

3 FUTURE ACCESS NEEDS AND OPPORTUNITIES

3.1 Introduction

This section outlines key access needs and opportunities relating to the Shepherd Street Precinct in the future.

The primary public transport and active transport access routes connecting the Shepherd Street Precinct to key locations in the surrounding area are described in Sections 3.2 and 3.3 and shown in Figure 3.

The general traffic access routes connecting the Shepherd Street Precinct to key locations in the surrounding area are described in Section 3.4 and shown in Figure 4. In the context of this integrated transport planning process, 'general traffic access' includes private vehicles, service, delivery and emergency vehicles, buses and taxis.

Figure 3 – Primary Access routes serving the Shepherd Street Precinct (key modes)



3.2 Active transport (walking and cycling) access

Before grouping walking and cycling into the overarching 'active transport', care was taken to assess them independently in the case of the Shepherd Street Precinct and its relationship to the Liverpool CBD and Railway Station. Following this assessment, we determined that it was acceptable to present findings under one heading as in this context the issues and opportunities for walking and cycling are very similar.

The Shepherd Street precinct is within 1.1 kilometres of Liverpool Station, the Liverpool CBD and other key destinations in the Liverpool area. This means that there are multiple destinations that could be accessed (for transport or recreation) in a 10-15 minute walk for 5 - 8 minute bike ride from Shepherd Street.

There are three likely routes for people walking or cycling between Shepherd Street and Liverpool Station / CBD, as outlined in Table 3.

Table 3 – Walking and cycling routes between Shepherd Street and Liverpool Station

Route	Walk distance	Considerations
A. Shepherd Street to Liverpool Station via boardwalk (walking and low speed cycling only), Light Horse Park, Newbridge Road (bridge), Bigge Street	1220 metres	Stairs / vertical rise between Light Horse Park and Newbridge Road bridge. Personal security especially at night. Not suitable for cyclists (unless very young)
B. Shepherd Street to Liverpool Station via Riverpark Drive (cycling and walking), Light Horse Park, Newbridge Road (bridge), Bigge Street	1010 metres	Stairs / vertical rise between Light Horse Park and Newbridge Road bridge. Personal security especially at night.
C. Shepherd Street to Liverpool Station via Speed Street, Bigge Street	1080 metres	Delays at signalised crossings Amenity along busy roads

It can be seen that the Route A offers a less direct route than B and C and would only be appropriate for cycling at low speeds. Routes C and B both offer feasible options depending on the time of day, weather and person making the trip.

To ensure that walking or cycling is sufficiently safe and comfortable to encourage people to adopt it in their travel choices, active transport routes need to offer appropriate treatments for the people using them.

3.2.2 'Boardwalk'

For planning purposes, the active transport route between the Shepherd Street Precinct and Liverpool Railway Station / CBD via the existing and proposed 'boardwalk' along the river shore is nominated as a 'recreational' route because it is some 20% longer than the other options and, while providing an amenable experience, would be an unlikely choice for people accessing the CBD for work or other daily activities. i.e. the attractiveness of this route would decrease significantly during inclement weather, at night or if the person perceived a threat to their personal security.

Key characteristics of this active transport route:

- Highest level of amenity.
- High levels of segregation from vehicle traffic
- Quality walking and cycling environment

3.2.3 'Recreational and Commuter' active transport route

For planning purposes, the active transport route between the Shepherd Street Precinct and Liverpool Railway Station / CBD via Shepherd Street, Riverpark Drive, Light Horse Park, Newbridge Street (bridge) and Biggs Street is nominated as a 'recreational and commuter' route. Key reasons are that it is the route most likely to be chosen by people seeking a relatively safe and amenable walking or cycling experience, but it is recognised that the attractiveness of this route would decrease during inclement weather, at night or if the person perceived a threat to their personal security.

Key characteristics of this active transport route:

- Direct
- High level of amenity and segregation from vehicle traffic
- Quality walking and cycling environment
- Shared walking and cycling environments are acceptable if the path width is sufficient to serve the volumes of walkers and cyclists and provide a safe and amenable environment.

3.2.4 'Commuter' walking and cycling routes (busy streets)

For planning purposes, the active transport route between the Shepherd Street Precinct and Liverpool Railway Station / CBD via Shepherd Street, Speed Street and Biggs Street is nominated as the 'commuter' route because it is along moderately- and highly- trafficked streets and is most likely to be chosen by commuters over the course of the day and week (but it is not to say that all commuters would use this route). Key considerations include:

- It provides higher levels of personal security, especially at night and especially for people walking.
- It avoids change of grade associated with stairs up to the Newbridge Road bridge – especially for people cycling

Key characteristics of this active transport route:

- A degree of shelter from sun and rain (for people walking);
- Personal security (the degree to which people feel 'safe') delivered by passive surveillance, lighting and activation;
- Quality walking environment in terms of provision of paths and safe crossings at intersection.
- Direct cycling routes that provide reasonably fast cycling environments, although follow highly trafficked routes;
- Shared walking and cycling environments are acceptable if the path width is sufficient to serve the volumes of walkers and cyclists and provide a safe and amenable environment.

3.3 Public Transport access

3.3.1 Rail

Existing Rail Services

The LCC is well connected to the Sydney Trains network, with direct services via the following rail lines:

- The Inner West (T2) line providing services between Liverpool and the Sydney CBD via Granville
- The Bankstown (T3) line providing services between Liverpool and the Sydney CBD via Bankstown
- The Cumberland (T3) line providing services between Liverpool and the Sydney CBD via Blacktown

With transfers, the LCC is connected to numerous other key destinations served by the Sydney Trains network.

Future rail capacity to serve the Shepherd Street Precinct

This integrated planning assessment assumes that the rail system will provide the necessary capacity to serve the future needs of the Shepherd Street Precinct. TfNSW is responsible for planning rail upgrades (infrastructure and services). It does this planning based on land use policy and projections of which the Shepherd Street redevelopment forms part. It would be unusual for relatively small individual developments to take part in the rail service and network planning process.

