuters identify active transport as their ideal mode whether satisfied or dissatisfied with their current public transport commute<sup>18</sup>. 5% dissatisfied with current mode 4% neutral with current mode 91% satisfied with current mode</p>	<p><b>Committed active transport users</b> 66% aged 35 and over 49% earn \$100,000 or more 82% professional/clerical/managers 16% responsible for transporting children 34% work in CBD (6000 postcode) 65% work in a central location (600x; 6101; 6100 postcode) 33% live in a central location (600x; 6101; 6100 postcode) 44% have access to free parking at destination</p>	<p><b>Committed active transport users</b> "I like to be outside and move, it keeps me fit and well" "It's free, environmentally friendly, fights off chronic disease and keeps me mentally and physically fit. Everyone should be doing it" "I do not travel a large distance to work and can save money on fuel and rego on a second family car, also good for health and fitness" "It is just a nice way to go to work"</p>
<p><b>Circumstantial active transport users (11%)</b> Choose to commute by active transport because factors linked to cost. These commuters are less likely than 'committed' users to identify active transport as their ideal mode<sup>19</sup>. 8% dissatisfied with current mode 8% neutral with current mode 83% satisfied with current mode</p>	<p><b>Circumstantial active transport users</b> Sample size is too small to gain significant meaning from demographic analysis.</p>	<p><b>Circumstantial active transport users</b> "It's cheaper and takes less time" "Parking is ridiculously expensive, and with traffic it is quicker to cycle" "The expense of paid parking is too high" "It is quicker to get home in the afternoon than by car, it is free and it gets my exercise quota"</p>
<p><b>Dependent Active Transport Users (2%)</b> Travel to work via active transport because they do not have an alternative viable option<sup>20</sup>. 0% dissatisfied with current mode 20% neutral with current mode 80% satisfied with current mode</p>	<p><b>Dependent Active Transport Users</b> Sample size is too small to gain significant meaning from demographic analysis.</p>	<p><b>Dependent Active Transport Users</b> "No parking" "Because I live very close to my place of study. However, my next preference would be driving or getting the bus"</p>

<sup>18</sup> Filtered by Q19 responses: cycle; walk.

<sup>19</sup> Filtered by Q25 response: it's cost efficient.

<sup>20</sup> Filtered by Q25 response: I have no other viable option.



Figure 9f and Figure 9g:  
 Satisfaction with Cycle Commute by Home and Work Location  
 (Source: *Get a Move On! Commuter Survey, 2015*).

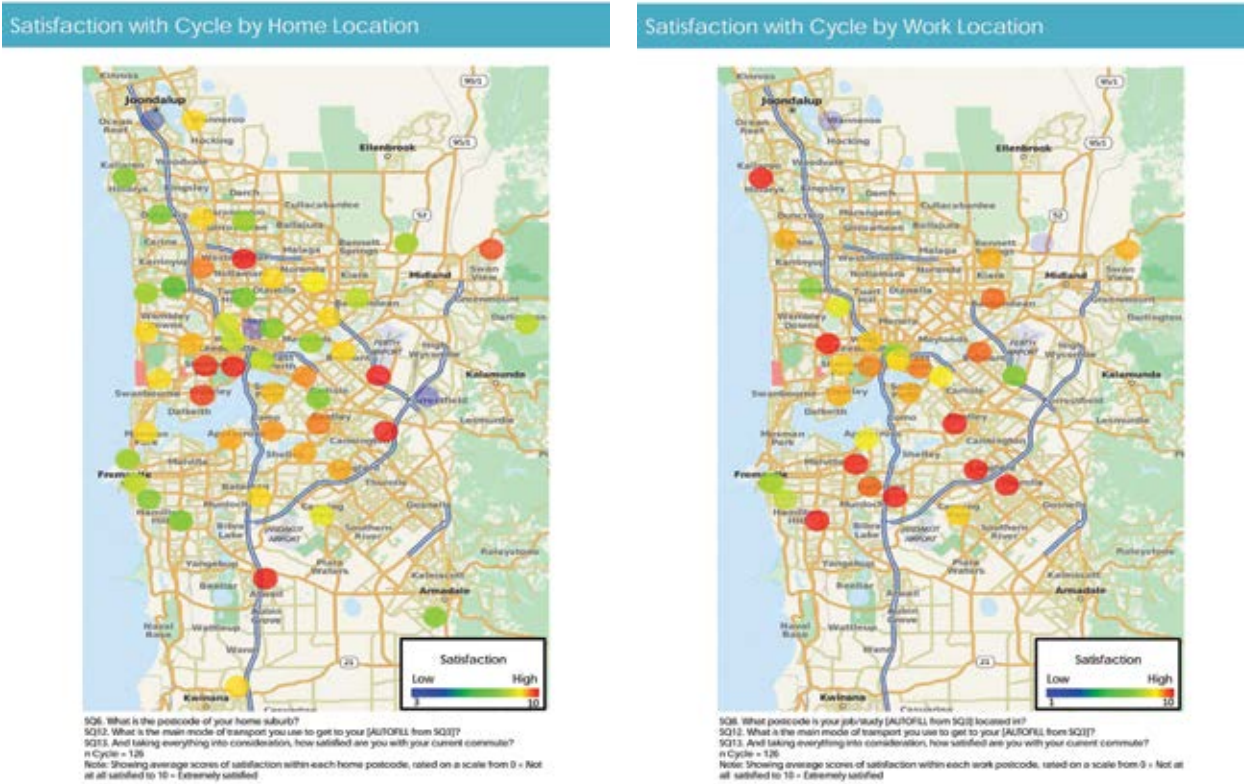
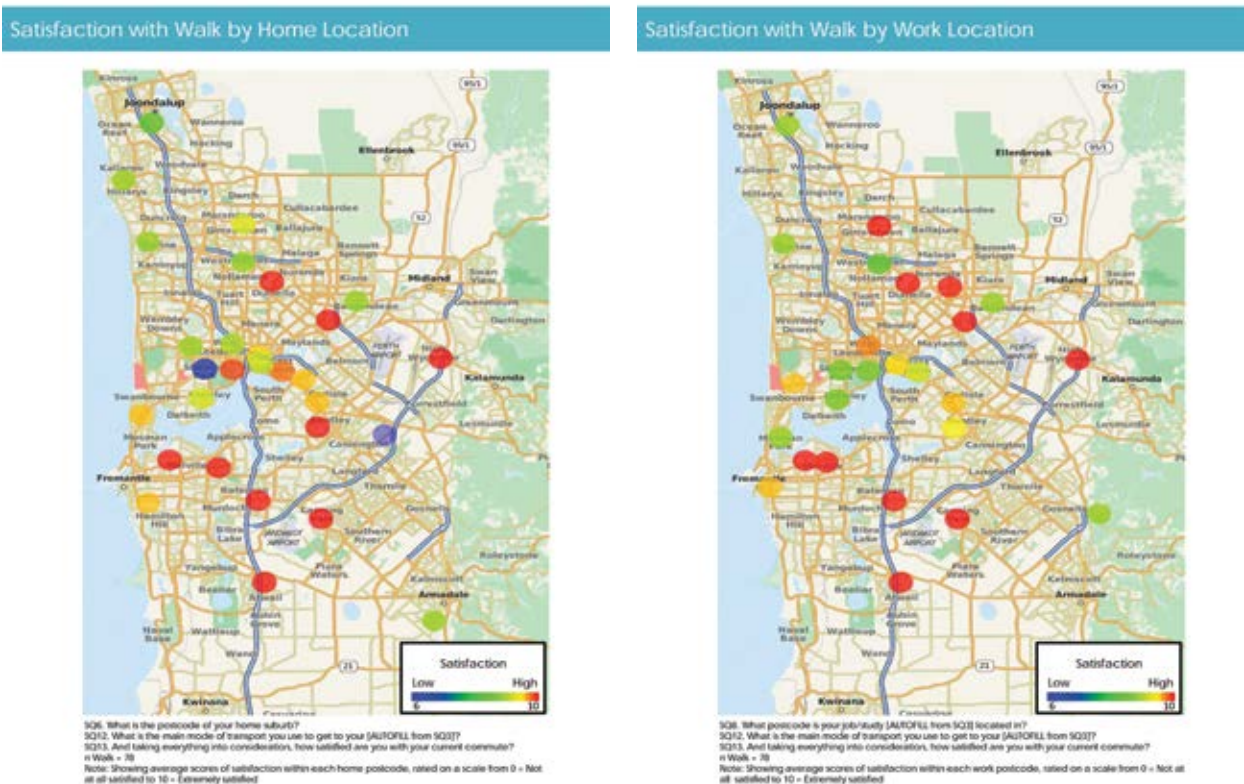


Figure 9h and 9i:  
 Satisfaction with Walk Commute by Home and Work Location  
 (Source: *Get a Move On! Commuter Survey, 2015*).





#### 9.4.1 *Active commuter characterisation: Characteristics which influence capacity for retention*

An analysis of some of the characteristics and stated circumstances of active transport commuters has found that:

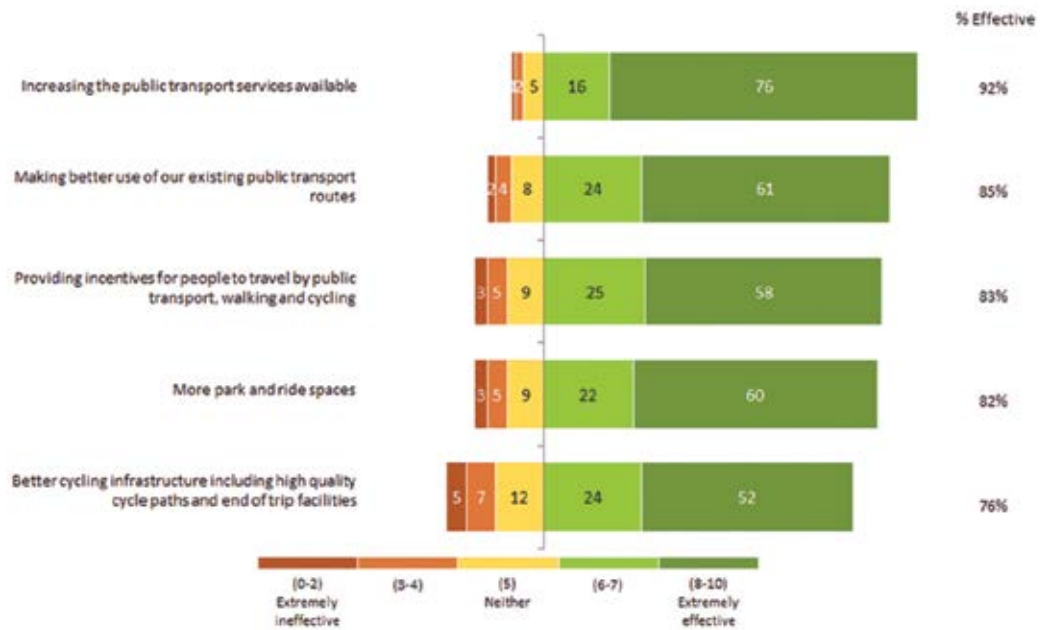
- Active transport commuters who work in a CBD postcode location are equally as likely to be satisfied as commuters who work in a non-CBD middle postcode location or an outer location.
- Active transport commuters who are neutrally satisfied or dissatisfied with their commute are more likely to work in a CBD or central location than those working in outer locations.
- Of all active transport commuters, 80% have access to end of trip facilities at their place of work or study.
- A majority (65%) of active transport commuters identify the main reason behind their commute choice to be related to health, the environment or enjoyment.
- All dissatisfied active commuters identify that safety concerns and/or poor quality cycle ways are the biggest frustrations they encounter on their daily commute.
- The average distance that walking commuters travelled to get to work or study for a one-way leg was 2.4 kilometres, while cyclists travelled an average of 11.1 kilometres one way.

### 9.5 Preferred Strategies for the Future

The *Get a Move On!* Commuter Survey asked respondents to rate the effectiveness of a number of public transport initiatives. This identified a very high level of support for investment in public transport (new and existing services) as well as initiatives to improve infrastructure and encourage public transport use, walking and cycling (83-92%). Support was also high for using technology to improve the efficiency of the existing transport system (75%) and commuters are likely to perceive strategies to increase the proportion of jobs in suburban centres as effective (75%). Support for investment in widening/improving roads was significantly lower (64%) than support for public transport initiatives.

Strategies least likely to be perceived as effective are user charges which aim to dis-incentivise driving as well as fund new public transport by, for example, introducing congestion charges for road use at peak periods and charging more for parking is low (26% to 34%).

Figure 9j: Perceived Effectiveness of Transport Strategies – Very High Support Initiatives (Source: Get a Move On! Commuter Survey, 2015).



When asked to prioritise specific public transport initiatives, respondents were most likely to identify investment in inner and middle suburban areas as being a priority, most notably light rail and rapid bus solutions for inner and middle locations, which were rated as first priority by 53% of respondents. Investment in new outer suburban heavy rail lines was rated as first priority by 24% of respondents.

Figure 9k: Public Transport Initiatives – Priority Ranking (Source: Get a Move On! Commuter Survey, 2015).

Commuters most favour a new light rail service for middle and inner areas, while rapid ferry services are clearly the lowest priority. The two heavy rail options and the rapid bus option were viewed similarly by commuters.

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Overall Rank
New light rail to move people in middle and inner areas	30%	22%	19%	20%	9%	<b>1</b> (256)
New outer suburban heavy rail lines	24%	20%	20%	24%	12%	<b>4</b> (280)
New rapid bus routes to move people in inner and middle suburbs	23%	22%	23%	21%	11%	<b>3</b> (275)
New inner and middle suburb heavy rail lines	17%	29%	28%	20%	7%	<b>2</b> (274)
Rapid ferry services on the Swan River	5%	7%	10%	16%	62%	<b>5</b> (423)

## 9.6 Summary of Key Findings

### Behavioural Motivators for Mode Shift

For most car commuters, unless the experience and convenience of car decreases or the cost of driving to work increases, they are unlikely to be motivated to shift from driving to alternative modes voluntarily.

People seek to maximise by making decisions they're happy with and trying to avoid bad decisions and bad outcomes. In Perth and Peel, this means choosing the fastest option or choosing an alternative in order to reduce monetary costs.

Status quo bias or habit pushes people to avoid making changes to their travel choices and ignore or not follow-up on new information affecting the relative appeal of public transport versus car commuting (confirmation bias). In Perth and Peel car is the status quo for the majority.

Inertia can be the result of insufficient motivation, and it is easy to over-estimate how driven individuals are to change and underestimate the need to apply as many forces as available onto motivation.

People avoid negative emotion, and commuters will consciously and subconsciously aim to avoid negative emotion associated with their commute. Currently the proportion of public transport and car commuters who report negative emotion is relatively even – reducing motivation for car commuters to change mode.

People minimise effort. Physical effort is a barrier to changing commuter behaviour and in Perth and Peel this is a key barrier to mode change.

### Car Commuters Capacity for Change

Approximately 25% of car commuters currently express dissatisfaction or neutral satisfaction with their existing commute and a preference to shift mode in an ideal world.

Car drivers who express dissatisfaction with car and a preference for mode shift are most likely to work in central locations outside the inner CBD.

A significant proportion of people are hindered in their capacity for mode shift by either a need to use their car at work or a need to drop off/pick up children.

Almost all commuters who express a preference for mode shift indicate that improved services would be required to facilitate change.

Only a small proportion of car commuters (8%) express a desire for mode shift and have motivators to shift voluntarily if services/access was improved. All other car commuters are likely to require improved services as well as barriers to continued driving to facilitate a shift.

White collar workers are most likely to identify a preference for mode shift.

Train and cycle are the most commonly preferred alternative modes among car drivers.

Approximately 43% of car commuters have been identified as committed drivers and these people are most likely to work in non-central locations.

**"I like to be outside  
and move, it keeps  
me fit and well"**

### Public Transport Users Capacity for Retention

Approximately 49% of public transport users choose public transport because they prefer it either for ideological and personal reasons or because they would rather travel by public transport than tackle traffic congestion or pay for parking.

69% of public transport commuters expressed satisfaction with their current mode of commute.

Public transport users who are dissatisfied are most likely to work in non-CBD locations.

Lack of access to parking and traffic congestion are key motivators for approximately 51% of public transport commuters.

33% of public transport users choose public transport for ideological or reasons of personal preference.

Approximately 15% of public transport users are dependent on public transport because they have no other viable option.

Train users are slightly more satisfied than bus commuters.

Committed and circumstantial public transport users are more likely to be aged over 35; have an income higher than \$100,000; and work in a central location than dependent users.

### Walking and Cycling Capacity for Retention

Walkers and cyclists are much more likely to be satisfied with their commute than people using other modes.

A majority of active commuters are aged over 35 and work in central locations.

Walkers and cyclists are most likely to identify walking or cycling as their ideal mode and the majority are likely to continue walking or cycling if circumstances permit.

### Preferred Solutions

Support for investment in public transport (new and existing services) as well as initiatives to improve infrastructure and encourage public transport use, walking and cycling is very high (83-92%).

Support for strategies to use technology to improve the efficiency of the existing transport system (75%) is high. There is also significant community support for increasing the proportion of jobs in suburban centres (75%).

Support for investment in widening/improving roads is significantly lower (64%) than support for investment in public transport.

Support for strategies to dis-incentivise driving and fund new public transport by, for example, introducing congestion charges for road use at peak periods and charging more for parking is low (26% to 34%).

A majority of respondents identify investment in inner and middle suburban areas as being a priority for Perth and Peel most notably light rail and rapid bus solutions for inner and middle locations, which were rated as first priority by 53% of respondents. New outer suburban heavy rail lines was rated as first priority by 24% of respondents.



## Section 10: Funding the Future

All levels of Government are facing considerable constraints in their budgets and this has become a significant impediment to the provision of infrastructure in Australia. In Western Australia, budget constraints have recently directly inhibited the delivery of new promised public transport projects.