Rail Access options for the Street Precinct

The Shepherd Street Precinct is located approximately 1.1 kilometres from Liverpool Station. This is within a commonly-accepted walking distance to rail hubs.

The key mode of access between the railway station and the Shepherd Street Precinct is likely to be walking (covered in Section 3.2), although there would be benefits to customers by providing bus services for use by people with limited mobility, during inclement weather or times where they have concerns for their personal security. Access by bus is covered in Section 3.3.

3.3.2 Bus

Existing Bus Services

The LCC is currently serviced by three bus regions and the Liverpool-Parramatta Tway.

- Region 2 buses (operated by Interlink) provide services between the LCC and the west and south-west via:
 - Moore Street and the Hume Highway
 - Moore Street, Flowerdale Road and Hoxton Park Road.
- Region 3 buses (operated by Transit Systems) provide services between the LCC and the west and north-west via Moore Street, Liverpool Street and Memorial Ave.
- Region 13 buses (operated by Transdev) provide limited services between the LCC and the east via Morebank Avenue and Newbridge Road.
- The Liverpool-Parramatta T-Way runs along Moore Street to Liverpool Station / Bus Interchange.

There is currently no regular bus route that runs within a convenient walking distance of the Shepherd Street Precinct.

Future demand for a bus service between the Shepherd Street Precinct and Liverpool Station / CBD

Even sophisticated multi-modal demand models struggle to provide estimates of demand for feeder bus services to stations that are consistent with the real world. Preliminary-level estimates are explored below to provide order of magnitudes of likely future demand on a bus service between the Shepherd Street Precinct and Liverpool Station / CBD. These are based on a very conservative (high) estimate of the likely proportion of residents that would travel by bus to the CBD / station. Although this level of bus use is unlikely, it is tested as a 'top-end' estimate of bus demand.

Scenario 1: Existing (2011) Journey to Work Mode Shares, conservative (high) estimate that 50% of residents would use buses to access the station / CBD

Drawing on data in Figure 2, and using a very high estimate of the proportion of Shepherd Street Precinct residents that would use buses to access the Station / CBD (50%), would give rise to the following scenario:

- Developer's estimate of the number of dwelling units in the Shepherd Street Precinct: 1500
- Council's estimate of traffic generation in the AM peak hour (vehicles / hr) 348
- Mode share for journey to work trips by car in Shepherd Street: 56%
- Mode share for journey to work trips by public transport (train and bus) in Shepherd Street: 23%
- Rough estimate of Shepherd Street PT trips made in the AM peak hour: $23\% / 56\% \times 348 = 143$
- If 50% of Shepherd Street residents accessed the station by bus in AM peak hour, trips/hr: 72

Scenario 1 would require one to two bus services per hour to serve demand.

Two bus services per hour (one bus every 30 minutes) would provide a basic level of service but would unlikely be sufficient to capture 50% of the customer market accessing the station / CBD.

Scenario 2: 2041 Journey to Work Mode Share estimate, conservative (high) estimate of 50% of residents using buses to access the station / CBD

Drawing on data in Figure 2, and using a very high estimate of the proportion of Shepherd Street Precinct residents that would use buses to access the Station / CBD (50%), would give the following:

- Developer's estimate of the number of dwelling units in the Shepherd Street Precinct: 1500
- Council's estimate of traffic generation in the AM peak hour (vehicles / hr) 348
- Mode share for journey to work trips by car in Shepherd Street: 42%
- Mode share for journey to work trips by public transport (train and bus) in Shepherd Street: 41%
- Rough estimate of Shepherd Street PT trips made in the AM peak hour: $41\% / 41\% \times 348 = 348$
- If 50% of Shepherd Street residents accessed the station by bus in AM peak hour, trips/hr: 174

Scenario 2 would require three bus services per hour to serve demand.

Three bus services per hour (one bus every 20 minutes) would provide a reasonable level of service but would unlikely be sufficient to capture 50% of the customer market accessing the station / CBD.

Bus Access options for the Shepherd Street Precinct

Shepherd Street is within 1.1km (or a 10 – 15 minute walk) of Liverpool Station.

As noted in Section 3.2, for most of the people travelling between Shepherd Street and Liverpool Station / CBD, walking would be the most feasible access option.

For a bus service to be attractive to a large proportion of potential customers in the Shepherd Street precinct, it would need to operate:

- Within an easy walking distance of the precinct
- At frequencies that are sufficiently attractive to users (10-15 minute headways in the peak and 20-30 minute headways in the off-peak)
- From early in the morning until late in the evening (i.e. a long service span)

While a developer-provided shuttle bus operating between the Shepherd Street Precinct and Liverpool Railway Station constitutes a potential option, it is unlikely to be an optimal or even feasible long-term solution. Key reasons include:

- A bus service is most effective when it serves a range of land uses and destinations. A 'point-to-point' bus servicing one development will generally not run at sufficient frequencies and service spans to attract patrons and serve a productive transport function;
- Buses that are running with low passenger loads are not cost effective and if numerous developments started adopting the approach of providing their own bus services, it would contribute to congestion in the bus interchange and streets within the Liverpool city centre;
- Privately operated bus services are generally not allowed to charge fares within a State Government regulated bus region.

A more likely (and effective) way of servicing areas that are close to or within a City Centre - such as the Shepherd Street Precinct - is by running buses from areas further afield through the areas.

In the case of the Shepherd Street Precinct, this would generally be achieved by diverting some of the Region 2 buses running between Liverpool Station and areas to the south west via the Hume Highway. However, a key challenge for servicing the Shepherd Street Precinct by bus is that there are very limited bus routing opportunities between the Hume Highway and Liverpool Station via the precinct due to a lack of local road connections to the Hume Highway or across the railway.

Effective ways that bus services could be provided for the area in which the Shepherd Street Precinct is located include:

- In the short term: Extend one of the existing bus routes such that it terminates at the southern end of Shepherd Street (or continues to Casula Station) rather than at the Liverpool Bus Interchange. Consideration would need to be made of driver requirements and turning opportunities, but this would be a more cost effective way of linking the Shepherd Street precinct to Liverpool Railway Station (and potentially Westfield and Liverpool Hospital) by augmenting the existing bus network.
- In the medium term: establish a bus service within the Liverpool city centre that provides access to and integrates the developing areas on the eastern side of the Georges River, with those on the west.

The Developer is open to discussing a range of bus servicing options (short and long term) for Shepherd Street with both LCC and TfNSW.

3.4 General Traffic access

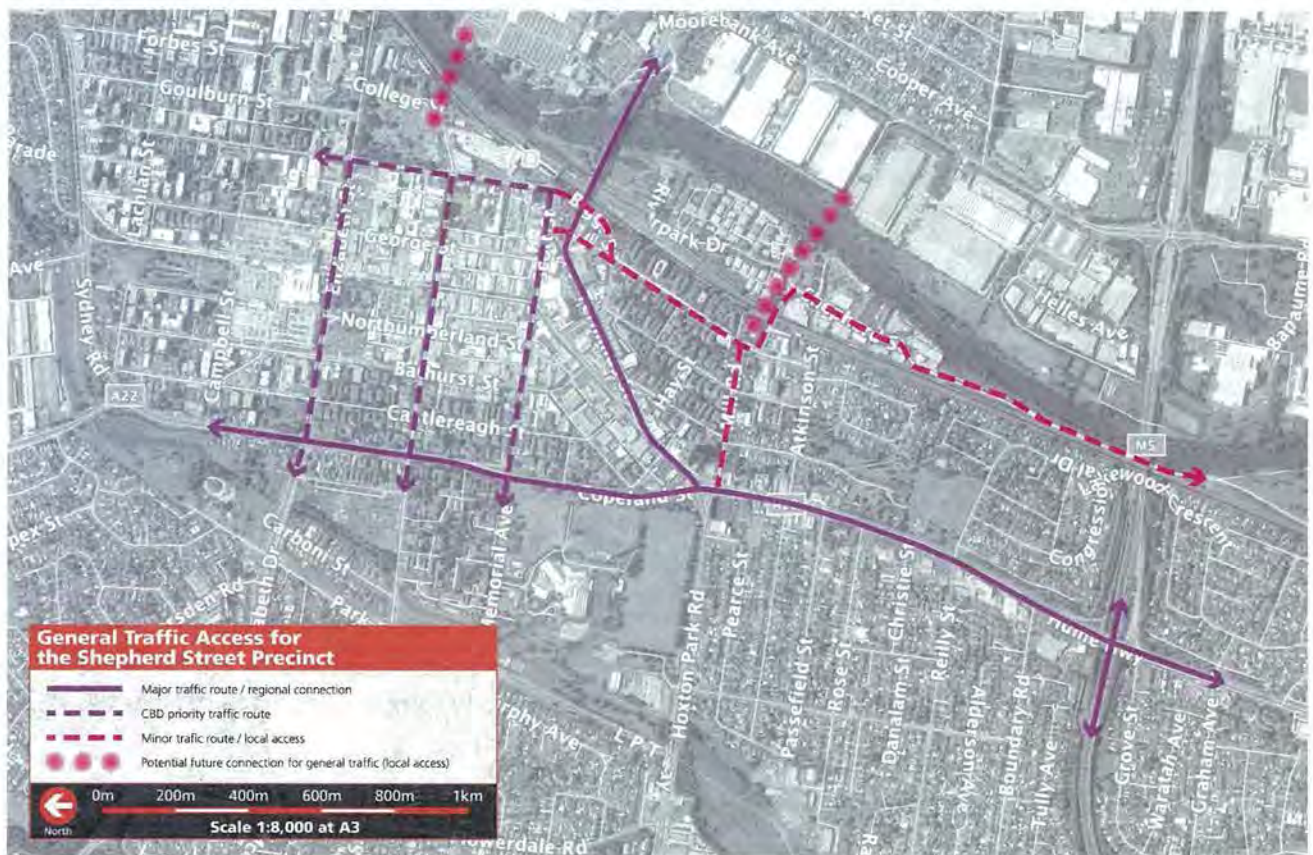
In the context of this integrated transport planning process, 'general traffic access' is defined to include private vehicles, service, delivery and emergency vehicles, buses, taxis (including ride share services such as Uber).

All the modes making up 'general traffic' will rely on the road network to provide access to the Shepherd Street Precinct. Importantly, this process recognises that people walking and cycling share the road network with general traffic.

A key focus of the integrated transport planning process is to ensure that the road network can deliver balanced outcomes to enable access to the Shepherd Street by the full suite of transport modes and services.

The general traffic access routes serving the Shepherd Street Precinct are shown Figure 4.

Figure 4 – General traffic access routes serving the Shepherd Street Precinct



Existing general traffic access for the Shepherd Street Precinct

Key access functions of the general traffic routes currently serving the Shepherd Street Precinct are outlined below.

General traffic route	Access function
Powerhouse Road	Local connection to south for general traffic
Mill Road / Shepherd Street	Local connection to west for general traffic Access to regional road network (including Hume Highway and M5)
Speed Street / Shepherd Street	Local connection to the Liverpool CBD, Railway Station and Bus Interchange Access (northbound) to regional road network (Newbridge Road)

General traffic access for the Shepherd Street Precinct proposed in the master plan

The Shepherd Street development will be modest in size and the *Traffic Report* (InRoads Group, 10 March 2016) indicates that the surrounding street network will be able to accommodate the traffic generated by the land uses being considered with minimal impacts. Additional traffic modelling will be undertaken in conjunction with Council to assess traffic impacts associated with the development on the broader area

Key features of the masterplan that relate to general traffic access include:

- Construction of a cul-de-sac at the eastern end of Atkinson Street
- Provision of two east-west laneways from Shepherd Street towards the river (between 20 and 26 Shepherd Street and between 28 and 32-34 Shepherd Street). These would serve the dual function of providing connectivity for people and vehicles and providing access to off-street parking
- Provision of pedestrian-only east-west laneway from Shepherd Street towards the river (between 32-34 Shepherd Street and 28 and 31-33 Shepherd Street).
- Streetscaping and formalisation of kerbside parking
- Realignment of Powerhouse Road through the site so as to form an extension of Shepherd Street

Future general traffic access connections

The Georges River and Railway line constitute a major barrier to access for the future Liverpool City Centre – especially locations to the east of the Railway line.