It has therefore become essential for governments to look beyond traditional revenue sources to fund projects. This Section provides an overview of the reform and action needed to give Western Australia access to a more diverse pool of mechanisms to fund transport infrastructure projects from up front capital investment to long-term operational costs.

**Infrastructure Funding** refers to sources of funds used to pay for infrastructure. This includes funds sourced:

- Indirectly from community members via state or local government funds (i.e. taxation);
- Indirectly from infrastructure beneficiaries (for example value capture via specific levies); or
- Directly from infrastructure users (for example tolls on toll-roads or fares on public transport) (Committee for Melbourne, 2016).

**Infrastructure Financing** is money raised upfront to pay for infrastructure and includes monies raised from banks and other investors, which ultimately must be repaid.

If infrastructure is paid for directly from federal, state or local government funds, financing may not be required at all (Committee for Melbourne, 2016).

### 10.1 Inadequate 'Traditional' Funds for Infrastructure

In recent years there has been considerable discussion, debate and research which has warned of a looming infrastructure crisis in Australia as a result of a national infrastructure backlog and the lack of available resources to fund infrastructure. Funding has been consistently identified as the major constraint hindering delivery of the infrastructure projects Australia needs.

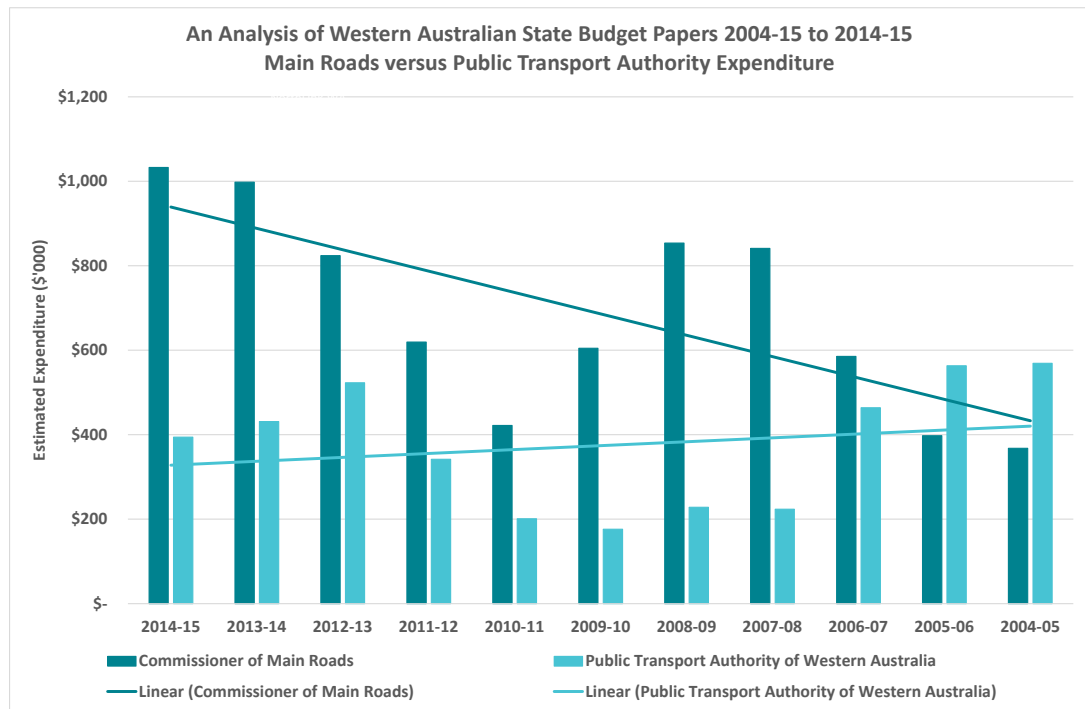
Western Australia is not immune to budgetary and infrastructure funding constraints.

Over the last two decades, federal and state governments have relied on surplus recurrent revenues to fund their infrastructure expenditure, however revenues available for investment in public infrastructure in Western Australia have not been adequate to deliver committed transportation projects for the Perth and Peel region and because of this, some proposed and committed projects have been deferred or abandoned.



An examination of WA State Budget figures from 2004-05 to 2014-15 shows that there has been significantly more expenditure by Main Roads than by the Public Transport Authority (Figure 10a).

**Figure 10a: An Analysis of Western Australian State Budget Papers 2004-05 to 2014-15 – Main Roads versus Public Transport Authority Expenditure (Source: The Government of Western Australia, 2016).**



Looking forward, it is evident that projected government operating surpluses after 2018-19 will not be large enough to fund all of the infrastructure needs of the State.

Furthermore, public sector net debt has grown significantly in recent years and is projected to continue to do so in the coming years. The State's revenue has slowed markedly and the State has lost its AAA credit rating (McLeod, 2014).

There is therefore a need for action to unlock new funding streams to ensure the provision of infrastructure to support Perth's mobility future.

## 10.2 Governance Reform and Rigorous Assessment

Over the past five years, a number of major research reports examining infrastructure funding in Australia have made recommendations for all levels of Government to address infrastructure funding issues.

These include the 2014 Productivity Commission report on Public Infrastructure; Infrastructure Australia's 2015 Infrastructure Audit; the 2016 Australian Infrastructure Plan (Infrastructure Australia); the 2014 Business Council of Australia's Infrastructure Funding and Financing Report; and the Review of Infrastructure Financing Options for Transport in Western Australia' prepared by Professor Paul McLeod (2014) on behalf of the Planning and Transport Research Centre (PATREC).

Core and common recommendations of these reports focus on:

- The need for a consistent pipeline of high-quality public infrastructure projects initiated by Governments.
- The need for project evaluation and prioritisation to be supported by transparent and rigorous cost benefit analysis.
- Avoiding a 'one size fits all' approach to infrastructure funding and financing by designing funding and financing models to suit individual infrastructure projects.
- Diversifying the pool of options for funding and financing infrastructure projects.
- Reform of investment and charging arrangements for transport infrastructure.

A unified view within this literature is that the development of a long-term pipeline of strategic transport projects that have been rigorously assessed through cost benefit analysis is essential to underpin future infrastructure funding. Specifically it is needed to:

- Improve project selection.
- Deliver consistent, long-term planning.
- Enable the identification of project specific funding and financing options early in the project process.
- Provide appropriate lead times and adequate information for Government and private sector financiers/funders/owners/operators to make investment decisions.
- Enable the cost of project development to be optimised.

# The State needs a deeper and more diverse pool of funding mechanisms

### 10.3 Australian Infrastructure Priorities

It is evident that improved and more consistent long-term planning for infrastructure, and better selection of infrastructure projects in Western Australia, are central to maximising the potential of existing, as well as accessing new, alternative funding mechanisms. This includes maximising the potential for Western Australia to access Australian Government grants by ensuring that a quality pipeline of infrastructure proposals are included in the national Infrastructure Priority List (IPL).

The 2016 IPL sits alongside the Australian Infrastructure Plan and prioritises proposed national infrastructure investments over the next 15 years (Infrastructure Australia, 2016). The IPL aims to assist Governments and businesses to invest in initiatives and projects that represent the most productive use of infrastructure funding. It identifies how the community and the private sector can best focus their investments.

Western Australian projects and initiatives are currently under represented on the IPL.

Of the 10 priority projects on the IPL, just one, the Perth Freight Link, is located in Western Australia. Similarly, one of the 27 'high priority initiatives' is a Western Australian project; and four of the 57 'priority initiatives' are located in WA. Three of the six Western Australian projects on the IPL are 'urban congestion' projects for Perth and Peel and one is a public transport project (Perth–Forrestfield Airport Rail Link).

By contrast, the IPL contains 32 projects for NSW including 10 'urban congestion' projects and initiatives for Sydney; 16 projects for Victoria including 12 'urban congestion' projects and initiatives for Melbourne; 13 projects for Queensland (three urban congestion projects for Brisbane and one for the Gold Coast); and 11 projects for South Australia (including four urban congestion projects for Adelaide).

### 10.4 Finance and Funding Options

It is clear that the State needs to be able to draw on a deeper and more diverse pool of funding mechanisms to deliver a quality transport network for Perth and Peel and that a blend of funding sources will be needed to fund future projects.

While Western Australia has primarily relied on State Operating Surpluses to fund new infrastructure, elsewhere in Australia and around the world new, innovative mechanisms are increasingly being applied to fund new transport projects.

Table 10a provides a brief overview of the costs and benefits of key infrastructure funding options for Western Australia. It has been adapted from McLeod (2014) with reference to Committee for Melbourne (2016), Langley (2015) and Newman et al. (2016). This is not intended to be a definitive list. However, it seeks to identify potential financing and funding alternatives including innovative private or public sector funding options that might be pursued over time.

**Table 10a: Costs and Benefits of Key Funding Options (Source: McLeod 2014; Langley, 2015; Newman et al., 2016).**

Funding Option	Summary of Benefits	Summary of Costs
Australian Government Grants provided unencumbered for metropolitan transport initiatives.	No ongoing servicing charge to the State. Enables the State to progress projects on a timely basis, and without an increase in debt levels.	Inconsistent with the beneficiary pays principle - current taxpayers pay for the full cost of the infrastructure although they will receive only a fraction of the benefits because the services will be delivered and operate over many years. No behaviour changing incentives accompany taxation funding.
State Operating Surpluses. Funds are allocated as part of the annual budget process.	No ongoing servicing charge to the State. To the extent that funding is from surplus revenues there is no net debt impact or ongoing service charges.	Inconsistent with the beneficiary pays principle - current taxpayers pay for the full cost of the infrastructure although they will receive only a fraction of the benefits because the services will be delivered and operate over many years. The State budget is some way away from being capable again of generating net cash surpluses to fund new and additional infrastructure.
Increments to taxes collected on fuel hypothecated to fund transport initiatives.	No ongoing service charge. Strengthens the link between the tax base and the beneficiary.	A large increment to the rate would be required to fund major transport projects, which would act as a disincentive to job creation in WA. Inconsistent with user pays principle.
Increments to the payroll tax rates to fund transport initiatives.	No ongoing service charge. State taxation instrument.	A large increment to the rate would be required to fund major transport projects, which would act as a disincentive to job creation in WA. Inconsistent with user pays principle.
Increments to the land tax rates to fund transport initiatives.	State taxation instrument. Least damaging to efficiency of the three State Government tax instruments.	Inconsistent with the user pays principle. The narrow base of this tax would impact a small number of taxpayers raising equity concerns.
Increments to the stamp duty rates to fund transport initiatives.	No ongoing service charge. State taxation instrument.	A large increment to the rate would be required to fund major transport projects, which would add to the inefficiencies of this tax – disincentive for buying and selling houses (mobility disincentive). Inconsistent with user pays principle.
General road user charges, heavy freight vehicle charges.	Raise revenue while at the same time generate pricing signals consistent with achieving the underlying transport planning objectives (i.e. more efficient use of the transport network).	Significant up-front technology costs can require extensive investment in physical infrastructure, collection systems and administration systems. Net gains from comprehensive road pricing are open to dispute.

Funding Option	Summary of Benefits	Summary of Costs
Congestion pricing and cordon area tolls - examples of congestion pricing include the Sydney Harbour Bridge Toll, Singapore Electronic Road Pricing Scheme and Stockholm Congestion Charge.	Capacity for implementation through sophisticated electronic pricing systems or simple zonal based schemes in which a fee must be paid to drive into a congested area, typically the central city.  Increases efficiency of road use by influencing behaviour and changing the pattern of road use and congestion.	Capacity to shift congestion to alternative routes, or for equality impacts specifically if a lack of alternatives are available.  Implementation arrangements may come at a cost in order to minimise avoidance practices.
Road tolls – A road is funded by imposing a fixed fee on its users. Often linked with direct benefits to users (such as reduced travel times). Large numbers of international and national examples.	Consistent with user pays principle by allowing infrastructure to be directly funded by beneficiaries.	Capacity to shift congestion to alternative routes, or for equality impacts if a lack of alternatives are available.
Parking levies (such as the Perth Parking Levy) where funds collected from levies on parking within a defined area are directly hypothecated to transport investments to serve that area. Perth was the first city in the world to introduce a parking levy and levies have now been successfully introduced in other cities nationally and internationally including Melbourne and Nottingham.	Can have specific behaviour changing objectives.  Funds can be hypothecated to support transport/public transport projects in targeted areas.  Has been successfully implemented in WA.	Marginally consistent with the beneficiary pays principle, only people who park in specific areas share the cost of new infrastructure.  Can face commuting/business opposition.  Revenue generated from this source is limited and will not provide a complete funding solution.
Vehicle and people based licence fees and fuel taxes.	Capacity to hypothecate funds directly to transportation projects.  Fund allocation subject to political intervention.	Marginally consistent with the beneficiary pays principle.  Fuel taxes may not retain real value over time.  Revenue from these sources will be limited and will not provide a complete funding solution.
Broad-based Transport Improvement Levy – a broad levy on all ratepayers to fund transport improvements at a flat or variable rate. Examples include the Gold Coast Rapid Transit.	Capacity to hypothecate funds directly to transportation projects.  Mechanisms to collect levies (such as rates) are already in place so relatively efficient to implement.	Marginally consistent with the beneficiary pays principle.  Funding is realised over time but relies on debt to finance projects up front.
Impact fees and developer contributions - a fee that is imposed on a new or proposed development project to pay for all or a portion of the costs of providing public services to the new development. Commonly applied by local government in the United States.	Can be applied to any incremental expansion of infrastructure capacity, from railway extensions through to the provision of local parks.  Broadly consistent with the beneficiary principle (when directly linked to the impacts of the estate).	In WA, developer contributions are directly linked to the impacts of the specific estate development. By contrast, in other countries such as the United States there is the ability to apply impact fees more widely.  Ability to collect fees on an ongoing basis may lead to inefficiencies and no incentive to deliver infrastructure in a cost-effective manner.  Not consistent with beneficiary pays principle where infrastructure is not directly linked to the development levied.



Funding Option	Summary of Benefits	Summary of Costs
Value capture and tax increment financing (also known as Benefitted Area Levies or Special Assessment Districts) - financing transport infrastructure through levies on the increase in property values attributable to the investment. National and international examples include the Melbourne Underground Rail Loop and Dallas Area Rapid Transit.	<p>Could contribute between 10% and 30% of directly related infrastructure costs within a defined improvement district.</p> <p>Variety of taxes, charges and mechanisms can be applied to capture the value uplift.</p> <p>Revenue must be directly hypothecated to the specific projects within a 'ring-fenced' location.</p> <p>An equitable way to fund infrastructure.</p> <p>Broadly satisfy the beneficiary pays principle.</p> <p>Can promote sustainable urban development by promoting development along transport corridors in infill locations.</p>	<p>Could have implementation difficulties because in some cases it may be difficult to link value uplift to transport investment.</p> <p>Value uplift may not be large enough to deliver substantial benefit/justify administration of levy/tax.</p> <p>Requires increases in debt to finance projects up front.</p> <p>Increasing revenue through value capture arrangements can compromise credit ratings.</p>
Entrepreneurial Rail Model - If land can be found to enable redevelopment by the private sector to sell and lease or to redevelop jointly with private owners or government for mutual benefit, then developers can create the capital to enable them to build, own and operate rail lines.	<p>Private sector responsible for meeting costs associated with the development and operation of transport infrastructure based on capital generated through the sale, lease or redevelopment of land along the route.</p>	<p>Relies on substantial profits associated with up-zoning and redevelopment of land and these profit levels may be difficult to achieve.</p> <p>Could be a high risk project for financial institutions (i.e. it would be difficult for developers to obtain access to capital required for infrastructure development).</p> <p>Infrastructure development may not be consistent with strategic land use and transport objectives for the region.</p>
Public private partnerships - government defines the infrastructure project and invites the private sector to participate in financing, funding, owning and operating the infrastructure project. The mix of private sector funding, ownership and operating control can vary.	<p>Enables government to secure private sector funds for infrastructure projects.</p> <p>Service costs can be funded by a mix of user charges, general government contributions, mainly taxation, shadow tolls, subsidies - including community service payments and availability payments.</p>	<p>Internationally and nationally there is a mixed record of PPP successes and failures.</p> <p>Lack of rigorous project assessment/management of risks/clarity about risk sharing are linked to PPP failure.</p> <p>Complex arrangements which can have long-term consequences for planning, transport and environmental policy that have balance sheet implications.</p> <p>Ongoing service costs.</p> <p>Demands on proceeds is high.</p> <p>Narrow focus on PPPs has led to a 'one-size-fits all' policy.</p>
Regulated asset base model – privatisation of brownfield assets in order to fund new infrastructure.	<p>Brownfield assets have well documented performance and therefore hold less risk than privatisation of new infrastructure assets.</p> <p>WA is well placed to pursue privatisation as part of the broader strategy to fund new transport infrastructure projects, the State has a well-developed system for regulating privatised natural monopolies operated through the Economic Regulation Authority.</p> <p>WA has candidates for privatisation that have not been privatised.</p>	<p>Requires a high quality independent and accountable regulatory system to ensure fair price for consumers and return to investors.</p> <p>Returns to investors have to be balanced against the wider stakeholder interest in these assets.</p> <p>Proceeds from privatisations will need to be allocated to debt repayment as well as new infrastructure opportunities, so funds may be less available than first considered.</p>

It is evident that a number of mechanisms rely on the introduction of new levies and charges to fund infrastructure. National and international examples demonstrate that, where these are applied there must be a *“clear and demonstrable link between the levy that beneficiaries (businesses and/or residents) pay, and the improvements they receive in return”* (Committee for Melbourne, 2016, p. 10).

## 10.5 Preferred Transport Funding Options for Western Australia

It is evident that no single financing option will provide a ‘silver bullet’ for transportation funding in Western Australia. It is also clear that there is no one-size-fits-all solution for funding individual transport projects.

*Get a Move On!* therefore identifies a need for a detailed investigation of all potential funding sources in order to identify the most appropriate mechanisms for Western Australia. It is also evident that the State Government should be open to the investigation and adoption of new and innovative funding initiatives as they arise in the future.