To provide the levels of access and connectivity necessary to develop a competitive and efficient city centre, a number of additional local links may be required to serve people walking, driving, cycling and using public transport in the Liverpool City Centre.

Preliminary assessment indicates two potential locations for future connections across the Railway line and Georges River:

- Opportunity #1: Crossing in the vicinity of Moore Street. A connection heading east across the railway line and river at the location where Moore Street meets George Street. This would be important to promote the redevelopment of the Pirelli site.

- Opportunity #2: Mill Road. A connection heading east across the railway line into the Shepherd Street Precinct and across the river to (eventually) connect to Moorebank Avenue

In addition to these potential future links to better connect the city centre, there is a more immediate opportunity that could provide an alternative local traffic connection. There is an existing (albeit currently closed) road connection under the railway line at Woodbrook Road. It has a relatively low clearance (signposted as 3.6 metres) and interfaces with minor, residential streets.

Re-establishing this connection could provide an alternative route between Powerhouse Road and the area to the east of the Hume Highway. This could reduce the need for vehicles making short, local trips using the Hume Highway. It is noted that traffic modelling to date has not indicated the need for this connection.

4 TRANSPORT INITIATIVES TO SUPPORT DEVELOPMENT OUTCOMES

4.1 Introduction

This section outlines a set of potential initiatives to support future development in Shepherd Street.

Initiatives have been provided for key modes of access and have been structured in two parts:

- Initiatives that are necessary to achieve the desired transport / land use outcomes of the *overall evolving Liverpool City Centre*. These initiatives are generally in control of the local or state government (although they might have interfaces with individual developments). These initiatives are identified by 'CC' before the reference number.
- Initiatives that are necessary to achieve the desired transport / land use outcomes of the Shepherd Street Precinct development. These initiatives have been developed such that they are largely within the control of Developer. These initiatives are identified by 'SS' before the reference number.

The initiatives outlined in this section draw on the information and assessment outlined in previous sections

Transport initiatives for Shepherd Street that integrate with the transport plans for the overall Liverpool City Centre

The Shepherd Street Precinct constitutes one part of the overall redevelopment of a significant part of the Liverpool City Centre.

A range of initiatives is required to enable, support and optimise the outcomes as the Liverpool City Centre developers. Some of these are within the scope of individual developments, but many are the result of cumulative impacts or the need to support the 'common good', and thus are the responsibility of the local or state government.

4.2 Outcome #1 - Interconnected street network to support the development of the Liverpool City Centre

4.2.1 Potential initiatives needed to support the development of the Liverpool City Centre Overall

Initiative CC1.1: Confirm locations of future connections across the railway line and Georges River

As part of its plans for a major intensification of the Liverpool City Centre, Council has likely undertaken the necessary assessments and strategic planning to determine the future street connections required to support the range of access requirements for the future LCC. The developer should approach Council to establish whether it has committed plans to establish additional links over the Railway and Georges River as part of the evolution of the overall Liverpool City Centre.

As outlined earlier in Section 3.4, preliminary assessment indicates two locations for potential future connections across the Railway line and Georges River: one in the vicinity of Moore Street and a second in the vicinity of Mill Road.

4.2.2 Potential initiatives needed to support the development of the Shepherd Street Precinct Itself

Initiative SS1.1: Development envelope that would enable a grade separated local connection across the Railway and Georges River

It is understood that Council has no planned future connections across the Railway and Georges River.

The developer should confirm with Council that it has no committed plans to establish additional links over the Railway and Georges River in locations that have an interface with the Shepherd Street precinct. It is noted that the alignment and configuration of any connection over the railway and Georges River could also influence the road alignments and intersection layouts within the Precinct.

If Council is considering such plans, the developer should request that Council provides the necessary assurance that it will not affect the planning, feasibility and timing of the Shepherd Street Precinct.

4.3 Outcome #2 - Improved active transport (walking and cycling) connections between Shepherd Street Precinct and Liverpool Station / CBD

4.3.1 Potential initiatives needed to support the development of the Liverpool City Centre overall

Initiative CC2.1: Confirm the function, alignment and configuration of the active transport route(s) between Mill Park and Light Horse Park

The concept masterplan for the Shepherd Street Precinct identifies a pathway along the river shore (the "boardwalk"). This would connect with the shared path through Mill Park in the south and the existing foreshore path north of Atkinson Street.

Before the developer can finalise the configuration and design of the boardwalk, it will be necessary to better understand:

- The function of the paths connecting at its northern and southern end;
- How it interrelates with other parallel route options that could serve the same role.

The developer should therefore consult with Council to confirm the function, alignment and configuration of the active transport route(s) between Mill Park and Light Horse Park. The following insight is provided to inform discussions:

- Route along Shepherd Street and Riverpark Drive
 - Shepherd Street and Riverpark Drive provide the most direct route and would likely be used by the bulk of people who are accessing the station or CBD via Light Horse Park. For this reason, this should be the nominated active transport route for commuter use.
 - A shared walking and cycling path along the western side of Shepherd Street currently the function of the active transport link. While this is appropriate for the existing land use and

levels of activity, it might cause conflicts between people walking and cycling in the future as activity in the area increases. Council should determine whether this configuration should remain or if a different configuration would be more appropriate for people walking and cycling along Shepherd Street (e.g: a segregated bi-directional cycleway, on street cycle lanes combined with reduced speed limits, on street cycling with traffic calming to ensure drivers travel at low speed etc).

- Council should determine the most appropriate treatment of Riverpark Drive for it to serve as a safe and amenable walking and cycling connection between Shepherd Street and Light Horse Park.
- Route along the boardwalk
 - The boardwalk would unlikely be used by commuters accessing the Liverpool CBD or station as it is less direct than the Shepherd Street / Riverpark Drive route and is too narrow to enable cycling at higher speeds. According to the NSW Bicycle Guidelines, shared paths should be at least 2.5 metres wide and preferably 3.0 metres to provide amenable and safe conditions for all users.
 - The boardwalk will mainly serve as a recreational path for walking, people using mobility devices and for people cycling at low speed for recreational purposes.

In summary, the current alignment and dimension of the boardwalk would mean that it would be generally be used for recreational activities rather than commuting trips. It would entail a longer route between Shepherd Street and the station / CBD and would be too narrow for commuter cyclists travelling at high speeds to safely share with walkers.

Initiative CC2.2: Integrated design of the boardwalk between Mill Park and Light Horse Park.

The Developer should work with Council to ensure that boardwalk proposed as part of the Shepherd Street Precinct masterplan (between Mill Park and Atkinson Street) is compatible with Council's future plans for an upgrade to the existing boardwalk (between Atkinson Street and Light Horse Park)

This integrated design should reflect the agreed function, configuration and design treatments of the boardwalk (as discussed in Initiative CC2.1).

Initiative CC2.3: Investigate the benefit of a ramp / DDA-compliant connection between Light Horse Park and Newbridge Road (bridge)

The connection between Light Horse Park and the shared path along Newbridge Road (bridge) is currently provided by stairs. This limits the attractiveness of this connection for cyclists and is not DDA compliant.

Should Council desire to attract cyclists to the "recreational" route through Light Horse Park (rather than the "commuter" route along Speed Street and Bigge Street), investment in a cycling ramp in this location would influence the travel choices of people living and working in Shepherd Street precinct.

The Developer should consult with Council to understand its views on the need for an improved connection in this location as part of the overall development of the LCC, and establish the level of commitment and timing of any future improvement.

4.3.2 Potential initiatives needed to support the development of the Shepherd Street Precinct itself

Initiative SS2.1: Establish a safe and amenable walking and cycling environment along Shepherd Street

Based on the function, alignment and configuration of the active transport route(s) between Mill Park and Light Horse Park agreed with Council (as outlined in Initiative CC 2.1), the Developer should establish a safe and amenable walking and cycling environment along Shepherd Street. Potential features could include:

- Speed limits and/or traffic calming treatments;
- Modifying the existing shared pedestrian / bike path arrangements to footpaths and on-road cycling facilities;
- Streetscaping / street trees;
- Awnings along building frontages to provide shelter for people walking.

Initiative SS2.2: Implement the boardwalk along the Shepherd Street Precinct between Mill Park and Atkinson Street

Based on the function, alignment and configuration of the active transport route(s) between Mill Park and Light Horse Park agreed with Council, the Developer should Implement the boardwalk along the Shepherd Street Precinct between Mill Park and Atkinson Street. It is recognised, however, that this would be a supporting facility for recreational active transport rather than the primary active transport path for commuters.

Initiative SS2.3: Provide secure bicycle parking within the development

The developer should provide secure bicycle parking to serve residents and tenants within and visitors to the Shepherd Street Precinct.

- For residents and tenants, this would best take the form of secure, communal bicycle parking facilities (a bike room or bike cage etc). This could be provided in the underground parking area.
- For visitors, this would take the form of bike racks at street level to provide a place to lock bicycles.

4.4 Outcome #3 - Enable integration of Shepherd Street precinct into the bus network serving the surrounding region

4.4.1 Potential initiatives needed to support the development of the Liverpool City Centre overall

Initiative CC3.1: Collaborate with Council and TfNSW to promote a future bus route to serve Shepherd Street

As outlined in Section 3.3.2, the most likely and effective way of establishing a bus service to serve the Shepherd Street precinct is by extending an existing route to run along Shepherd Street.

Work with Council and TfNSW to investigate the potential for a bus service to link Shepherd Street to the Liverpool Station / CBD.

- Short term: Extend one of the existing bus routes such that it terminates at the southern end of Shepherd Street rather than at the Liverpool Bus Interchange. Consideration would need to be

made of driver requirements and turning opportunities, but this would be a cost effective way of linking the Shepherd Street precinct to Liverpool Railway Station (and potentially Westfield and Liverpool Hospital) by augmenting the existing bus network.

- Medium term: establish a bus service within the Liverpool city centre that provides access to and integrates the developing areas on the eastern side of the Georges River, with those on the west.

4.4.2 Potential initiatives needed to support the development of the Shepherd Street Precinct itself

Initiative SS3.1: Enable and set aside funding for a bus stop for the Shepherd Street Precinct

- The design of built form, pathways and access points for the Shepherd Street Precinct should incorporate a bus stop that can be implemented once a bus service runs past the development. See 0 for indicative locations.
- If bus shelters are not integrated into the design of buildings / awnings, then the Developer should set aside funds to contribute to the eventual delivery of bus shelters.

4.5 Outcome #4 – Efficient access for service and delivery vehicles and taxis within the development

4.5.1 Potential initiatives needed to support the development of the Liverpool City Centre overall

Initiative CC4.1: Requirements for servicing and delivery that reflect the desired public domain outcomes in the Liverpool City Centre.

To achieve high quality public domain outcomes and efficient servicing and deliveries for developments within the city centre, Council will benefit from adopting a set of consistent requirements for providing for service and delivery vehicles.

Ideally, these planning controls will ensure that loading and servicing activities take place within the development itself and with minimal impacts on the city centre (impacts on traffic circulation, visual and noise impacts associated with deliveries and servicing, e.g. garbage removal, maintenance etc).

4.5.2 Potential initiatives needed to support the development of the Shepherd Street Precinct itself

Initiative SS4.1: Provide access and space for loading and servicing within the development

As the density of development increases, so will the intensity of activity associated with servicing and deliveries associated with the Shepherd Street Precinct.

The Developer should provide space for service and delivery vehicles within the development to avoid these activities needing to take place on-street. This will take the form of:

- Loading docks for deliveries and removal of garbage;
- Parking spaces for vehicles associated with servicing and maintenance; and
- Access driveways and ramps that are appropriately dimensioned for service and delivery vehicles.