In summary, research undertaken for this project suggests that the State Government should focus on:

- Long-term planning for a pipeline of high-quality public infrastructure projects for Western Australia.
- Evaluating and prioritising infrastructure projects through transparent and rigorous cost benefit analysis undertaken early in the infrastructure planning process.
- Investigating and developing a diverse pool of infrastructure funding and financing options for Western Australia.
- Designing funding and financing models for individual infrastructure projects using mechanisms from the ‘funding pool’ early in the project process.
- Increasing the number of Western Australian infrastructure projects including urban congestion projects for Perth and Peel on the national Infrastructure Priority List.



## 10.6 Community and Business Views

The *Get a Move On!* Commuter Survey and Business Interviews asked Perth and Peel residents and businesses to provide feedback on possible mechanisms to fund transport infrastructure in the region.

Unsurprisingly community members and businesses primarily responded negatively to proposals for 'user pays' charges including congestion charging and parking levies. This negative perception reflects the direct cost implications of these types of charges for consumers and businesses.

Business interview responses also indicate that some businesses appreciate the need for new levies and charges to fund infrastructure but believe it is crucial that revenue raised is 'ring fenced' for the delivery of transport infrastructure projects.



### Responses of Business Interviewees:

"We are going to need innovative thinking to get projects off the ground"

"Investigate new ideas like Value Capture and the Entrepreneurial Rail Model"

"Raise parking fees to fund transport initiatives"

"Funds raised by new taxes or levies must be 'ring fenced' for intended use"



Business interview respondents also provided mixed feedback in regard to mechanisms such as Value Capture and the Entrepreneurial Rail Model with a general view that these models could deliver benefits but that additional research is needed to examine the benefits, unintended consequences and costs of implementation in detail.

Overall, community members and businesses strongly support investment in infrastructure and technology to deliver a more sustainable and efficient transport future, but there is little evidence of a unanimous view in regard to how this investment should be funded.

This reinforces the need for the State Government to undertake a detailed assessment of all possible infrastructure funding alternatives for Western Australia to accurately quantify costs and benefits and identify appropriate mechanisms to fund transport infrastructure in Perth and Peel.

## 10.7 Summary of Key Findings

### Funding the Future

Access to 'traditional' sources of funding for infrastructure is the major constraint hindering delivery of the infrastructure Australia needs.

There is a need for a long-term planning for a pipeline of high-quality public infrastructure projects for Western Australia.

All major infrastructure projects should be assessed through transparent and rigorous cost benefit analysis undertaken early in the infrastructure planning process.

Developing a diverse pool of infrastructure funding and financing options for Western Australia is essential to ensure projects can be delivered in the future.

Funding and financing models should be designed for individual infrastructure projects on a case by case basis using mechanisms from the 'funding pool'. This should be undertaken early in the project process.

There is a need to increase the number of Western Australian infrastructure projects including quality urban congestion projects for Perth and Peel on the national Infrastructure Priority List.

The State Government should undertake a detailed assessment of all infrastructure funding and financing options available to identify mechanisms appropriate for Western Australia.





## Project Team



### **Marion Fulker, CEO and Project Director**

Marion is the inaugural Chief Executive of the Committee for Perth Ltd. She took up the position in January 2007, having previously been the Executive Director of the Urban Development Institute of Australia (UDIA) WA Division. Marion has overseen the development of a number of landmark Committee for Perth research reports as part of the organisation's evidence based approach to the future of Perth. In the past decade, Marion has travelled extensively throughout the US, Europe, Australasia and the UK to examine how cities work. Her research focus has been on a range of topics including inner city vibrancy, urban renewal and public transport. Marion was named in 2015 as one of Australia's 100 Women of influence and recently awarded WA Telstra Business Woman of the Year - For Purpose & Social Enterprise. Marion's opinions on Perth's future are regularly sought by Government and the media.



### **Gemma Davis, Manager Research and Strategy and Project Manager**

Gemma is Manager of Research and Strategy for the Committee for Perth and is an Honorary Research Fellow with The University of Western Australia. She is a Policy and Strategic Planning professional with 19 years of experience and has prepared research and strategy reports for the Committee on a contract basis since 2007. During this time, she has also worked as a consultant in Australia and New Zealand, undertaking research and strategic planning projects for public and private organisations. She holds an Honours Degree in Urban and Regional Planning from Curtin University and has undertaken studies in Arts and Psychology at The University of Western Australia and Aboriginal Studies at Curtin University.



### **Georgia Harford-Mills, Research Officer and Project Coordinator**

Georgia is a Research Officer for the Committee for Perth, joining the organisation in 2014. She holds a Bachelor of Science, Geography and received First Class Honours in Urban and Regional Planning from The University of Western Australia. In addition, Georgia received the 2015 Patrick Armstrong Prize in Geography for her research thesis.



## Project Steering Committee



### **Patrick Walker, Chair**

**Executive General Manager, Advocacy and Members,  
Royal Automobile Club of Western Australia (Inc)**

Patrick Walker commenced his current position as Executive General Manager, Advocacy and Member Benefits at the RAC in July 2011. Immediately prior to this, he was the Director General, Department of Indigenous Affairs from 2008.

Patrick was a Commissioner at the Australian Competition and Consumer Commission (ACCC), Commissioner for Consumer Protection and Prices Commissioner in Western Australia for 10 years and during this period he was also a member of the Legal Aid Commission of Western Australia, the Medical Board of Western Australia, a Trustee of the national Travel Compensation Fund and Chairman of Workpower Incorporated, which provides employment opportunities for people with disabilities.

Patrick has also had extensive management experience in local government, with his most recent position being Chief Executive Officer at the City of Subiaco (1993 to 1998). During this time he was elected as State President and as a National Director of the Local Government Managers' Association.



### **Anne Still, Deputy Chair**

**General Manager, Public Policy, Royal Automobile Club of Western Australia (Inc)**

Anne is the Senior Manager, Policy and Research within RAC's Advocacy and Members team where she leads the formulation of RAC policy papers and demonstration projects relating to congestion management, transport planning, road safety, vehicles and transport affordability. She holds a Bachelor of Science and a Bachelor of Arts (honours) and has both public sector and private sector consulting experience, having led the delivery of transport projects in Australia, Dubai, the UK and New Zealand. Anne is passionate about the role of transport in connecting people and in developing safe, well-functioning and sustainable cities and places. Her role at the RAC is to work with partners to help deliver RAC's Mobility Agenda of safe, accessible and sustainable transport. Anne is a member and Immediate Past President of the Australian Institute of Traffic Planning and Management and a member of the Western Australian Road Safety Council, the Western Australian Black Spot Consultative Panel and the Western Australian Bike Network Plan Implementation Reference Group.



### **Graham Holden**

**Director Major Projects, Civil Infrastructure, Western Australia, AECOM**

Graham is Technical Director - Civil Infrastructure and Director, Major Projects for AECOM in Western Australia. In these roles he is involved in leading large multi-disciplinary teams in the successful delivery of complex Transportation and Civil & Water infrastructure projects. He holds a Master of Science in Rail System Engineering from the University of Sheffield and a Bachelor of Electrical and Electronic Engineering from the University of Nottingham (both in the UK).

Graham is an experienced business manager, project director/manager and railway systems specialist with over 27 years' experience in the Australian and international railway industry. Graham is a Chartered Engineer and has published a number of technical papers. He also regularly gives his time to mentor graduates and junior engineers.

Graham is a member of the Committee for Perth's Reshaping Working Group and is passionate about the development of Perth and the integration of transport and land use in effective planning and project delivery to achieve this.

He is also the current Executive Chair of the Railway Technical Society of Australasia, which is a joint Technical Society of Engineers Australia and the Institution of Professional Engineers New Zealand.

Graham is a keen cyclist, commuting by bicycle and racing on both his road and mountain bikes.

**Adeana Khoo****Transport Planner, AECOM**

Adeana is a Transport Planner at AECOM in Perth with 5 years of experience in a range of transport advisory roles including traffic modelling, transport planning studies, business cases and road safety audits. She holds a Bachelor's degree of Civil Engineering from The University of Western Australia and is a member of Engineers Australia and the Australian Institute of Traffic Planning and Management (AITPM). Adeana is particularly interested in the development of smart, sustainable cities and in encouraging others to reduce their dependence on cars.

**Robert Montanari****Executive Director, ANZ**

Robert is an Executive Director of International & Institutional Banking for ANZ based in Perth, responsible for relationship coverage of a range of diversified institutional and financial institution clients across Western Australia. He has held this position for almost 6 years and has over 25 years' experience in financial services, with his career starting in geotechnical consulting engineering in South Africa.

Robert has provided advice to both the public and private sectors on structuring and arranging of debt for both development and acquisition/sale transactions in the infrastructure, power, transportation, telecommunications, retail, agriculture and property sectors, in Australia, across the Asia-Pacific and Europe.

**Deborah Beeck****Director | Institutional, ANZ**

Deborah is a Director in ANZ's Global Loans and Advisory business, within the International & Institutional Banking division. In this role, she advises relationship teams on loan structuring solutions for institutional and corporate clients in WA, and leads the negotiation and execution of complex financing transactions.

Deborah joined ANZ in 2011 in Melbourne, returning home to WA in 2015. Prior to joining ANZ, Deborah was a senior banking lawyer at Herbert Smith Freehills, specialising in corporate finance, debt capital markets and property finance. She has worked in San Francisco as a business management trainee with a software services company and at World Vision Australia.

Deborah holds a Bachelor of Laws and Bachelor of Economics from Murdoch University, WA.

**David Milliken****Manager Planning Services, City of Subiaco**

David currently manages urban planning for the City of Subiaco and has 14 years' experience in urban and transport planning. His previous roles include transport planning for the Department of Transport, the Public Transport Authority and Transport for London. Major projects that David has been involved in include the MAX Light Rail project, and the Public Transport Plan for Perth. He has been involved in the Committee for Perth's Reshaping working group since 2013. David holds an MBA, a Master of Urban Planning and a Bachelor of Geography, all from Curtin University.

**Kelly Coombes****Field Services Senior Project Officer, City of Subiaco**

Kelly works as a Senior Project Officer for the City of Subiaco Field Services Branch which services local access and amenity, predominately relating to parking matters. Her role enables the delivery of projects set out in the City's Parking Strategy 2012-2016 and provides strategic direction for future parking management. Kelly's previous roles include working at the South Australian Magistrates Court and the City of Charles Sturt in South Australia and is also a member of Parking Australia.

**Peter Lee****Director, HASSELL**

As a Director of HASSELL, Peter is responsible for leading a multidisciplinary international design team engaged in a diverse range of major local, national and international projects. He has been a HASSELL board member since 2004 and has just been re-elected for another three year term. The Perth studio under the direction of Peter has been incredibly successful and has played an important role in designing significant projects which enhance our world class city.

**Sally Braidwood****Director Australian Reputation Centre, Ipsos Australia Pty Ltd**

Sally joined Ipsos in 2014 and leads the Public Affairs research division in Western Australia. Through its Social Research Institute and Reputation Centre, Ipsos Public Affairs conducts strategic research to understand and manage issues, advance reputations, determine shifts in attitude and opinion, enhance communications and evaluate policy.

As a research consultant, Sally has the opportunity to work closely with public and private sector clients to ensure the voice of the Western Australian public is represented in strategic planning and decision making across a range of areas including transport, infrastructure, housing, health, resources and energy.

Sally holds a Bachelor of Laws and a Master of Business Research from the University of Western Australia. In addition to this, Sally is a passionate supporter of Western Australian arts and culture and is the Board Chair of Propel Youth Arts WA, the peak body for youth arts in Western Australia.

**Scott Cameron****General Manager, Project Coordination, Finbar Group Limited**

Scott Cameron is General Manager, Project Coordination, at Finbar Group Ltd, Western Australia's largest apartment developer. He plays a key role in the acquisition and development of a number of multi-residential mixed-use and commercial projects in Western Australia. With over 10 years' experience in real estate and property development his key interests lie in apartment design, place making, sustainability, urban planning, and the myriad other aspects that comprise built form development.

**Rowan Maclean****Director, Campus Management, The University of Western Australia**

As Director of Campus Management at UWA, Rowan leads the planning, development and maintenance of the University's campus and land portfolio to support the University's teaching, research, recreational, cultural and community engagement objectives.

Her appointments to other boards include University Hall Council, and previously the UWA Sport and Recreation Association, VenuesWest from 2008- 2015 and Presbyterian Ladies College 2000 - 2007.

Prior to commencing with UWA in 2008, Rowan has had extensive career experience in the management of property and assets with senior roles held in the Department of Culture and the Arts, and the Department of Training and Employment. Rowan's strategic and corporate asset management experience also extends to working internationally.

A graduate from UWA, Rowan holds a Bachelor Degree in Architecture (1988).



### Steve Beyer

#### Executive Director, Integrated Transport Planning, Department of Transport

Steve Beyer is the Executive Director: Integrated Transport Planning with the Western Australian Department of Transport. He has 28 years of experience working for WA State Government transport agencies, including the Department of Transport, Main Roads and the Public Transport Authority.

Steve's experience and expertise covers transport policy, strategy and planning for freight and passenger transport in urban and regional areas. He has built up the Integrated Transport Planning team since mid-2010 to be a central part of the Transport Portfolio's strategic focus on long-term transport network plans and strategies for Moving People and Moving Freight.

Under Steve's leadership, the Integrated Transport Planning team has also undertaken feasibility studies and concept design for new transit systems such as light rail and bus rapid transit, overseen major new investment in cycling infrastructure, established a critical role in rail freight network and intermodal planning and driven integrated transport outcomes for strategic metropolitan centres.

Steve is a Fellow of Leadership WA (2008).



### Tony Monaghan

#### Manager – Corporate Communications, The Brand Agency

Tony is the Manager of Corporate Communications at The Brand Agency. He has more than 26 years' experience as a journalist, political adviser and corporate communications consultant. He worked for ABC TV, Channel 9, Channel 7 and was Head of News for the Mirror Group TV in London. While working for State Government, he was a media adviser, chief of staff and principal policy adviser for the Department of Premier and Cabinet.



## Project Researchers



**Gemma Davis**

**Manager Research and Strategy, Committee for Perth**

Gemma is Manager of Research and Strategy for the Committee for Perth and is an Honorary Research Fellow with The University of Western Australia. She is a Policy and Strategic Planning professional with 19 years of experience and has prepared research and strategy reports for the Committee on a contract basis since 2007. During this time, she has also worked as a consultant in Australia and New Zealand, undertaking research and strategic planning projects for public and private organisations. She holds an Honours Degree in Urban and Regional Planning from Curtin University and has undertaken studies in Arts and Psychology at The University of Western Australia and Aboriginal Studies at Curtin University.



**Georgia Harford-Mills**

**Research Officer, Committee for Perth**

Georgia is a Research Officer for the Committee for Perth, joining the organisation in 2014. She holds a Bachelor of Science, Geography and received First Class Honours in Urban and Regional Planning from The University of Western Australia. In addition, Georgia received the 2015 Patrick Armstrong Prize in Geography for her research thesis.



**Professor Jon Shaw**

**Associate Head of School, School of Geography, Earth and Environmental Sciences, Plymouth University**

Jon Shaw is Professor and Head of Geography at Plymouth University. He has been Associate Editor of the Journal of Transport Geography at Plymouth University and the Journal of Transport Geography. Jon is a Specialist Advisor to the Transport Committee of the House of Commons. He researches issues associated with mobility, transport policy and governance and is widely published in academic and policy literatures. Jon is also the co-author of the book 'The Transport Debate'.



**Professor Carey Curtis**

**Director, Urbanet Research Network**

Carey Curtis is Professor of City Planning and Transport, Director of the research network Urbanet, Visiting Professor University of Amsterdam, Guest Professor University of Gothenburg and Research Fellow (funded by the Vastara Gotland Region from EU seventh framework Marie Curie funding). Her research interests cover land use planning and transport planning, including a focus on city form and structure, transit oriented development, personal travel behaviour, accessibility planning, institutional barriers to sustainable transport, governance and transport policy. She has published over 90 papers, book chapters and books and has won five Australian Research Council research grants. Carey is Chair of the International Editorial Board of the Journal 'Urban Policy and Research' and a research articles Editor; she is also a member on the international editorial board of the Journal of Transport Land Use and a member of the Board of the World Society of Transport and Land Use Research. Carey is a member of the Planning Institute Australia and the UK Royal Town Planning Institute.



**Dr Jan Scheurer**

**Senior Research Fellow, School of Built Environment, Curtin University**

Dr Jan Scheurer is a Senior Research Fellow at Curtin University (Perth, Australia) and RMIT University (Melbourne, Australia and Barcelona, Spain). Jointly with Carey Curtis, he is the principal developer of the SNAMUTS tool. Trained in architecture and sustainability policy, his research straddles the gaps between urban design and spatial planning, transport policy, behaviour and mobility culture.





**Sally Braidwood**

Director Australian Reputation Centre, Ipsos Australia Pty Ltd

Sally joined Ipsos in 2014 and leads the Public Affairs research division in Western Australia. Through its Social Research Institute and Reputation Centre, Ipsos Public Affairs conducts strategic research to understand and manage issues, advance reputations, determine shifts in attitude and opinion, enhance communications and evaluate policy.

As a research consultant, Sally has the opportunity to work closely with public and private sector clients to ensure the voice of the Western Australian public is represented in strategic planning and decision making across a range of areas including transport, infrastructure, housing, health, resources and energy.

Sally holds a Bachelor of Laws and a Master of Business Research from the University of Western Australia. In addition to this, Sally is a passionate supporter of Western Australian arts and culture and is the Board Chair of Propel Youth Arts WA, the peak body for youth arts in Western Australia.