To improve the transport and public domain outcomes within the Shepherd Street Precinct, the Developer should design accesses for off-street loading and servicing areas sensitively so they avoid impacts on the streetscape and precinct overall.

Initiative SS4.2: Providing on-street space for taxis and short-stay activities in the Shepherd Street Precinct

There are numerous activities within city centres that require space on-street. These include: taxi pick-up and drop-off (including services such as Uber), mail zones, quick pick-up or deliveries for commercial land uses (such as cafés, dry cleaners), emergency vehicles.

Short stay spaces (for example 5 minute parking), offers an effective mechanism for serving a range of these activities without needing to dedicate on-street spaces for each of them.

The Developer should include the potential for these short-stay, multi-uses spaces on-street in their planning and design process.

4.6 Outcome #5 - Efficient models of traffic generation and parking provision

Guidelines to determine traffic generation and parking supply

Councils in NSW have typically relied on the *Guide to Traffic Generating Developments* (RTA, 2002) and associated sources such as *Technical Direction TDT 2013/ 04a* (RMS, August 2013) to project and assess traffic impacts associated with proposed developments and to determine parking requirements.

The *Guide to Traffic Generating Developments* (RTA, 2002) is very outdated (it is over 14 years old). Even when it was released, the sample sizes for different land uses were relatively small and did not adequately reflect the local context in which development was located (for example access to high quality public transport). The *Technical Direction TDT 2013/ 04a* (RMS, August 2013) goes some way to addressing the issue of developments close to centres and/or near high quality public transport and uses more recent measurements but still is limited by the relatively small sample size and specifics of the location.

Given the significant influence of these guidelines on traffic network upgrades and parking supply – and the significant cost to developers in responding to these requirements - they constitute an issue of some relevance to Developers.

4.6.1 Potential initiatives needed to support the development of the Liverpool City Centre overall

Initiative CC5.1: Traffic generation estimates derived from similar developments

The Liverpool city centre is projected to develop significantly over the next 25 years. The traffic generation associated with developments within the city centre will therefore be a key issue in terms of road network planning, and will influence the contribution that the developers will need to make towards any upgrades of the road network.

For these reasons, it is very important that the traffic generation rates reflect (as closely as possible) the likely traffic reality associated with the future Liverpool City Centre.

Council would benefit from undertaking a process by which generic traffic generation rates are reviewed and assessed against measured traffic generation rates in similar locations and which reflect the land use and activities proposed in different parts of the LCC as closely as possible. This process could be undertaken by Council itself or could be required by individual developers as part of the approvals process.

Any proposed modifications to the traffic generation rates would best be made in a process of consultation with RMS, TfNSW, DPE and representatives of the development community to ensure that they not only reflect the location and context of the LCC, but also reflect future aspirations and the market's position on such inputs as parking provision (which has a strong influence on traffic generation).

This process may conclude by adopting rates similar to the current RMS rates, or could adopt more aggressive (i.e. lower) traffic generation rates that might better reflect the realities of the future LCC.

Initiative CC5.2: Parking rates that reflect the future needs of LCC rather than past or current approaches

It is in Council's interest to ensure that the provision of parking reflects very closely the future market demand for parking as requiring Developers to provide excessive amounts of parking can have some undesirable side effects. Reasons that parking rates need to be considered very carefully include:

- There is a very strong interrelation between parking supply and traffic generation. As city centres grow, an oversupply of parking can lead to increased traffic generation and congestion;
- Providing on-site parking (especially when underground) entails significant cost, not only in terms of the cost to purchases / leasers, but also in terms of construction impacts and materials. These costs are passed on to the selling price of the development and to the community more broadly;
- If excessive parking is provided, and the costs are passed on to owners or tenants, there is the incentive for owners or tenants who do not require parking to recoup the costs of their parking by leasing excess spaces to other parties. The share economy is already tapping into this situation through websites such as Divvy and Parkhound. This will have implications on the traffic generated by a development.

There is a strong justification, therefore, for Council to 'pressure test' the parking rates included in its DCP and/or RMS guidelines in order to ensure that they reflect the future aspirations for the Liverpool City Centre.

Initiative CC5.3: The potential for 'unbundling' of parking provision in developments within the LCC

Councils in NSW have traditionally expressed residential parking requirements as a rate of parking spaces per dwelling unit. This approach effectively makes an assumption of the parking needs of residents and 'bundles' the cost of parking provision with the cost of the dwelling. Two key consequences of this are:

- The cost of parking pushes up the cost of real estate (and then is transferred into other goods and services) – even though the resident might not want to pay the price associated with parking.
- By 'hiding' the cost of parking makes individuals less likely to seek alternatives to driving

In order to support its desired transport outcomes in the LCC, Council should investigate the potential to allow (or trial) 'unbundling' of some of the parking provision within developments in the LCC.

'Unbundling' of parking can take two main forms:

- **Unbundling of parking ownership:** Rather than requiring developers to allocate all residential parking to specific dwellings, this would allow a proportion of the overall parking supply to be 'unbundled'. This would allow a range of positive outcomes, including:
 - Residents who did not want to pay the cost of an underground parking space they did not need could purchase their dwelling at a lower cost;

- Residents who wanted additional parking could purchase additional parking as part of their landholding (as long as there was sufficient available);
- The body corporate could 'own' some of the unbundled parking within a development and lease it to residents (or commercial tenants) who had a need for it (but did not want to own it) – for example: a young adult living with their parents for a few years)

Overall, it would be allow parking provision that better responded to the evolving needs of the development rather than providing at a 'one size fits all' rate at the time of construction. This has the potential to reduce the risk of oversupplying parking and the traffic generation associated with such an oversupply.

- **Spatial unbundling of parking:** Rather than requiring developers to allocate the parking supply to the specific building in which each land use is located, 'spatial unbundling' allows more flexible spatial configurations of the parking supply (and access to the parking supply). This increases the potential for optimising the allocation of parking over the life of the development as well as creating the opportunity for shared use of some of the parking supply (for example workers could use some of the parking freed up by residents once they leave for work). There are precedents where some parking was provided either at grade or above ground so that it could be converted to alternative uses at a later stage if demand reduced (or did not eventuate).