**"An expanded public transport network is crucial to the future of Perth"**



## Appendix 1: Activity Centre Assessment

As part of the *Get a Move On!* project, an assessment has been undertaken to identify the role of significant employment destinations in Perth and Peel. The assessment examines centres that employ more than 4,000 Perth and Peel residents using ABS SA2 data. These centres were examined using the following criteria:

- Total employed.
- Population.
- Vehicle ownership.
- Public transport use (both residents and workers).
- Economic activity.
- Labour productivity.
- Primary, secondary and tertiary industry of employment.

This analysis informed the proposed delineation of the roles between the various employment centres throughout the metropolitan region, in order to identify centres with the capacity to support road, public and active transport networks. The recommendations create a hierarchy of centres as follows:

- Capital City.
- Knowledge/Professional/Health Hub.
- Urban Village.
- Sub-regional Service Centre.
- Industrial Centre.

Perth CBD is the **Capital City** and the heart of economic activity. Benefits associated with a strong CBD include productivity through economic agglomerations, high levels of accessibility, vibrancy and public and active transport infrastructure use. Businesses surveyed identified a desire to be located in the CBD, with most major professional based employment providers indicating long-term permanency.

**Knowledge/Professional/Health Hubs** are activity centres in Perth and Peel that act as major knowledge/professional sector employment and public transport destinations. These are Subiaco, UWA/QEII, Fremantle, Curtin/Bentley Technology Park, Joondalup and Murdoch and each contain:

- Over 7,000 total employees.
- Over 4,000 employees in knowledge, professional or health based employment industries.
- A major university or higher education campus (with the exception of Subiaco).
- Over 12,000 local residents who use public transport to get to work.
- More residents who use public transport to commute than the Greater Perth average of 10.8%.

**Urban Villages** are employment centres located within five kilometres of the CBD that have the potential to act as effective transit oriented villages and accommodate an increased population in order to support a 'turn up and go' public transport system and facilitate greater uptake in active commuting. They include Victoria Park, Burswood, Wembley, West Leederville, South Perth, Mount Hawthorn, Leederville and Mount Lawley which are characterised by:

- Over 6,000 total employees.
- Over 10,000 local residents.
- Lower levels of vehicle ownership (not exceeding 1.6 vehicles per dwelling).
- More residents who use public transport to commute than the Greater Perth average of 10.8%.
- Employment generally categorised by health care and social assistance, retail trade, arts and recreation, public administration and safety and professional, scientific and technical services.

**Sub-regional Service Centres** act as service centres to their communities and provide opportunities for local employment and retail. They include Rockingham, Midland, Cannington, Mandurah, Morley, Melville, Stirling, Booragoon, Belmont, Claremont, Dianella, Armadale, Karrinyup, Hillarys, East Victoria Park, Wanneroo and Willetton and are characterised by:

- Over 4,000 total employees.
- Primary industry of employment is retail trade (with the exception of Rockingham).
- Employment typically in service based industries including public administration and safety, accommodation and food services, health care and social assistance and education and training.

**Industrial Centres** require high quality road access and are critical to the State's economy, generating significant economic activity and employing a large proportion of Perth's population. They include Osborne Park Industrial, Welshpool, Malaga, Canning Vale Commercial, Wangara, Belmont, Balcatta, Perth Airport, Maddington, Kewdale Commercial, Tonkin Park, Bibra Industrial, Kwinana Industrial, Forrestfield, Hazelmere – South Guildford, Henderson and O'Connor and are characterised by:

- Over 4,000 total employees.
- Approximately 2,000 or more workers employed in industrial based industries, including construction, manufacturing, transport, postal and warehousing and wholesale trade.
- Low levels of public transport use among workers, typically lower than 4% with the exclusion of Osborne Park Industrial.

The table below provides data for the 47 centres that each employ more than 4,000 people and characterises them under the proposed hierarchy. In total, these centres are the location for 73% of Perth's total jobs.

Designation		Total Proportion of Employment Base									
Capital City		134,276 (17.9%)									
Knowledge/Professional/Health Hub		90,885 (12.1%)									
Urban Village		39,042 (5.2%)									
Sub-regional Service Centre		108,106 (14.4%)									
Industrial Centre		178,617 (23.4%)									
Rank	ABS SA2 name	Total employed	Population	Vehicle ownership	PT USE (%) work location	PT (%) home location	Economic activity	Labour productivity	Major industry	Second major industry	Third major industry
1	Perth City (includes West Perth, East Perth and Northbridge)	134,276	25,504	1.1	39.6	21.7	40.7	123.7	Professional, scientific and technical services 29,603	Public administration and safety 19,439	Mining 14,688
2	Subiaco - Shenton Park	22,060	15,056	1.5	12.1	17.8	4.2	85.1	Health care and social assistance 6,229	Professional, scientific and technical services 4,242	Accommodation and food services 1,361
	Subiaco - Shenton Park										
3	Osborne Park Industrial	20,977	-	-	6.2	-	2.5	63.6	Construction 3,332	Retail trade 2,667	Manufacturing 2,199
4	Welshpool	17,946	16	1.6	2.9	-	2.5	64.9	Manufacturing 4,909	Transport, postal and warehousing 2,891	Wholesale trade 2,652
5	Nedlands - Dalkeith –	17,711	17,551	1.8	9.6	10.0	1.6	62.9	Health care and social assistance 7,687	Education and training 4,150	Professional, scientific and technical services 1,205
	Crawley UWA/QEII										



Rank	ABS SA2 name	Total employed	Population	Vehicle ownership	PT USE (%) work location	PT (%) home location	Economic activity	Labour productivity	Major industry	Second major industry	Third major industry
6	<b>Fremantle</b>	17,574	13,245	1.4	9.2	13.6	1.0	60.6	Health care and social assistance 4,174	Transport, postal and warehousing 1,934	Accommodation and food services 1,854
7	<b>Malaga</b>	15,418	13	2	1.6	-	1.6	51.8	Manufacturing 4,991	Construction 2,303	Wholesale trade 1,977
8	<b>Joondalup - Edgewater</b>	14,872	13,727	1.8	5.9	14.1	1.4	53.2	Health care and social assistance 3,180	Retail trade 2,799	Education and training 2,499
9	<b>Canning Vale Commercial</b>	14,761	-	-	2.8	-	0.5	50.2	Manufacturing 3,792	Wholesale trade 3,446	Construction 1,598
10	Madeley - Darch – Landsdale <b>Wangara</b>	13,635	18,976	2.1	1.6	7.7	1.5	52.4	Manufacturing 3,726	Construction 2,693	Retail trade 1,550
11	<b>Belmont</b> - Ascot - Redcliffe	12,235	13,288	1.7	3.5	10.4	0.8	51.5	Wholesale trade 1,560	Construction 1,238	Manufacturing 1,191
12	<b>Rockingham</b>	11,990	14,827	1.5	3.9	8.8	0.9	50.7	Public administration and safety 2,954	Retail trade 2,087	Manufacturing 1,118
13	<b>Midland</b> - Guildford	11,713	9,587	1.5	5.4	11.4	0.7	50.4	Retail trade 2,711	Public administration and safety 2,460	Health care and social assistance 1,260
14	Bentley - Wilson - St James <b>Curtin</b>	11,446	19,558	1.5	6.2	16.6	0.8	63.8	Education and training 4,288	Health care and social assistance 1,942	Manufacturing 992

Rank	ABS SA2 name	Total employed	Population	Vehicle ownership	PT USE (%) work location	PT (%) home location	Economic activity	Labour productivity	Major industry	Second major industry	Third major industry
15	<b>Victoria Park - Lathlain - Burswood</b>	10,827	13,609	1.6	7.8	19.3	0.8	56.1	Arts and recreation services 2,574	Construction 1,090	Retail trade 1,082
16	<b>Balcatta - Hamersley</b>	10,824	14,973	1.7	2.7	9.8	0.6	56.7	Manufacturing 1,714	Construction 1,601	Retail trade 1,098
17	<b>Perth Airport</b>	10,004	54	-	1.6	-	0.7	63.0	Transport, postal and warehousing 4,704	Retail trade 940	Public administration and safety 868
18	<b>Maddington - Orange Grove - Martin</b>	8,357	11,798	1.9	3.1	8.8	0.5	55.1	Manufacturing 1,614	Construction 1,213	Retail trade 1,154
19	<b>Wembley - West Leederville - Glendalough</b>	8,349	16,566	1.5	8.5	16.1	0.6	59.8	Health care and social assistance 3,975	Education and training 569	Retail trade 464
20	<b>Cannington - Queens Park</b>	7,813	14,948	1.7	8.3	15.8	0.8	62.9	Retail trade 2,359	Public administration and safety 1,268	Health care and social assistance 688
21	<b>Kewdale Commercial</b>	7,496	-	-	1.7	-	4.0	77.8	Manufacturing 2,061	Transport, postal and warehousing 1,570	Wholesale trade 1,145
22	<b>Mandurah</b>	7,491	8,571	1.3	2.8	9.2	3.6	76.6	Retail trade 2,025	Accommodation and food services 1,042	Public administration and safety 793
23	<b>Bayswater - Embleton - Bedford Tonkin Park</b>	7,383	21,209	1.7	3.8	14.7	2.5	64.9	Manufacturing 1,699	Construction 1,031	Health care and social assistance 744

Rank	ABS SA2 name	Total employed	Population	Vehicle ownership	PT USE (%) work location	PT (%) home location	Economic activity	Labour productivity	Major industry	Second major industry	Third major industry
24	<b>South Perth - Kensington</b>	7,281	16,436	1.6	5.3	14.0	2.8	74.2	Public administration and safety 1,350	Professional, scientific and technical services 1,158	Health care and social assistance 780
25	<b>Bibra Industrial</b>	7,222	19	-	1.5	-	2.3	65.4	Manufacturing 2,344	Construction 1,177	Wholesale trade 867
26	<b>Murdoch - Kardinya</b>	7,222	12,115	2	6.0	12.9	2.8	90.2	Education and training 2,006	Health care and social assistance 2,001	Construction 850
27	<b>Kwinana Industrial</b>	7,218	10	-	1.7	-	2.0	72.3	Manufacturing 3,544	Construction 1,271	Transport, postal and warehousing 457
28	<b>Morley</b>	6,905	20,302	1.8	6.0	8.4	2.5	101.8	Retail trade 2,207	Accommodation and food services 642	Health care and social assistance 570
29	<b>Melville</b>	6,509	15,455	1.8	3.3	8.7	1.3	68.4	Retail trade 1,510	Health care and social assistance 1,173	Education and training 623
30	<b>Mount Hawthorn - Leederville</b>	6,482	10,298	1.6	11.9	13.7	2.1	105.6	Electricity, gas, water and waste services 1,272	Professional, scientific and technical services 940	Education and training 735
31	<b>Stirling - Osborne Park</b>	6,458	13,204	1.8	4.7	10.6	0.9	61.1	Health care and social assistance 968	Manufacturing 858	Construction 785
32	<b>Booragoon</b>	6,359	13,870	1.8	6.5	12.7	1.1	60.7	Retail trade 1,959	Health care and social assistance 659	Professional, scientific and technical services 465

Rank	ABS SA2 name	Total employed	Population	Vehicle ownership	PT USE (%) work location	PT (%) home location	Economic activity	Labour productivity	Major industry	Second major industry	Third major industry
33	<b>Forrestfield - Wattle Grove</b>	6,307	15,934	2	0.8	6.0	1.2	74.4	Transport, postal and warehousing 1,547	Manufacturing 1,276	Retail trade 504
34	<b>Mount Lawley - Inglewood</b>	6,103	16,207	1.6	4.9	16.8	1.3	95.7	Health care and social assistance 1,473	Education and training 1,307	Retail trade 754
35	Bassendean - Eden Hill – Ashfield <b>Tonkin Park</b>	5,696	14,404	1.7	4.0	12.2	1.0	79.7	Manufacturing 1,829	Health care and social assistance 466	Wholesale trade 426
36	Rivervale - Kewdale – Cloverdale <b>Belmont</b>	5,617	21,862	1.6	5.3	12.1	1.6	78.8	Retail trade 1,005	Health care and social assistance 549	Education and training 534
37	<b>Claremont (WA)</b>	5,167	7,593	1.6	9.8	15.1	1.3	61.4	Retail trade 1,361	Accommodation and food services 859	Health care and social assistance 807
38	<b>Dianella</b>	4,870	23,112	1.8	4.7	8.8	0.6	64.4	Retail trade 1,038	Education and training 663	Health care and social assistance 535
39	<b>Armadale - Wungong - Brookdale</b>	4,807	16,241	1.6	4.2	9.4	1.8	68.7	Retail trade 1,150	Professional, scientific and technical services 595	Health care and social assistance 556
40	<b>Karrinyup - Gwelup - Carine</b>	4,685	18,927	2	4.4	8.5	1.4	93.4	Retail trade 1,568	Professional, scientific and technical services 710	Construction 785
41	<b>Hazelmere - South Guildford</b>	4,652	3,634	2	3.0	7.9	0.7	54.8	Transport, postal and warehousing 1,007	Other services 778	Wholesale trade 632

Rank	ABS SA2 name	Total employed	Population	Vehicle ownership	PT USE (%) work location	PT (%) home location	Economic activity	Labour productivity	Major industry	Second major industry	Third major industry
42	Hillarys	4,597	10,680	2.1	5.2	10.3	1.2	73.5	Retail trade 1,479	Accommodation and food services 975	Education and training 308
43	East Victoria Park - Carlisle	4,476	14,990	1.6	5.8	18.3	0.6	59.7	Retail trade 671	Health care and social assistance 556	Education and training 436
44	Wanneroo	4,406	22,953	2	2.0	8.3	0.6	58.6	Retail trade 687	Public administration and safety 591	Wholesale trade 426
45	Henderson	4,395	14	-	1.8	-	1.2	68.3	Manufacturing 2,202	Construction 715	Professional, scientific and technical services 342
46	Willetton	4,243	17,391	2	2.9	12.8	-	-	Retail trade 847	Education and training 648	Construction 359
47	O'Connor (WA)	4,091	-	-	3.5	-	0.3	57.7	Manufacturing 1,437	Retail trade 581	Wholesale trade 486



## Appendix 2: Commuter Survey Questions

### Committee for Perth Get A Move On

<b>Job book Number</b>	15-056678-01
<b>Job Name</b>	Get A Move On
<b>Client</b>	Committee for Perth
<b>Date</b>	29.10.2015
<b>Version Number</b>	V1
<b>Authors</b>	Sally Braidwood

### Quotas

- Aim for spread of age, gender and suburb (best effort)

CAR SAMPLE 1	Metro Residents	Main mode of transport used to get to job/study = Car	n=200 (first 200 respondents)	SQ12
CAR SAMPLE 2	Metro Residents (Most convenient public transport is a bus stop) and can estimate journey time	Main mode of transport used to get to job/study = Car	n=400	SQ12, SQ17, SQ18
CAR SAMPLE 3	Metro Residents (Most convenient public transport is a Park and Go train station) and can estimate journey time	Main mode of transport used to get to job/study = Car	n=400	SQ12, SQ17, SQ18
TRAIN SAMPLE	Metro Residents	Main mode of transport used to get to job/study = Train	n=200	SQ12
BUS SAMPLE	Metro Residents	Main mode of transport used to get to job/study = Bus	n=200	SQ12
CYCLE SAMPLE	Metro Residents	Main mode of transport used to get to job/study = Cycle	n=150	SQ12
WALK SAMLE	Metro Residents	Main mode of transport used to get to job/study = Walk	n=150	SQ12

### Additional information

#### Key:

<b>Name and Label</b>	# ____ #	i.e. #SQ3i. Age#
<b>Question type</b>	{ ____ }	I.E. {SINGLE} {MULTIPLE}

		{INTEGER (RANGE 16-64)} {DECIMAL (RANGE 16.5 - 63.5)} {TEXT (RANGE 10-20)}
Question Filter/Routing	< ____ >	I.E. < ASK IF Q1 = 1>
Programming instructions	[ ____ ]	I.E. [ RANDOMISE STATEMENTS]
Changes	HIGHLIGHT	

## Email invitation

Dear XXXX,

We are conducting a short survey on behalf of Committee for Perth. This survey will help us and the Committee for Perth understand transport needs in Perth.

There are no right or wrong answers. We're just interested in your views.

The survey will take around 20 minutes to complete.

If you participate, the information you provide will be used only for research purposes.

**To start this survey, please click [here](#)**

Thank you for taking the time to take part.

### **Privacy statement:**

*The results of this study will be reported in aggregate and your responses will remain anonymous. You should be aware that your name and contact details will be removed from your responses to this survey once all surveying is complete. When this has been done we will no longer be able to identify you with the responses you provided.*

*You will also be asked if you would be interested in taking part in other research about science and technology or whether you would like to receive the results to the study. If you agree, your name and contact details will be collected and will only be used to contact you about the research.*

*You are able to contact us to request that we delete all of your personal information. If you wish to do this, please email xxxx .*

*Any questions about the bona fides of Ipsos can be made to the Australian Market and Social Research Society enquiry line on 1300 36 4830 or Julie Young of the Ipsos Social Research Institute on (03) 9946 0888.*



## Introduction page

Thank you for agreeing to participate in this survey on your transport needs.

This survey will take approximately 20 minutes to complete.

### Instructions:

Please DO NOT USE the 'Back' and 'Forward' buttons in the browser. Doing so means you may have to start the survey again. Please use the buttons at the bottom of each screen.

If you have difficulties with the questions or with accessing the survey online please call xxxx on xxxx.

### **Privacy statement:**

*The results of this study will be reported in aggregate and your responses will remain anonymous. You should be aware that your name and contact details will be removed from your responses to this survey once all surveying is complete. When this has been done we will no longer be able to identify you with the responses you provided.*

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*You are able to contact us to request that we delete all of your personal information. If you wish to do this, please email xxxx.*

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## SECTION 1: SCREENER QUESTIONS

**SQ1** Which of the following best describes your age?  
 {SINGLE RESPONSE}  
 #SQ1 SQ1 Age#

[TERMINATE IF CODES 1 OR 99]

17 years or under [Terminate]	01
18-24 years	02
25-34 years	03
35-44 years	04
45-54 years	05
55-64 years	06
65+ years	07
I'd prefer not to say [Terminate]	99

**SQ2** And are you?  
 {SINGLE RESPONSE}  
 #Error! Reference source not found. Error! Reference source not found. Gender#

Male	01
Female	02

**SQ3** SQ3. Do you commute outside of your home to attend a job and/or to attend formal study three days a week or more?

If you commute for both work and study more than three days a week, please choose the one you commute for most often.

{SINGLE RESPONSE}  
 #Error! Reference source not found.3 Error! Reference source not found.3 Commuteforjob#

Yes, I commute outside of my home three days a week or more for <b>work</b> [Go to SQ5]	01
Yes, I commute outside of my home three days a week or more for <b>study</b> [Go to SQ5]	02
No, I don't commute outside of my home more than three days a week for either work or study [TERMINATE]	

**SQ5.** Are you a FIFO (fly-in, fly-out) worker?  
 {SINGLE RESPONSE}  
 #Error! Reference source not found.5 Error! Reference source not found.5 FIFOornot#

Yes [Terminate]	01
No [Continue]	02



**SQ6.** What is the postcode of your home suburb?

{OPEN RESPONSE}

#Error! Reference source not found.6      Error! Reference source not found.6 Suburb#

**SQ7.** And how long have you lived in your home suburb?

{SINGLE RESPONSE}

#Error! Reference source not found.7      Error! Reference source not found.7 Tenure#

Less than 1 year	01
1-2 years	02
3-5 years	03
6-10 years	04
11+ years	05

**SQ8**      What postcode is your [job/study \[AUTOFILL from SQ3\]](#) located in?

{OPEN RESPONSE}

#SQ8    SQ8 SUBURB#

**SQ9**      And how long have you been [working/studying \[AUTOFILL from SQ3\]](#) in that location?

{SINGLE RESPONSE}

#Error! Reference source not found.9      Error! Reference source not found.9 Workorstudytenure#

Less than 1 year	01
1-2 years	02
3-5 years	03
6-10 years	04
11+ years	05

**SQ10**      What distance do you have to commute from your home to where you [work/study \[AUTOFILL from SQ3\]](#)? Please provide your best estimate of the distance of your one way trip in kilometres.

{OPEN NUMERICAL RESPONSE}

#Error! Reference source not found.10      Error! Reference source not found.10 Distance#

**SQ12** What is the main mode of transport you use to get to your [AUTOFILL from SQ3]? (Note: we are interested in the mode of transport you use most often or spend the most amount of time using).

{SINGLE RESPONSE}

#Error! Reference source not found.12 Error! Reference source not found.12 Modeoftransport#

[Recruit to quota]

Car	01
Train	02
Bus	03
Cycling	04
Walking	05
Other (Please specify) [Terminate]	98

**Ask if SQ12=1**

**SQ12a.** And are you usually:

The driver of the car	01
A passenger in the car	02

**SQ11** And, on average, how long does it take you to make this commute from your home to where you work/study? Please provide your best estimate of the time of your one way trip in hours and minutes. **SQ11A=hours, SQ11B=minutes**

{OPEN NUMERICAL RESPONSE}

#Error! Reference source not found.11 Error! Reference source not found.11 Time#

[Allow numerical response in hours and minutes]

[Show 1 box with "hours" and 1 box with "minutes" as the parameter used for time]

**SQ13** And taking everything into consideration, how satisfied are you with your current commute?

{SINGLE RESPONSE}

#Error! Reference source not found.13 Error! Reference source not found.13

Satisfactionwithcurrentmode#

Not at all satisfied										Extremely satisfied
0	1	2	3	4	5	6	7	8	9	10

**SQ14** Do you just use one mode of transport for your commute or do you use multiple?

*An example of a multiple mode journey would be walking to the bus stop, getting a bus to the train station and then getting a train to your destination; this would be three mode journey. Please only include walking as a mode of transport if it is for a period of 5 minutes or more.*

{SINGLE RESPONSE}

#Error! Reference source not found.14 Error! Reference source not found.14 Multiplemodesornot#

Just one mode [Go to SQ16]	01
Multiple modes [Go to SQ15]	02

<ASK SQ15 IF SQ14=02>

**SQ15** And what transport modes does your typical one-way commute involve?

*Please select as many of the modes below as apply to you. Please only include walking as a transport mode if it is for a duration for 5 minutes or more.*

{MULTIPLE RESPONSE}

#Error! Reference source not found.15 Error! Reference source not found.15 Multiplemodes#

Car as driver	01
Car as passenger	02
Park and Ride <a href="#">ask SQ15a</a>	03
Kiss and Ride <a href="#">ask SQ15a</a>	04
Walk and public transport <a href="#">ask SQ15a</a>	05
Cycle and public transport <a href="#">ask SQ15a</a>	06
Cycle	07
Walk	08
Motorbike/Scooter	09
Taxi (standard)	10
Uber	11
Other (please specify)	98

**SQ15a.** And what form of public transport do you use?

Bus	01
Train	02
Other (please specify)	98

**SQ16** Which of the following modes of transport have you used in the past 12 months to get to your [\[AUTOFILL from SQ3\]??](#)

{MULTIPLE RESPONSE}

#Error! Reference source not found.16 Error! Reference source not found.16 Modesused#

Car	01
Train	02
Bus	03
Cycle	04
Walk	05
Taxi (standard)	06
Uber	07
Other ( <a href="#">Please specify</a> )	98

**SQ17** You indicated that you currently commute to [work/study \[AUTOFILL from SQ3\]](#) via [\[AUTOFILL from SQ12\]](#), if that option were not available to you, which of the following modes of transport would you use instead?

{MULTIPLE RESPONSE}

#Error! Reference source not found.16 Error! Reference source not found.16 Modesused#

<EXCLUDE CURRENT MAIN TRANSPORT MODE FROM SQ12 FROM LIST OF OPTIONS>

Car	01
Train	02
Bus	03
Cycling	04
Walking	05
Other ( <a href="#">Please specify</a> )	98

**SQ18** And how long would it take you to commute **one way** to [\[AUTOFILL from SQ3\]](#) via [\[AUTOFILL from SQ17\]](#)? Please provide your best estimate of the time of your one way trip in hours and minutes  
**SQ18A=hours, SQ18B=minutes**

Enter response as hours and minutes	
Don't know	98

<ASK SQ19 – SQ21 OF CAR USERS>

**SQ19** Thinking about the public transport options that are available to you to get to [AUTOFILL from SQ3] which of the following options is more convenient for you to access?

Bus	01
Train	02
Both the same	03

[If car commuter, classify as either Car Sample 2 or Car Sample 3. If answer 03 at SQ19 classify as Car Sample 2 or 3 depending on which is lower on meeting quota]

**SQ20** And how long would it take you to commute **one way** to [AUTOFILL from SQ3 ] via [AUTOFILL from SQ19]? Please provide your best estimate of the time of your one way trip in hours and minutes. Please include the time it will take you to get from home to your nearest station, the public transport journey time and the time to reach your final destination once off public transport.  
**SQ20A=hours, SQ20B=minutes**

Enter response as hours and minutes	
Don't know	98

[If 98 above exclude from Car Sample 2 or 3 – can continue as Car Sample 1]

**SQ21** How would you get from your home to the nearest [AUTOFILL from SQ19]?

Walk/run	01
Cycle	02
Drive and park	03
Get dropped off	04
Other (Please specify)	99

### Termination script:

Thank you for agreeing to take part in the survey. Unfortunately you are not one of the people we are looking for in this study but thank you again for your time.

CREATE HIDDEN HQTRANSPORTMODE BASED ON SQ12:

NON CAR USERS = 02 TO 98

CAR USERS = 01

TRAIN USERS = 02

BUS USERS = 03

WALKERS = 05

CYCLISTS = 04



## SECTION 2: CURRENT TRANSPORT BEHAVIOUR

### NON CAR USERS

#### <ASK Q1 OF NON CAR USERS>

**Q1** If you wanted to drive a car to [AUTOFILL from SQ3], would you be able to park your car somewhere nearby?

{SR}

#0 0 Accesstocarparking#

Yes [Go to Q2]	01
No [Skip the rest of Non Car Users & Car Users section, go to Train and Bus Users section]	02

#### <ASK Q2 OF NON CAR USERS AND IF Q1 = 01>

**Q2** And which of the following best describes the car parking that would be available to you?

{MR}

#02 02 Carparking#

A car bay provided to me that I pay for	01
A car bay provided to me that I do not pay for	02
Free off street parking	03
Paid off street parking	04
Free street parking	05
Paid street parking	06
Other (please specify)	97

#### <ASK Q3 OF NON CAR USERS AND IF Q2 = 01 OR 04 OR 06>

**Q3** And if you were to use that parking, what would the cost be?

*Please provide the amount as a daily, weekly, monthly or annual cost; whichever is easier.*

{NUMERICAL RESPONSE}

#03 03 Cost#

[Allow respondent to provide numerical response to 1 option only]

Daily	01	[Allow numerical response] [Show AUD]
Weekly	02	[Allow numerical response] [Show AUD]
Monthly	03	[Allow numerical response] [Show AUD]
Annual amount	04	[Allow numerical response] [Show AUD]

#### <ASK Q4 OF NON CAR USERS AND IF Q1 = 01>

**Q4** Given that your main mode of transport to [AUTOFILL from SQ3] is [AUTOFILL from SQ12] and you do have access to car parking, why do you still choose to commute via [AUTOFILL from SQ12]?

{OPEN RESPONSE}

#04 04 Cost#

## CAR USERS

### <ASK Q5 OF CAR USERS>

**Q5** Where do you park where you [AUTOFILL FROM SQ3]?  
{MR}

#05 05 Carparking#

A car bay provided to me that I pay for	01
A car bay provided to me that I do not pay for	02
Free off street parking	03
Paid off street parking	04
Free street parking	05
Paid street parking	06
Other (Please specify)	98

### <ASK Q6 OF CAR USERS AND IF Q5 = 01 OR 04 OR 06>

**Q6** And how much do you pay for this car parking **per day**?  
{NUMERICAL RESPONSE}

#06 06 Cost#

[Allow respondent to provide numerical response to 1 option only]

[Allow numerical response] [Show AUD]

### <ASK Q7 OF WORK CAR USERS>

**Q7** Do you regularly use your car during the day while you are at work or to run errands on the way to or from [AUTOFILL FROM SQ3]?  
{SR}

#07 07 Regularusage#

Yes	01
No	02

### <ASK Q8 OF CAR USERS>

**Q8** Approximately how much does it cost you each day to commute **to and from** [AUTOFILL from SQ3] by car? *Please include the cost of petrol and parking but do not include the cost to buy, maintain or licence your vehicle*

{NUMERICAL RESPONSE}

#08 08 Costperday#

[Allow numerical response in dollars and cents per day]

[Show 1 box with "dollars" and 1 box with "cents" as the parameter used for cost]

## TRAIN AND BUS USERS

### <ASK Q10 OF TRAIN USERS>

**Q10** How do you usually get to the train station?

{SINGLE}

#010 010 Howgettotrain#

Walk	01
Drive and park car in designated station parking	02
Drive and park car in area other than designated station parking	03
Get dropped off	04
Bus	05
Other (Please specify)	98

### <ASK Q11 OF TRAIN USERS>

**Q11A.** What distance do you have to travel to the train station?

*Please use decimals if the distance is less than 1 km (e.g. 800 metres would be entered as 0.8 kms.)*

{NUMERICAL RESPONSE}

#011 011Howfartotrain#

[Allow numerical response in kms]		[Show label in "kms"]
-----------------------------------	--	-----------------------

**Q11B.** How long does it take you to travel to the train station?

{NUMERICAL RESPONSE}

#011 011Howfartotrain#

[Allow numerical response minutes]		[Show label in "min"]
------------------------------------	--	-----------------------

### <ASK Q12 OF BUS USERS>

**Q12.** How do you usually get to the bus station/stop?

{SINGLE}

#012 012 Howgettobus#

Walk	01
Drive and park car in designated station parking	02
Drive and park car in area other than designated station parking	03
Get dropped off	04
Other (Please specify)	98

### <ASK Q13 OF BUS USERS>

**Q13A.** What distance do you have to travel to the bus station/stop?

*Please use decimals if the distance is less than 1 km (e.g. 800 metres would be entered as 0.8 kms.)*

{NUMERICAL RESPONSE}

#013 013Howfartobus#

[Allow numerical response in kms]	02	[Show label in "kms"]

**Q13B.** How long does it take you to travel to the bus station?

[Allow numerical response in minutes]	01	[Show label in "minutes"]
---------------------------------------	----	---------------------------

<ASK Q14 OF BUS OR TRAIN USERS>

**Q14** And how many public transport transfers do you usually make during your daily commute? *Please limit this to your journey one way, e.g. from home to work.*

{SINGLE}

#014 014Numberoftransfers#

0	01
1	02
2	03
3	04
4	05
5	06
6	07
7	08
8	09
9	10
10	11

<ASK Q15 OF BUS OR TRAIN USERS>

**Q15.** Thinking about all elements of your commute to work or study, how much does this commute cost you?

For example, if you drive and park at the train station and catch the train to work, please include petrol and parking costs as well as the cost of your train fare. Please do not include costs to purchase or maintain a car or bicycle if they are part of your commute.

*Please provide the amount as a daily, weekly, monthly or annual cost; whichever is easier.*

{SINGLE + NUMERICAL RESPONSE}

#015 015Costofcommute#

Allow respondent to provide numerical response to 1 option only]

Daily	01	[Allow numerical response] [Show AUD]
Weekly	02	[Allow numerical response] [Show AUD]
Monthly	03	[Allow numerical response] [Show AUD]
Annual amount	04	[Allow numerical response] [Show AUD]

## ALL USERS

<ASK ALL>

**Q18.** Do you have access to end of trip facilities at your place or work or study?

*End of trip facilities are designated places that support cyclists, joggers and walkers in using alternative ways to travel to work rather than driving or taking public transport. Facilities include but are not limited to secure bicycle parking, locker facilities and change rooms.*

{SINGLE}

#018 018 Endoftripfacilities#

Yes <a href="#">ASK Q18A AND Q18B</a>	01
No <a href="#">GO TO Q19</a>	02

**Q18A.** Now thinking about the quality of those facilities, how would you rate them?

Extremely poor quality										Extremely good quality
0	1	2	3	4	5	6	7	8	9	10

**Q18B.** And now thinking about the quantity of those facilities compared to how many people use them, how would you rate them?

Too few facilities					The right amount of facilities					Too many facilities
0	1	2	3	4	5	6	7	8	9	10

## SECTION 3: CURRENT TRANSPORT PREFERENCES

<ASK ALL>

**Q19** In an ideal world, what transport mode would you use for your daily commute?

{SINGLE RESPONSE}

#Error! Reference source not found.19 Error! Reference source not found.19 Idealmode#

Car	01
Train	02
Bus	03
Cycle	04
Walk	05
Other ( <a href="#">Please specify</a> )	98

<ASK ALL>



**Q20** Why is [INSERT MODE from Q19] your most preferred transport mode? Please write as much detail as possible in the space below.

{OPEN RESPONSE}

#Error! Reference source not found.20 Error! Reference source not found.20 Whyideal#

<ASK ALL AND IF Q19 DOES NOT = SQ12>

**Q21** And what is stopping you from using [INSERT MODE from Q19] as your main transport mode now? Please write as much detail as possible in the space below.

{OPEN RESPONSE}

#Error! Reference source not found.21 Error! Reference source not found.21 Whynot#

## SECTION 4: STATED MOTIVATIONS AND PERCEPTIONS

<ASK ALL>

**Q22** Thinking about your daily commute, how stressful or relaxing do you consider it?

{SINGLE RESPONSE}

#Error! Reference source not found.22 Error! Reference source not found.22 Relaxing#

Extremely stressful					Neither stressful nor relaxing					Extremely relaxing
0	1	2	3	4	5	6	7	8	9	10

<ASK ALL>

**Q23** And still thinking about your commute over the last 12 months, do you feel it has gotten better, worse or stayed the same?

{SINGLE RESPONSE}

#Error! Reference source not found.23 Error! Reference source not found.23 Betterworse#

A lot worse					Stayed the same					A lot better
0	1	2	3	4	5	6	7	8	9	10

**Q23A.** And what has made your commute worse?

ASK IF Q23= 0 - 4

**Q23B.** And what has made your commute better?

ASK IF Q23= 6 - 10

<ASK ALL>

**Q24 A.** Why do you use [INSERT MODE from SQ12] as your main mode of travel?  
 {MULTIPLE RESPONSE}  
 #Error! Reference source not found.24 Error! Reference source not found.24 Reasonformainmode#  
 <LIST FOR WALKERS AND CYCLISTS>  
 RANDOMISE ORDER

It's convenient	01
It's cost efficient	02
It provides health benefits	03
I enjoy it	04
It's less stressful than other options	05
It's faster than other options	06
It's environmentally friendly	07
I have no other viable option	08
Other (Please specify)	98

**Q24B.** <LIST FOR CAR USERS>  
 RANDOMISE ORDER

It's convenient	01
It's cost efficient	02
My health or mobility prevents me using another mode of transport	03
I enjoy it	04
Less stressful than other options	05
It's faster than other options	06
I need to use my car at work/study	07
I carpool	08
My work supplies me with a car	09
Public transport is unavailable or inaccessible	10
It gets me closer to my destination than other options	11
No other viable option	12
Not enough parking at train stations	13
Other (Please specify)	98

**Q24C.** <LIST FOR BUS AND TRAIN USERS>  
 RANDOMISE ORDER

It's convenient	01
It's cost efficient	02
My health or mobility prevents me using another mode of transport	03
I enjoy it	04
Less stressful than other options	05
It's faster than other options	06

It's environmentally friendly	07
I don't have access to a car	08
I can avoid the hassle of car parking	09
I live or work close to public transport	10
Public transport arrives closer to my destination than other options	11
My employer or student status gives me access to cheaper public transport	12
I have no other viable option	13
Other (Please specify)	98

<ASK IF Q24 = MULTIPLE OPTIONS; IF Q24=SINGLE OPTION, AUTOPUNCH Q25 AS THAT OPTION>

**Q25** And what is the main reason you choose [INSERT MAIN MODE from SQ12]?

{SINGLE RESPONSE}

#Error! Reference source not found.25 Error! Reference source not found.25 Mainreason#

[ONLY SHOW OPTIONS SELECTED AT Q24; FOR OPTIONS NOT SELECTED AT Q24, AUTO PUNCH AS NOT SELECTED HERE]

xx	01
xx	02
xx	03
xx	04
xx	05
Other (Please specify)	98

<ASK OF CAR USERS>

**Q26** Why do you not use public transport or active transport (walking or cycling) to get to [AUTOFILL from SQ3]? Please write as much as possible in the space below.