With a degree of unbundling (ownership and spatial), the opportunity for creative approaches to parking will multiply and enable the use of pricing, cost and benefit allocation mechanisms, access management, share economy (including car share and leasing of parking spaces) to achieve more efficient access outcomes.

4.6.2 Potential initiatives needed to support the development of the Shepherd Street Precinct itself

Initiative SS5.1: Investigate and 'test' traffic generation and parking rates to be applied to the Shepherd Street Precinct

Given the high cost of providing on-site parking and the evolving attitudes to paying for parking within the community, it is recommended that the Developer undertake some research to inform discussions with Council in relation to traffic generation rates and parking provision rates to be applied to the Shepherd Street Precinct.

It is suggested that the Developer commission traffic generation surveys for developments similar to the Shepherd Street Precinct. These developments should have a similar mix of residential and commercial uses, have a similar typology and parking supply and be around 1km from the railway station and CBD in an outer western Sydney city centre. This could be combined with 'market sounding' to understand the relationship between parking provision and community attitudes.

Initiative SS5.2: Investigate the potential for unbundled parking (ownership and spatial) within Shepherd Street

The developer should consider 'unbundling' some of the parking supply (as outlined in Initiative CC 5.3) - even if the overall rate of parking provided in the development still reflects Council's current requirement. There are a number of models by which to manage unbundled parking, including:

- Making it available for purchase by other residents
- The body corporate owns it and leases it to residents

'Unbundling' parking could bring a range of benefits:

- For residents who do not wish to take-up the offer of parking, there would be a reduction in their purchase price.
- For residents who require more parking than the rates provide, there is the option to purchase or lease the parking.

It is recognised that 'unbundling' of parking entails a range of risks, for example relating to the demand for unallocated spaces and the transfer of ownership. These would need to be assessed and mitigated as part of more detailed investigations.

Initiative SS5.3: Pursue time limits for on-street parking to improve turnover

In city centres, on-street parking constitutes only a small portion of the overall parking supply and will rarely be able to meet demand.

For this reason it should be managed (through time limits and/or pricing) to ensure a high rate of turnover. This will mean that the limited on-street parking is better allocated to vehicles that extract value from it.

The developer should work with Council to support parking management outcomes that avoid long stay parking on public roads or laneways.

Initiative SS5.4: Enabling use of the share economy to provide better parking outcomes

Information technology is supporting the share economy to provide a range of access options to support the evolving Liverpool City Centre. It is recommended that the Developer pursue opportunities associated with the share economy for Shepherd Street Precinct. These include:

- Car share – Car share providers such as Go Get do not currently have a strong presence in outer western Sydney but generally favour city centre locations such as Liverpool. It is recommended that the Developer allocate space within the development as well as potentially on-street to accommodate car share.
- Peer to peer car share – Unlike car share which requires a car space to be made available (either by the road authority or land owner) for the car share operator to deploy one of its vehicles, peer-to-peer car share allows individuals to use each others cars through an internet platform and security technology installed in vehicles. For peer to peer car share to work within a development such as the Shepherd Street Precinct will rely on the Developer and building operators to allow alternative access and security arrangements.
- Bike share – Bike share – even in Metropolitan centres such as Melbourne and Brisbane - has been slow to take off in Australia. Reasons cited include helmet laws, limited provision of safe cycle facilities and hostility of motorists to cyclists. Bike share – more so than car share – relies on the provision of a network of bikeshare pods. For this reason, while it is unlikely to be feasible in the short term, the Developer should provide space for the future implementation of bikeshare pods.

4.7 Outcome #6 – Provide travel information

4.7.1 Potential initiatives needed to support the development of the Shepherd Street Precinct itself

Initiative SS6.1 - Travel information to inform incoming residents and commercial tenants

Research shows that at the time when residents and commercial tenants move into a new dwelling or commercial tenancy, people are more likely to consider changing their travel habits. To promote the adoption of travel by modes other than private vehicles, the Developer should provide travel information to new residents and commercial tenants in Shepherd Street. This could take the form of a 'smart travel plan' and would include information relating to public transport services, car share options, personal security and safety etc.

APPENDIX A

TRAVEL DATA

Figure 5 – Journey to Work Data, Liverpool. Residents commuting out.