{OPEN RESPONSE}

#Error! Reference source not found.26 Error! Reference source not found.26 Whynotpublictransport#

<ASK OF CAR USERS>

**Q27** From the list below, what are the biggest frustrations you encounter on your daily commute? Please select as many items from the list as apply to you.

{MULTIPLE RESPONSE}

[\[Randomise order\]](#)

#Error! Reference source not found.27 Error! Reference source not found.27 Frustrations#

Congestion	01
Road rage	02
Roadworks	03
Safety concerns	04
Poor quality roadways	05
Poor lighting	06
Lack of parking at your final destination	07
Cost of commute	08
Other ( <a href="#">Please specify</a> )	98
None of the above	99

<ASK OF BUS OR TRAIN USERS>

**Q28** From the list below, what are the biggest frustrations you encounter on your daily commute? Please select as many items from the list as apply to you.

{MULTIPLE RESPONSE}

[\[Randomise order\]](#)

#Error! Reference source not found.28 Error! Reference source not found.28 Frustrations#

Safety concerns	01
Insufficient parking at station	02
Overcrowded public transport	03
Unreliable public transport (e.g. late or cancelled services)	04
Congestion	05
Time taken to complete journey is too long	06
Time taken to complete journey varies too much	07
Cost of commute	08
Difficulty accessing public transport (i.e. getting to the bus stop or train station)	09
Other ( <a href="#">Please specify</a> )	98
None of the above	99

<ASK OF WALKERS OR CYCLISTS>



**Q29** From the list below, what are the biggest frustrations you encounter on your daily commute? Please select as many items from the list as apply to you.

{MULTIPLE RESPONSE}

[Randomise order]

#Error! Reference source not found.29 Error! Reference source not found.29 Frustrations#

Safety concerns	01
Poor lighting	02
Lack of end of trip facilities	03
Poor quality cycleways	04
Lack of cycleways	05
Poor quality walkways	06
Lack of walkways	07
Other (Please specify)	98
None of the above	99

<ASK ALL>

**Q30** What could be done to improve your daily commute? *Please write as much detail as possible in the space below.*

{OPEN RESPONSE}

#Error! Reference source not found.30 Error! Reference source not found.30 Improvement#



## SECTION 5: CHOICE SCENARIOS

### <ASK CAR SAMPLE 2 AND CAR SAMPLE 3>

In the next part of the survey we will be presenting you with transport options with different characteristics.

The purpose of this part of the survey is to better understand possible transport options and how to improve transport for the community.

### [NEW SCREEN]

We are going to show you different transport scenarios for travelling to work or study.

For each scenario you will be shown three transport options:

- Travel by car

### <SHOW TO CAR SAMPLE 2 >

- Travel by bus
- Travel by other means like train, ferry, cycling or walking

The features of the car option and the features of the bus option will change across scenarios.

### <SHOW TO CAR SAMPLE 3 >

- Travel by train
- Travel by other means like bus, ferry, cycling or walking

The features of the car option and the features of the train option will change across scenarios.

### <SHOW CAR SAMPLE 2 AND CAR SAMPLE 3>

For each scenario, you need to click on the transport option that you would prefer to travel to work or study.

Please read the options carefully and respond as best as you can.

[NEW SCREEN]

For each scenario, the transport options will be described using the following features:

The car option is described by **journey time** and the **cost to commute by car**.

<SHOW TO CAR SAMPLE 2 >

The bus option is described by journey time and frequency of service

<SHOW TO CAR SAMPLE 3 >

The train option is described by journey time and availability of car parking at the station

Car journey time	Average time it takes you to commute to work or study <b>one way</b> .
Cost to commute by car	Average daily cost to commute to work or study including parking and petrol but not including the cost to purchase or maintain your vehicle
<SHOW TO CAR SAMPLE 2 > Bus journey time	The time taken to travel by bus from your nearest bus station to your destination for work or study
<SHOW TO CAR SAMPLE 2 > Bus frequency	The time it takes from arriving at the bus stop to getting on your bus
<SHOW TO CAR SAMPLE 3 > Train journey time	The time taken to travel by train from your nearest train station to your destination for work or study
<SHOW TO CAR SAMPLE 3 > Train station parking	Guarantee of carpark at the train station for a fee of \$5 per day or no guarantee of parking spot

<SHOW TO CAR SAMPLE 2 >

If you need a reminder of each descriptor when looking at scenarios, hover your mouse over the car or bus label of each transport option.

<SHOW TO CAR SAMPLE 3 >

If you need a reminder of each descriptor when looking at scenarios, hover your mouse over the car or train label of each transport option.

[NEW SCREEN]

[NOTE RESPONDENTS WILL BE PRESENTED THREE OPTIONS: CAR IS ALWAYS THE ONE ON THE LEFT THEN BUS FOR CAR SAMPLE 2 OR TRAIN FOR CAR SAMPLE 3, THEN THE OTHER MEANS OPTION]

[RESPONDENTS WILL BE PRESENTED:

- FIRST WITH CHOICE SET # 1
- THEN A RANDOM SELECTION OF 7 SETS OUT OF SETS 2 TO 12 – REFER TO SEPARATE EXCEL SPREADSHEET FOR ALL THE SETS FOR CAR SAMPLE 2 OR CAR SAMPLE 3

RECORD ORDER OF SETS AS THEY ARE PRESENTED]

TEXT BEFORE EACH SCENARIO:

Thinking about your next commute to work or study, if these were the transport options available to you, which option would you prefer?

[CHOICE SETS FOR CAR SAMPLE 2 LOOK LIKE BELOW

CHOICE SETS FOR CAR SAMPLE 3 SHOWS CAR THEN TRAIN THEN BUS/FERRY/CYCLING/WALKING]

Car	Bus	Other means like train, ferry, cycling or walking
Car journey time is X minutes one way	Bus journey time is Z minutes one way	
The cost to The cost to is Y dollars per day	Guaranteed of getting a bus within 15 minutes	

## SECTION 6: FUTURE TRANSPORT PREFERENCES

<ASK ALL>

**Q31** How effective do you believe each of the following transport solutions will be in meeting Perth's future transport needs?

{SINGLE RESPONSE}

#Error! Reference source not found.31 Error! Reference source not found.31 Effectiveness#

Randomise order of solutions shown]

[Scale:]

Extremely ineffective										Extremely effective
0	1	2	3	4	5	6	7	8	9	10

[Solutions:]

Increasing the public transport services available	01
Making better use of our existing public transport routes (i.e. adding more services to existing routes)	02
More park and ride spaces	03
Building more or widening roads	04
Making better use of existing roads (i.e. by implementing technology)	05
Better cycling infrastructure including high quality cycle paths and end of trip facilities	06
Improved pedestrian pathways/access	07
Further restricting car parking in areas like the CBD	08
Providing more parking in areas like the CBD	09
Charging more for parking in areas like the CBD	10
Charging motorists to use the most congested roads at peak periods	11
Charging motorists more to use the most congested roads at peak periods if they have only one person in the car	12
Encouraging and enabling more people to travel at times outside peak periods (i.e. staggering school or business hours)	13
Encouraging and enabling school children to travel by walking, cycling or public transport	14
Providing incentives for people to travel by public transport, walking and cycling	15
Improving access to information on road conditions, congestion and alternative routes to avoid congestion	16
Encouraging the use of new or alternative vehicles like electric bikes	17
Enabling more people to live close to work (i.e. more housing close to major employment centres)	18
Enabling more people to live close to major public transport infrastructure (i.e. more housing next to railway stations)	19
Increasing the number of jobs in suburban centres outside the CBD to reduce travel distances	20
Introducing car sharing schemes (car rental schemes which enable people or businesses to rent easily accessible cars for short periods of time i.e. as short as one hour)	21

<ASK ALL>

**Q32.** Listed below are five public transport initiatives that could be invested in for Perth's future needs. What level of priority do you believe each should be given by the State Government?

Please rank the five initiatives from 1 to 5 with the first being the one you believe should have the highest priority down to the fifth which you believe should be the lowest priority. Clicking on the initiative on the left will move it across to the box on the right. Click on the first priority first, and then the second and so on. You can edit the order of the initiatives using the buttons on the right.

{SINGLE RESPONSE}

#Error! Reference source not found.32 Error! Reference source not found.32 Priority#

[Randomise order of initiatives shown]

[Initiatives:]

New outer suburban heavy rail lines	01
New inner and middle suburb heavy rail lines	02
New light rail to move people in middle and inner areas	03
New rapid bus routes to move people in inner and middle suburbs	04
Rapid ferry services on the Swan River	05

<ASK ALL>

**Q33** Are there any other initiatives not listed above that you believe should be a priority for Perth's public transport in the future?

{OPEN RESPONSE}

#Error! Reference source not found.33 Error! Reference source not found.33 Otherinitiatives#



## SECTION 7: DEMOGRAPHICS

<ASK ALL>

**D1** Which of the following best describes the type of work you do?

{SINGLE RESPONSE}

#D1 D1 Typeofwork#

Manager	01
Professional	02
Technician or trade worker	03
Community or personal service worker	04
Clerical or administrative worker	05
Sales worker	06
Machinery operator or driver	07
Labourer	08
Student	09
Prefer not to answer	99

<ASK IF SQ3 = 01>

**D2** On average, how many hours do you work each week?

{NUMERICAL RESPONSE}

#D2 D2 Hoursworked#

[Allow numerical values] [Show label as "hours"]

<ASK IF SQ4 = 01>

**D3** On average, how many hours do you attend educational classes each week?

{NUMERICAL RESPONSE}

#D3 D3 Hoursstudied#

[Allow numerical values] [Show label as "hours"]

<ASK ALL>

**D4** Which of the following best describes your current situation?

{SINGLE RESPONSE}

#D4 D4 MaritalStatus#

Married	01
Living together	02
Single	03
Widowed	04
Divorced	05
Separated	06
I'd rather not say	99



<ASK ALL>

**D5** How many children aged 16 or under are there in your household?

{SINGLE RESPONSE}

#D5 D5 Numberofchildren#

0	01
1	02
2	03
3	04
4	05
5	06
6	07
7	08
8	09
9+	10

<ASK IF D5 = 02 to 10>

**D6** And what are the ages of the children in your household?

{MULTIPLE + NUMERICAL RESPONSE}

#D6 D6 Agesofchildren#

1 year or younger	01	[Allow numerical value to record number of children this age]
2 years	02	[Allow numerical value to record number of children this age]
3 years	03	[Allow numerical value to record number of children this age]
4 years	04	[Allow numerical value to record number of children this age]
5 years	05	[Allow numerical value to record number of children this age]
6 years	06	[Allow numerical value to record number of children this age]
7 years	07	[Allow numerical value to record number of children this age]
8 years	08	[Allow numerical value to record number of children this age]
9 years	09	[Allow numerical value to record number of children this age]
10 years	10	[Allow numerical value to record number of children this age]
11 years	11	[Allow numerical value to record number of children this age]
12 years	12	[Allow numerical value to record number of children this age]
13 years	13	[Allow numerical value to record number of children this age]
14 years	14	[Allow numerical value to record number



		of children this age]
15 years	15	[Allow numerical value to record number of children this age]
16 years	16	[Allow numerical value to record number of children this age]

<ASK IF D5 = 02 to 10>

**D7** And are you responsible for transporting children to and/or from school or other activities on a regular basis?

{SINGLE RESPONSE}

#D7 D7 Responsiblefortransport#

Yes	01
No	02

<ASK ALL>

**D8** Which of the following best describes the hours that you most often commute for work or study?

{SINGLE RESPONSE}

#D8 D8 Commute hours#

Within traditional peak hours (e.g. 7am - 9am and 4.30pm - 6.30pm)	01
An earlier start and finish (e.g. 5am - 7am and 2pm-4pm)	02
A later start and a later finish (e.g. 10am-11am and 6.30pm - 7.30pm)	03
Other (Please specify)	98

<ASK ALL>

**D9** Which of the following best describes your annual household income before tax?

{SINGLE RESPONSE}

#D9 D9 Income#

Less than \$20,000	01
\$20,001 - \$50,000	02
\$50,001 - \$75,000	03
\$75,001 - \$100,000	04
\$100,001 - \$125,000	05
\$125,001 - \$150,000	06
\$150,001 - \$200,000	07
\$200,001 - \$250,000	08
\$250,001 - \$300,000	09
More than \$300,001	10
I'd rather not say	99

<ASK ALL>

**D10** Which of the following have you done comfortably in the last four weeks?

{MULTIPLE RESPONSE}

#D10 D10 Fitness#

Walked continuously to get from place to place for at least <b>10 minutes</b>	01
Walked continuously to get from place to place for at least <b>15 minutes</b>	02
Walked continuously to get from place to place for at least <b>20 minutes</b>	03
Walked continuously to get from place to place for at least <b>25 minutes</b>	04
Walked continuously to get from place to place for at least <b>30 minutes</b>	05
Walked continuously to get from place to place for <b>more than 30 minutes</b>	06
None of the above	99

<ASK ALL>

**D11** Thinking about everyone that makes up your household, how many vehicles are owned by your household in total?

{SINGLE RESPONSE}

#D11 D11 Vehicles#

None	01
1	02
2	03
3	04
4	05
5	06
More than 5	07

<ASK ALL>

**D12** Do you hold a current Australian driver's licence?

{SINGLE RESPONSE}

#D12 D12 Licence#

Yes	01
No	02

**Standard Thank and Close**

**Re-direct to Committee for Perth home page**

## Appendix 3: Business Interview Questions



### Committee for Perth - Get a Move On Discussion Guide General Businesses

#### Interview Details

Consultant	Date	Time	Stakeholder Details (name, company, address/phone)	Phone or F2F

#### Objectives

1. Impact of Congestion	2. Impact on Business Location	3. Supported Solutions	4. New Innovative Solutions
Identify the impact of congestion on businesses, including: <ul style="list-style-type: none"><li>Productivity impacts</li><li>Direct cost impacts</li><li>Quality of life impacts for staff</li></ul>	Identify the transport and housing factors that contribute to businesses being located in certain parts of Perth.  Identify what conditions would make them relocate?	Identify the transport and infrastructure solutions that businesses support.	Identify new innovative solutions that organisations have implemented to reduce the impacts of congestion.

*NOTE: The discussion document is a guide and not a rigid set of questions. The moderator's style is not to go through the guide question by question, but to ensure the desired information is gained from the interview, to address the key objectives of the research.*



## 1. Introduction

(6 minutes)

Moderator Introduction:

- Thank business for their time
- Introduction to Ipsos - we are an independent market research company
- Briefly explain the purpose of the interview: To understand and explore the impact of traffic and congestion on your business
- All responses are completely confidential
- We want to hear your honest opinions – please don't hold back! There are no right or wrong answers
- Audio recording
- Interview should last around 45 to 60 minutes

Understanding the business:

- To get started, it would be great if you could tell me a bit about your business:
  - What the business does
  - Number of employees
  - How many offices in Australia, in Perth and where located
  - Your role in the business
  - How long you have been in your role

## 2. Detailed Locational Requirements

(20 minutes)

**Aim: To understand the organisation's specific locational requirements and what factors are given what weight when making decisions about where to locate.**

- What would you say is the best thing about being in this location?
  - IF CBD LOCATION: What do you see as the main benefits of being located in the CBD?
  - IF INNER AREAS LOCATION: What do you see as the main benefits of being located in the inner areas of Perth?
  - IF OUTER LOCATION: What do you see as the main benefits of being located in the outer areas of Perth?
  - Do you think your employees would say the same thing or something different?
- And what would you say is the worst thing about being in this location?
  - IF CBD LOCATION: What do you see as the main challenges of being located in the CBD?
  - IF INNER AREAS LOCATION: What do you see as the main challenges of being located in the inner areas of Perth?
  - IF OUTER LOCATION: What do you see as the main challenges of being located in the outer areas of Perth?
  - Again, would your employees say the same thing or something different?

- What do you think are the pros and cons of CBD location versus other locations in metropolitan activities centres, in the central sub-region; or outer/suburban locations?

**Central sub-region:**

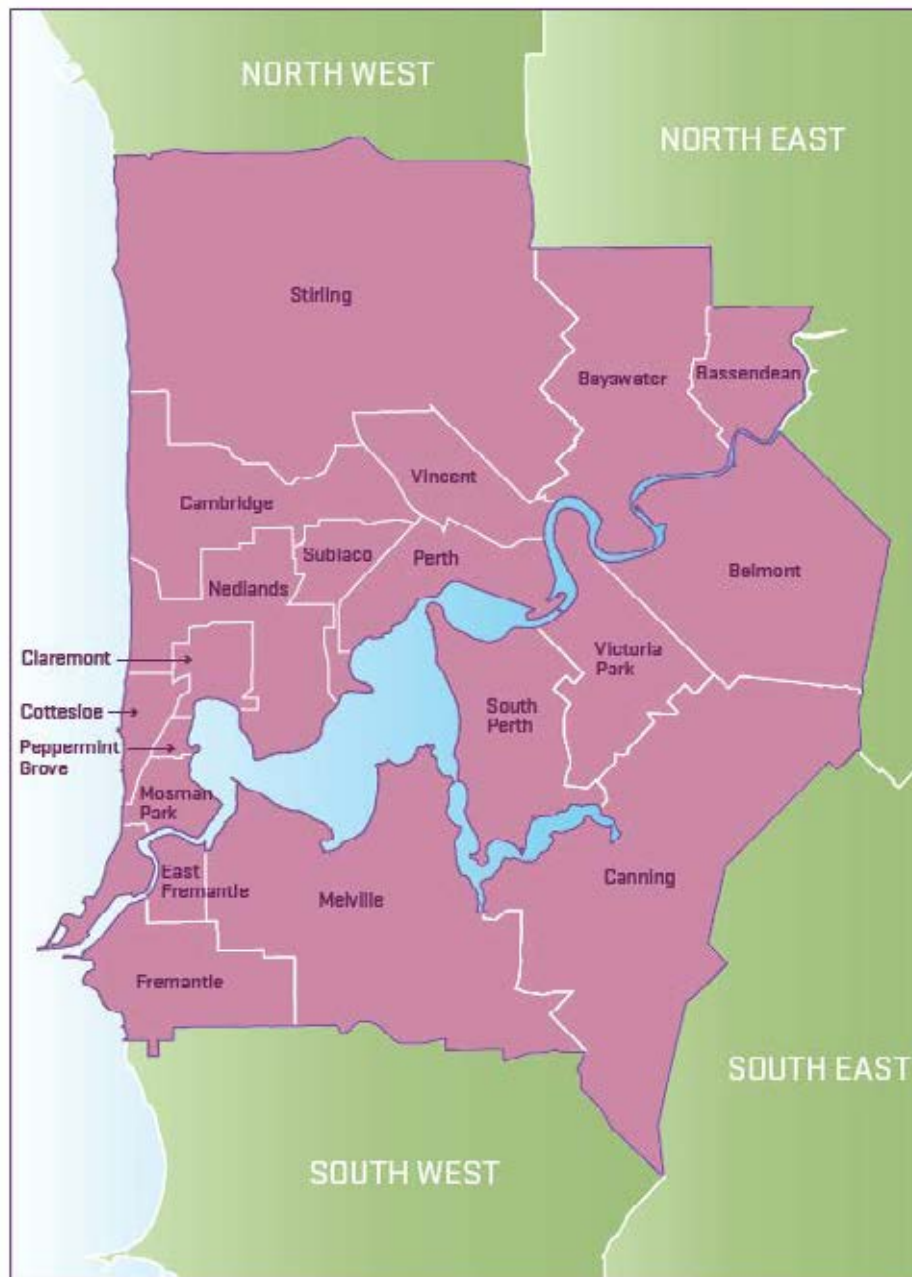


FIGURE 2: LOCAL GOVERNMENT AUTHORITIES IN THE CENTRAL SUB-REGION





**Cannington:** Cannington is predominantly a retail shopping centre with a mix of bulky goods retail, showroom and commercial activity extending north-west and southwest along Albany Highway. Planning is underway to redefine the centre, consolidate and diversify the land use mix and better integrate the centre with Cannington train station.

**Fremantle:** Fremantle is already a highly diverse centre with a strong heritage and cultural identity as a port city and the site of first colonial settlement. Fremantle is a recognised tourism and entertainment destination and home to important institutional facilities. Continued growth and development of the centre will need to be balanced against the heritage and cultural features that give Fremantle its recognisable character.

**Morley:** Morley is distinct from other strategic regional city centres in that it is not connected to the metropolitan passenger rail network. It is serviced by high frequency bus routes and a bus transfer station. Morley is predominantly a retail centre but will be encouraged to become more diverse over time by providing greater housing and employment opportunities.

**Stirling:** Stirling city centre was historically developed as a general and light industrial area and has evolved over time to become a major regional destination for bulky goods retailing and, more recently, commercial and office development. The Stirling Alliance has been formed by key stakeholders to re-plan the centre, improve its integration with the passenger rail network, and reduce the current level of car dependency. It is anticipated that Stirling will ultimately develop to complement Perth as a major employment centre and will become more diverse with the progressive introduction of housing and associated social infrastructure.

**NOTE FOR NEXT SECTION: If participant is unable to reflect upon the actual decision to locate in current premises, ask to think about what they would do if they had to move from their current location.**

- Now I'd like to talk in more detail about where your business is located and why. Can you tell me how long you've been in this location?
- And can you tell me about the decision making process around choosing this location? IF NOT INVOLVED IN PROCESS, PROBE RE WHAT THEY KNOW ABOUT IT, WHAT WOULD HAVE BEEN CONSIDERED ETC. OR WHAT THE PROCESS WOULD BE IF THEY WERE FACED WITH RELOCATING NOW.
  - Let's start with the decision to be in this general area – that is, this part of Perth
    - What factors were important in deciding to be in this location?
      - What were the must haves?
      - And what were the nice to haves?
    - Were any alternative locations considered? IF YES, why were they ruled out? IF NO, why was this the only area considered?
    - What are all the variables you would consider in choosing a location? Note: Make a list then discuss each variables and criteria relevant under each.
    - Thank you, you've covered some of my list. I now want to just ask you if some other factors would be considered. PROBE ON THE IMPORTANCE/ CONSIDERATION OF THOSE NOT MENTIONED:
      - Cost (direct costs i.e. rent and indirect costs such as congestion, travel distances, access to employees and other businesses)
      - Availability of suitable commercial space
      - Capacity for expansion
      - Prestige
      - Proximity to competitors
      - Price
      - Ease of access for clients/customers
      - Ease of access for employees
      - Links to transport (road, PT and AT)
  - And now what about this specific building?
    - What factors were important in deciding on the actual building?
      - What were the must haves?
      - And what were the nice to haves?
    - Were any alternative buildings considered? IF YES, why were they ruled out? IF NO, why was this the only building considered?
    - IF NOT MENTIONED PROBE ON THE IMPORTANCE/ CONSIDERATION OF:
      - Cost (direct costs i.e. rent and indirect costs such as congestion, travel distances, access to employees and other businesses)
      - Prestige
      - Capacity for expansion
      - Proximity to competitors



- Amenity to transport (road, PT and AT)
- Car parking (for employees as well as clients)
- End of trip facilities
  
- Just to summarise what we've discussed, when it comes to your business' locational requirements, that is, deciding where to locate your business it sounds like the most important factors were [PARAPHRASE WHAT'S BEEN DISCUSSED], have I missed anything?
  
- Taking everything into consideration (current leases arrangements, the commercial leasing environment in Perth, availability of space, business performance etc.) how likely is your business to relocate in the next 12 months? 2-5 years? 10 years?
  - IF YES: What are the main reasons pushing you to consider relocating?
    - And where would you consider relocating to?
      - New location or just a different building in the same location?
    - What factors would be important in deciding where to relocate to?
    - Are there any areas (within reason) that you would not consider relocating to?
      - PROBE ON SOME RELEVANT ACTIVITY CENTRES:
        - Joondalup
        - Armadale
        - Midland
        - Osborne Park/Stirling
        - Cannington
        - Rockingham
        - Fremantle
        - Morley
        - Mandurah
  - IF NO: What is stopping you from considering to relocate? PROBE TO UNDERSTAND IF IT IS DUE TO SATISFACTION WITH CURRENT LOCATION OR OTHER FACTORS STOPPING THEM FROM BEING ABLE TO RELOCATE.
  
- What are the areas that you WOULD consider relocating to?
  
- And if I had asked you this question 12 months ago, would your answer have been different? PROBE TO UNDERSTAND IF RECENT ECONOMIC DOWNTURN HAS CHANGED DECISIONS TO RELOCATE (E.G WERE PLANNING TO EXPAND BUSINESS, NO NEW SPACE AVAILABLE THEN BUT MORE NOW ETC.)

### 3. Impact of Congestion on Business

(12 minutes)

**Aim: To understand how relevant congestion is as a business concern**

**I'd now like to talk of ease of getting around. How do you find Perth and the ease of getting to and from work?**

- What are your perceptions of congestion in Perth generally?
  - Would you say it is better or worse than other capital cities in Australia?
  - And has congestion generally gotten better or worse in Perth in the last 12 months? Last 5 years?
- And what about in the general area where you're located?
  - Would you say it is better, worse or about the same as the rest of the metro area?
  - And has congestion generally gotten better or worse in your location in the last 12 months?
- And what about your specific building, how is it impacted by congestion?
  - Is it better or worse than other buildings nearby?
- Does congestion have an impact on your business? If yes, how?
  - IF NOT MENTIONED PROBE ON:
    - Have you ever calculated the financial cost of congestion to your business?
    - Productivity impacts
      - Is congestion impacting productivity?
    - Direct cost impacts
      - Are your clients/customers able to get to you easily?
    - Quality of life impacts for staff
      - Are your staff able to get to work easily?
      - Are they often late due to traffic? Trying to find parking?
      - Are they able to access alternative modes of transport such as PT and AT?
- How important do you feel congestion is to your employees? Is it something that worries them on their commute and impacts their overall wellbeing at work? Or is it not a significant issue?
  -
- Typically, how do your employees get to and from work?
  - IF NOT MENTIONED PROBE RE:
    - Could you say how many drive? Catch the train? Catch the bus? Walk or cycle?
    - Could you say how many have flexible work hours/capacity to travel outside peak periods?
  - Do you offer any employees onsite car parking?
    - IF YES: What offered, how many, at what cost etc.
    - IF NO: Has there been demand for this from employees? Has it ever been considered?
  - Do you offer offsite car parking?
    - IF YES: What offered, how many, at what cost etc.
    - IF NO: Has there been demand for this from employees? Has it ever been considered?
  - Do any of your employees have company vehicles?
    - IF YES: How many and what are the arrangements re parking, use on weekends etc.

If parking and company vehicles are provided, do employees with parking and vehicle arrangements need to regularly use their car during the day for work purposes?

- Do you provide end of trip facilities?
  - IF YES: What is the quality and quantity of the offer?
  - IF NO: Has there been demand for this from employees? Has it ever been considered?

#### 4. Support for Proposed Strategies

(10 minutes)

**Aim: To understand use of strategies/incentives now and support for new alternatives.**

- Does it matter in any way to your company how your employees get to and from work? Do you try and encourage any particular mode of transport?
- Does your business offer any incentives around how employees travel to and from work?
  - E.g. Discounted PT or provision of SmartRiders?
  - Salary packaging of company vehicles or car parking?
  - Cash in place of vehicle allowances?
  - IF YES: What was the objective behind introducing these initiatives? Has it been achieved?
  - IF NO: Would the business consider any of these types of incentives in the future?
- Does your business support flexible work arrangements?
  - E.g. Staggered start and finish times to avoid peak hour commute?
  - Working remotely when possible?
  - IF YES: What was the objective behind introducing these initiatives? Has it been achieved?
  - IF NO: Would the business consider any of these types of incentives in the future?
- Now, I'd like to show you some potential strategies that could be implemented to reduce Perth's dependence on cars for daily commutes to work or study. I'd like you to tell me how effective you believe each would be and if you would support it being implemented.
  - Value capture models: *Public investments, such as building transportation can increase adjacent land values, generating an unearned profit for private landowners. The unearned value (increases in land value which otherwise profit private landowners cost-free) may be "captured" directly by converting them into public revenue through a tax, levy or similar.*
  - Congestion charges: *Introduce road users charging on major roads with heaviest congestion levels during peak hours.*
  - Increased parking costs
  - Reduced availability of car parking in central areas (both via public car parks and private parking in commercial buildings)
  - Increased investment in public transport (expanding services, new routes, new modes of transport etc.)



- Employment decentralisation: *The purpose of this policy is to move employment out of the CBD and into suburban locations so that people have access to jobs close to where they live and may not need to travel as far to their place of employment.*
- Increasing residential density surrounding activity centres and PT nodes.
- Discouraging car use through cost disincentives: *This could be disincentives such as changes to fuel pricing policies, taxes on second vehicles, changes to fringe benefits, tax arrangements for cars or car parking provided by an employer.*
- Technology: *such as intelligent transport systems and more real time information to improve road efficiency.*

And can you think of any strategies or initiatives that we haven't discussed that you believe may be effective in reducing car dependence in Perth?

#### 5. Thank and Close

(2 minutes)

- Is there anything we haven't covered in relation to congestion in Perth and its impact on your business or where it is located, that would like to discuss?
- Thank you very much for your time.

## Appendix 4: The Findings

### Travel Distance, Mode Choice and Employment Locations

The distances people commute between home and work have increased.

The popularity of private car for travel is evident around the world, including in the United Kingdom and the United States.

Cars are convenient and flexible and the freedom they provide strongly appeals to people.

The dispersal of employment into low-density areas means that a lot of people have no viable transport alternative.

Commuting has become more complex. Origins and locations have become more dispersed, working hours and conditions have become increasingly variable, the number of workers per household has grown and trips are multi-purpose.

Historic underinvestment in public transport systems has increased the appeal of car today.

### Commuting in the USA

Increases in commuting in the USA are linked to population growth and despite initiatives to increase vehicle occupancy, car-pooling has declined.

Working from home has increased and similar proportions of people in the United States work from home as use public transport to travel to work.

Public transport is more popular among lower income earners.

People who live in suburban locations have higher rates of car commuting compared to people living within the principal cities.

Ethnicity has a significant impact on commuting choice in the United States with white Americans significantly more likely to drive.

### Commuting in the UK

The ageing of the population has reduced the proportion of commuting trips in the UK.

Rail is popular for journeys over longer distances (accounts for 30% of journeys of 80km or more) in the UK.

People travel further to access higher paying jobs.

In the UK, London is in a league of its own in terms of public transport mode share and this has been reinforced through sustained investment in public transport.

### Trends Influencing Transport

Transport decisions and planning need to reflect economic, demographic, land use and social trends and therefore cannot be developed in a silo.

### Peak Car

Do not get carried away with 'peak car' as a congestion solution because even if vehicle kms travelled per person decrease, population growth will still result in more cars on the road.

If trends such as 'peak car' are observed in Perth it will lead to an increased need for public transport investment.

### Working from Home

Working from home has the potential to reduce commute trips – although these people often make other trips on the road network at all times during the day.



## Technology

Drivers are often unaware of the alternative mode choices available to them.

Smart phone apps are emerging as important tools to shape travel patterns and influence mode choice by providing information and incentives for non-car travel.

Technology has enabled public transport travel time to become productive time.

Technology has the capacity to make transport systems run more efficiently.

There are many complexities associated with the use of driverless cars and we should not expect them to be a 'magic bullet' in regards to transport efficiency.

Strategic investment in non-car modes and the promotion of alternative modes will continue to be necessary as regions grow.

## Institutional and Policy Considerations

Cities need appropriate institutional arrangements in that key areas such as transport, land use planning, economic development and the like are under the control of one body.

Cities need funding mechanisms to support strategic investment.

A 'competent technocracy' must be in place to oversee the implementation of schemes and projects.

## Strategic Land Use and Transport Planning Framework

Five major land use strategies have been prepared for Perth and Peel over the past 60 years. Plans and strategies for road and public transport have primarily been prepared as separate documents.

The relationship between transport, land use and economic development is symbiotic and there is a need for land use and transport planning to be paired with a broad economic strategies for the region.

Of 13 major long term land use and transport objectives for Perth and Peel, four have been fully achieved. Objectives most difficult to achieve are those which aim to intervene in the market to influence the location of housing or employment.

Impediments to achieving strategic objectives include conflicts between core strategic objectives; community opposition; an increasingly fragmented governance framework at state and local level; and conflict between strategic planning objectives and market preferences.

Major investments in public transport infrastructure from 1990 to 2009 successfully increased public transport use and decreased vehicle dependence, however growth in public transport mode share has recently subsided.

A number of infrastructure proposals (including proposals for new public transport) incorporated in regional strategic plans have not been implemented.

There are more than 200 activity centres in Perth and Peel including 10 Strategic Metropolitan and 19 Secondary Centres. The decentralisation of employment to a more dispersed pattern than was originally envisaged for the region is reducing the potential for transport efficiencies.

Uncertainty associated with implementing infill and employment targets could reduce the effectiveness of long-term planning for transport infrastructure, which relies upon a detailed understanding of future residential density and employment patterns.

## Commute Times and Distances

Commute distances in Perth and Peel appear to be increasing and are longest for people who live in outer locations and/or work in outer locations.

As the population of the region grows, travel behaviour and land use patterns will need to adapt so that commute distances and times can remain within a reasonable limit/do not increase exponentially.

### Population and Employment Densities

Patterns of population density in Perth and Peel have become more dispersed over time, with areas of relatively high population densities in some outer locations and lower population densities in some central locations. Outer locations are more likely to be car dependent.

People are more likely to use public transport if they live in an area with high population densities, particularly if the area is centrally located.

Commuters who use public transport are more likely to work in an employment area with high employee densities, and that is also home to tertiary employment sectors.

Employment in Perth and Peel is centralised, yet is relatively low-density, meaning that there are few nodes with adequate employment and population densities to support public transport use. Locations that do have population and employment densities adequate to significantly reduce car dependence include Perth CBD, Osborne Park Industrial; Subiaco-Shenton Park; Mount Hawthorn-Leederville; Wembley-West Leederville-Glendalough, Nedlands-Dalkeith-Crawley and North Perth. Most of these areas have higher than average public transport use among residents or workers and may have capacity for car dependence to be further reduced.

### Patterns of Commuting

The Central sub-region is the primary commuting destination in Perth and Peel.

Most employment in Perth and Peel is located within the Central sub-region, but is relatively dispersed through the sub-region.

### Patterns of Employment and Economic Activity

Patterns of commuting to non-CBD employment locations reflect inward movements of commuters but also some cross-suburban commuting.

The Swan River appears to form a barrier to travel to non-CBD employment locations.

The Perth CBD and Subiaco-Shenton Park areas form the professional service sector and economic and productivity heart of Perth and Peel.

A strong diamond shaped corridor of economic activity and productivity is also evident between Fremantle; Osborne Park in the north; Perth airport in the east; and Murdoch in the south, forming the region's 'global economic jewel'.

### The Pull of Central Locations

Central locations and locations associated with major infrastructure have a strong 'pull' for tertiary employment, particularly for knowledge intensive professional service sector employers who gain major productivity benefits from locating in professional service sector agglomerations.

Economic activity and areas of high productivity are centralised and associated with transport infrastructure such as airports or ports.

The centralisation of economic activity brings costs and benefits with a key benefit being increased productivity.

Major tertiary employment centres are viable when associated with major transport infrastructure; when highly connected to existing CBD locations; and when located within 20km of the CBD. Access to a skilled workforce supports decentralised centres in Greater Sydney.

### Capacity for Strategic Knowledge Centres/Public Transport Destinations

Subiaco; Nedlands-Crawley (UWA and QEII); Curtin University/Bentley Technology Park; Murdoch; Fremantle; and Joondalup have been identified as activity centres to be developed as major knowledge/professional service sector employment locations and public transport destinations within a 20 year horizon.

### Access to Employment

Employment in Perth and Peel is currently relatively accessible compared to Sydney and Melbourne.

Access to employment by car and by public transport is highest to and from central locations and lowest from outer residential locations. Access to employment from outer residential locations is likely to decrease if residential development continues to be focused on outer suburban areas, while employment remains centralised.

### Infrastructure Pattern and Quality

The hub-and-spoke form of transport infrastructure in Perth and Peel reinforces Perth's centralised employment structure.

The provision of north-south infrastructure links have improved accessibility in the northwestern and southwestern corridors but has also helped to facilitate a linear form of population growth which is increasing possible commute distances and delivering transportation and accessibility challenges.

### Linear Outward Growth Patterns

Outward linear growth patterns increase total possible commute distances and reduce the resilience of existing transport infrastructure, particularly north-south links.

Outward growth patterns generate pressure for infrastructure investment to be focused on extending the transport system outwards (to service new fringe areas) rather than inward to deliver new infrastructure and services and improve capacity of the system in established areas that accommodate the majority of jobs and people and generate the bulk of public transport trips.

### Traffic Congestion

Traffic congestion in Perth and Peel is a major frustration for commuters but overall is not yet as big as an impediment to travel as congestion in Sydney and Melbourne. However, traffic congestion is significant on north-south freeway routes and is predicted to increase in the future without significant additional infrastructure investment.

### Skills Match

White collar workers are more likely to travel to central locations for work because this is where office, professional and clerical employment is located. Managers, professionals and clerical administration workers are most likely to live in the Northwest and Central sub-regions.

There is a need to match employment opportunities with the skills of local residents.

Central locations are most often identified as preferred areas to live but research indicates that there is inadequate housing diversity in these locations.

Two worker households mean that home and work choices have become more complex.

### Housing

There is a need for a substantial increase in the supply of semi-detached dwellings in inner suburban locations.

### Understanding Business Location Decisions in Perth and Peel

Despite decades of strategies that have sought to decentralise economic activity and employment in the Perth metropolitan region, businesses with a professional workforce continue to exhibit a preference for central locations.

Central locations deliver benefits for businesses including prestige; amenity; accessibility; proximity to clients and peers; premises that suit a large number of employees; and competitive rents, in the current market.

The types of business located in the CBD included resources, banking, financial and professional services, legal and government. A majority of these businesses would not consider moving out of the CBD, as the benefits of a central business district location outweigh the costs.

The radial structure of the transport system; the 'Swan River divide'; the need to access a large pool of skilled labour; and the lack of a clear second city, limit the ability for professional service sector businesses to move out of the CBD.

Businesses choose inner city locations because of accessibility to the CBD; access to car parking; amenity; and less congested freeway access points.

The types of business located within the inner city included developers, health services, junior mining firms and business services. Most inner city businesses would not consider moving further out from central Perth however some would consider moving closer to the CBD.

Inner suburban locations, within 15km of the CBD, offer affordability; capacity for purpose built premises; opportunity for local workers; and capacity to establish strong branding or culture.

Inner suburban businesses tend to have less need for direct client access and include technology, logistics, light industrial, property, architecture, education and health. Most said they would not consider further decentralisation, however some would like to move closer to the CBD.
Outer suburban businesses, greater than 15km from the CBD, chose to locate in these areas because they are near a specific industry in an industrial estate; provide the capacity for large premises; are more affordable; enable expansion; provide access to specific infrastructure; avoid inner congestion; and provide on-site parking.
The types of business located in these areas included freight, manufacturing, industrial, agriculture and government.
Businesses that indicated congestion is not an issue were: located in the CBD; located within close proximity of a train station; and professional service firms.
Businesses for whom congestion is an issue are suburban local governments with congestion hotspots; health and education institutions; and non-CBD businesses that rely on the road network for daily operations.
Businesses for whom congestion is an issue have identified specific strategies to reduce the impacts of congestion on their business.
Very few businesses understand how their employees commute.
Business policies and the actions of business leaders most commonly support and model car commuting. This is because there are perceived to be benefits for the business of employees having their cars at work.
Businesses are most likely to support strategies associated with improving the efficiency of the transport network and infrastructure investment. Specifically businesses believe that investment in the public transport system is needed before strategies for behaviour change will be effective.
Technology is strongly supported as a nimble, cost effective solution to improve transport planning and the efficiency of the existing system.
High residential densities, particularly in inner areas and around public transport nodes are strongly supported by businesses.
Support for decentralising professional service, science and technology jobs from the CBD into outer activity centres is low.
Businesses believe that if non-CBD activity centres are to be successful, fewer hubs are needed and transport investment needs to 'lead the charge'.
Support for strategies that aim to shift behaviour through disincentives is low.
<b>Benchmarking the Performance of Perth's Public Transport System</b>
The level of investment in operating services on Perth's network is quite low. However, Perth's sprawling suburban expanse makes building and operating lines expensive.
High train speeds on the Joondalup and Mandurah lines, designed to compete with the car, results in a lower number of trains required to operate them at a reasonable frequency compared to the older suburban railway lines.
Perth's rail network is operated at minimum 15-minute service frequencies seven days a week during the inter-peak period. This standard represents the best consistent service level found in any Australasian urban rail system, though in global terms it is relatively modest.
Perth's public transport network is relatively easy to move around in. This is due to the high speed and consistent 15-minute inter-peak and weekend daytime frequency of the train system, and the good integration between trains and buses. The key weakness is the relative lack of compact clusters of intense urban activity outside the centre of Perth.
The spacing and speed of the rail lines result in cross-suburban journeys from one rail corridor to another generally taking longer by the Circle Route than by a rail transfer trip through central Perth.
The transfer intensity of Perth's public transport network is average among Australasian cities. Long train lines from one end of the city to the other and the Circle Route bus reduce the need for transfers, while the configuration of many bus lines as feeders to train stations increases it.

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Public transport accessibility is poor in Perth compared to other Australasian cities. Perth only provides higher-frequency and full-time public transport within walking distance to less than half its residents and jobs.

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Perth's lower rail station density plays a role in limiting network coverage/accessibility by walking.

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The number of residents and jobs that can be reached within a public transport journey of 30 minutes or less is highest from the CBD (35%) and lowest from outer locations.

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Perth's public transport network is highly centralised: it primarily services the CBD area and channels many suburb-to-suburb journeys through the central city. However this means that Perth's public transport system is successful in channelling travel opportunities along the high-performance rail system.

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Perth's public transport network is currently comparatively resilient, however a continuing high rate of population growth will erode this advantage in the future without further substantial investment to increase the capacity in established and newly urbanised areas.

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Only residents in the very centre of Perth could reasonably rely on public transport to travel around the city.

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Perth's public transport system has an excessive emphasis on servicing the central city area, driven largely by efficiency and cost-minimisation goals.

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Improving the level of service provided by Perth's public transport system will require a shift to servicing a broader range of destinations. This includes the provision of orbital links and more high frequency direct connections between major activity nodes.

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#### Understanding Commuter Mode Choice in Perth and Peel

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Motivators for mode choice are relatively consistent among commuters but perceptions and experiences of transport convenience, speed, proximity and cost efficiency vary significantly from person to person depending on personal and work circumstances.

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The demographic and socio-economic characteristics of the commuter, as well as environmental factors including where the commuter works and the distance between their home and work location have a significant impact on mode choice.

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Convenience is a major motivating factor for all types of commuters but is a very strong motivator for car commuting and this is strongly associated with the flexibility of car.

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For train and bus commuters, convenience is associated with avoiding inconveniences and delays associated with driving on congested routes and finding car parking at their destination.

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#### Speed

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Speed is a crucial motivating factor for commuters and is a primary motivating factor for choosing to commute by car. Speed is also a motivator for train commuters.

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Car commuters motivated by speed are more likely to work in non-CBD locations.

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Car is faster than public transport for most journeys. Journeys that are most competitive with car are journeys that do not require commuters to cross the Swan River and transfer through the Perth CBD.

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Direct single mode train journeys are also likely to be competitive with car.

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Major employment destinations that are currently significantly slower to travel to by public transport than car are Curtin University, UWA/QEII, Osborne Park and Welshpool.

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Transfers and service frequencies are a substantial barrier to public transport use.

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#### Cost

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A significant proportion of commuters perceive car to be more cost effective than public transport, and a number of people expressly identify cost as a barrier to public transport use.

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Commuters who have access to free or low cost parking perceive car to be cost effective while commuters who pay for parking, particularly in the Perth CBD, are likely to perceive public transport to be a more cost-effective commuting option.

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## Health

Personal health is the primary motivator for active commuters, cyclists and walkers, and research indicates that active commuters do obtain very significant health benefits as well as reduced stress levels.

## Destination

Destination is a primary motivator for commuting via public transport and public transport users are most likely to work in the CBD.

Characteristics exhibited by effective public transport destinations are accessibility; barriers to car use; density (employment and residential); and opportunity.

## Home Location

Car commuters are more likely to live in outer locations than inner locations however they work in locations throughout the region.

The distance between home and work impacts on mode choice. Short commutes are significantly less likely to be undertaken by car.

Train is more popular for longer commutes, while bus, walking and cycling are favoured for shorter commutes. Bus commuters, walkers and cyclists are likely to live within approximately 11 km of the Perth CBD.

Commuters who live in a location from which their work destination is accessible within a 60-minute public transport commute are more likely to choose public transport for commuting purposes.

Bus commuters are most likely to live within 1km of a bus service that links them with their destination with an average of one transfer during the journey.

Living within 4-5km of a train station increases the likelihood of travelling by train, particularly if the person also works in a location that is well served by train.

The catchment of railway stations is largest where stations are served by bus transfers and Park 'n' Ride facilities and lowest for stations without bus transfers and with few Park 'n' Ride bays.

The public transport system is heavily reliant on bus transfers and Park 'n' Ride to enable train users to access train stations.

Train stations on the Mandurah and Butler lines attract more boardings per day, on average than stations on the heritage lines.

Train stations that attract large numbers of users are origin/destination stations located immediately adjacent to metropolitan, secondary or specialised activity (employment) centres. These include Fremantle, Joondalup, Cockburn and Murdoch.

Stations immediately adjacent to residential land uses, lower order activity centres, or low-density employment land uses attract fewer users as do those with few Park 'n' Ride bays, limited bus transfers, and lower service frequency.

## End of Trip Facilities

End of trip facilities are essential to enable active commuting.

## Gender

Mode choice is relatively gender neutral although men are far more likely to be cycle commuters.

Women are significantly more likely to work from home than men.

Women are more likely to be responsible for transporting children to and from school and activities than men.

## Age

Young people in the 15 to 34-year-old age cohort are more likely to be public transport users and are particularly more likely to be bus users but are also more likely to be public transport dependent and to choose car as their ideal mode.

People aged 35 or older are less likely to travel by alternative modes but significantly more likely to choose a non-car commute as their ideal mode.

People aged 40 or over who currently commute by public transport and active modes are far more likely to do so for health and lifestyle reasons.



<b>Income</b>
Public transport dependent users are more likely to be low income earners.
Train is more popular among people who earn in excess of \$100,000 per annum than bus.
High income earners were also more likely to identify non-car modes as their ideal travel mode than low income earners, with a strong preference for cycling and train travel.
<b>Profession</b>
'White collar workers' such as professional service sector workers, clerical and administration workers are more likely to travel to work by public transport than shift workers, trades workers, teachers or health workers.
<b>Lifestyle and Previous Public Transport Use</b>
People who have tried public transport are more likely to commute by public transport.
People who have walked for more than 10 minutes to reach a destination within the last month are more likely to be public transport and active commuters than people who have not walked for 10 minutes or more to reach a destination.
People living in households with one vehicle are 2.9 times less likely to choose to travel by car than commuters who live in a household with two vehicles or more.
<b>Frustrations</b>
Traffic congestion is the major frustration of car commuters; overcrowding is the major frustration of train commuters; and overcrowding and reliability are the major frustrations of bus commuters. Safety and infrastructure quality are the major concerns of cyclists and walkers.
<b>Behavioural Motivators for Mode Shift</b>
For most car commuters, unless the experience and convenience of car decreases or the cost of driving to work increases, they are unlikely to be motivated to shift from driving to alternative modes voluntarily.
People seek to maximise by making decisions they're happy with and trying to avoid bad decisions and bad outcomes. In Perth and Peel, this means choosing the fastest option or choosing an alternative in order to reduce monetary costs.
Status quo bias or habit pushes people to avoid making changes to their travel choices and ignore or not follow-up on new information affecting the relative appeal of public transport versus car commuting (confirmation bias). In Perth and Peel car is the status quo for the majority.
Inertia can be the result of insufficient motivation, and it is easy to over-estimate how driven individuals are to change and underestimate the need to apply as many forces as available onto motivation.
People avoid negative emotion and commuters will consciously and subconsciously aim to avoid negative emotion associated with their commute. Currently the proportion of public transport and car commuters who report negative emotion is relatively even – reducing motivation for car commuters to change mode.
People minimise effort. Physical effort is a barrier to changing commuter behaviour and in Perth and Peel this is a key barrier to mode change.
<b>Car Commuters Capacity for Change</b>
Approximately 25% of car commuters currently express dissatisfaction or neutral satisfaction with their existing commute and a preference to shift mode in an ideal world.
Car drivers who express dissatisfaction with car and a preference for mode shift are most likely to work in central locations outside the inner CBD.
A significant proportion of people are hindered in their capacity for mode shift by either a need to use their car at work or a need to drop off pick up children.
Almost all commuters who express a preference for mode shift indicate that improved services would be required to facilitate change.

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Only a small proportion of car commuters (8%) express a desire for mode shift and have motivators to shift voluntarily if services/access was improved. All other car commuters are likely to require improved services as well as barriers to continued driving to facilitate a shift.

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White collar workers are most likely to identify a preference for mode shift.

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Train and cycle are the most commonly preferred alternative modes among car drivers.

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Approximately 43% of car commuters have been identified as committed drivers and these people are most likely to work in non-central locations.

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#### Public Transport Users Capacity for Retention

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Approximately 49% of public transport users choose public transport because they prefer it either for ideological and personal reasons or because they would rather travel by public transport than tackle traffic congestion or pay for parking.

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69% of public transport commuters expressed satisfaction with their current mode of commute.

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Public transport users who are dissatisfied are most likely to work in non-CBD locations.

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Lack of access to parking and traffic congestion are key motivators for approximately 51% of public transport commuters.

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33% of public transport users choose public transport for ideological or reasons of personal preference.

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Approximately 15% of public transport users are dependent on public transport because they have no other viable option.

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Train users are slightly more satisfied than bus commuters.

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Committed and circumstantial public transport users are more likely to be aged over 35; have an income higher than \$100,000; and work in a central location than dependent users.

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#### Walking and Cycling Capacity for Retention

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Walkers and cyclists are much more likely to be satisfied with their commute than people using other modes.

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A majority of active commuters are aged over 35 and work in central locations.

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Walkers and cyclists are most likely to identify walking or cycling as their ideal mode and the majority are likely to continue walking or cycling if circumstances permit.

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#### Preferred Solutions

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Support for investment in public transport (new and existing services) as well as initiatives to improve infrastructure and encourage public transport use, walking and cycling is very high (83-92%).

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Support for strategies to use technology to improve the efficiency of the existing transport system (75%) is high. There is also significant community support for increasing the proportion of jobs in suburban centres (75%).

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Support for investment in widening/improving roads is significantly lower (64%) than support for investment in public transport.

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Support for strategies to dis-incentivise driving and fund new public transport by, for example, introducing congestion charges for road use at peak periods and charging more for parking is low (26% to 34%).

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A majority of respondents identify investment in inner and middle suburban areas as being a priority for Perth and Peel most notably light rail and rapid bus solutions for inner and middle locations, which were rated as first priority by 53% of respondents. New outer suburban heavy rail lines was rated as first priority by 24% of respondents.

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## Funding the Future

Access to 'traditional' sources of funding for infrastructure is the major constraint hindering the delivery of infrastructure Australia needs.

There is a need for a long term planning for a pipeline of high-quality public infrastructure projects for Western Australia.

All major infrastructure projects should be assessed through transparent and rigorous cost benefit analysis undertaken early in the infrastructure planning process.

Developing a diverse pool of infrastructure funding and financing options for Western Australia is essential to ensure projects can be delivered in the future.

Funding and financing models should be designed for individual infrastructure projects on a case by case basis using mechanisms from the 'funding pool'. This should be undertaken early in the project process.

There is a need to increase number of Western Australian infrastructure projects including quality urban congestion projects for Perth and Peel on the national Infrastructure Priority List.

The State Government should undertake a detailed assessment of all infrastructure funding and financing options available to identify mechanisms appropriate for Western Australia.



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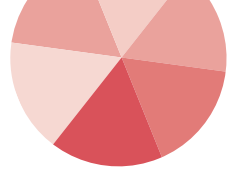
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