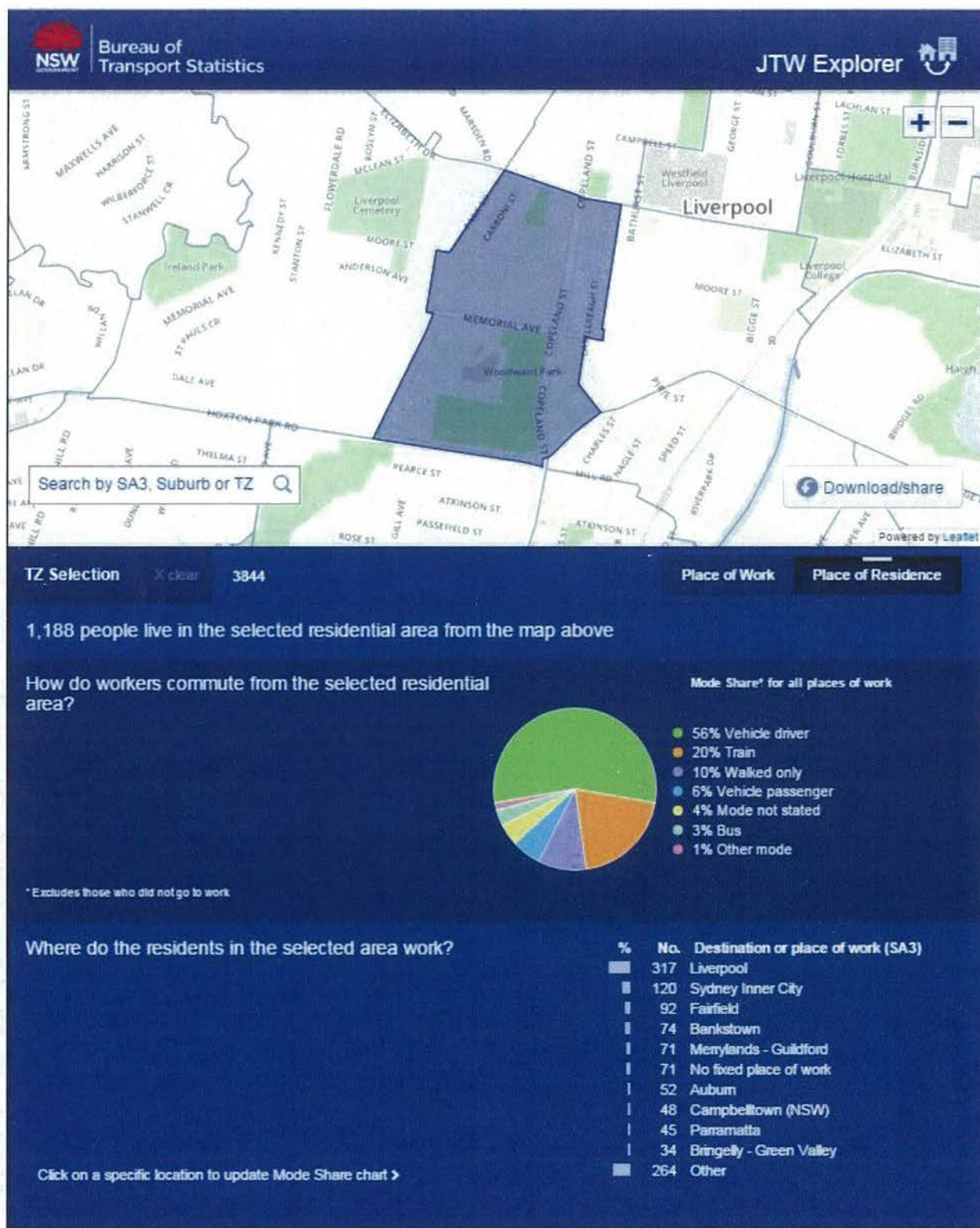


Figure 6 – Journey to Work Data, Liverpool. Workers commuting in.

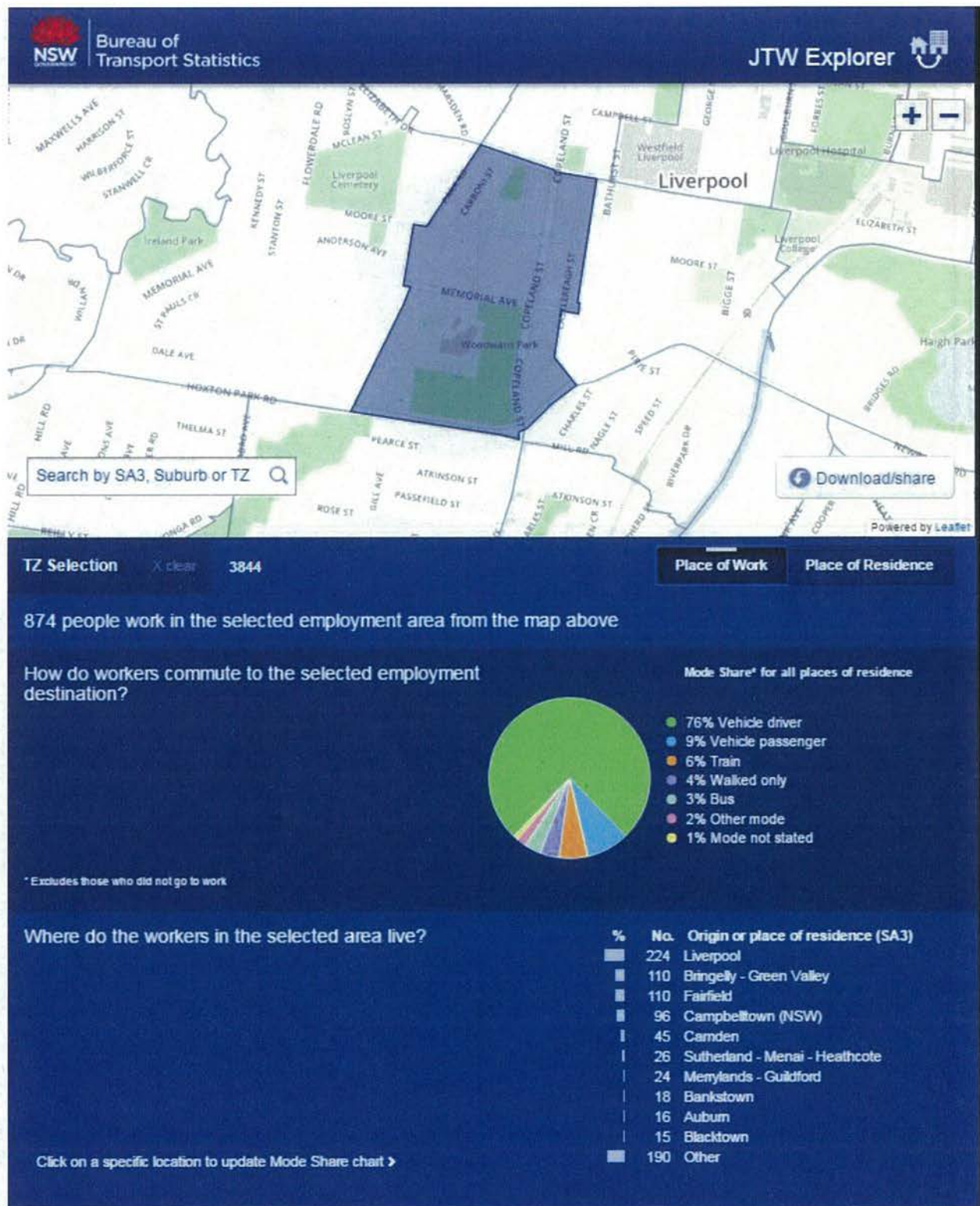


Figure 7 – Journey to Work Data, Blacktown. Residents commuting out.

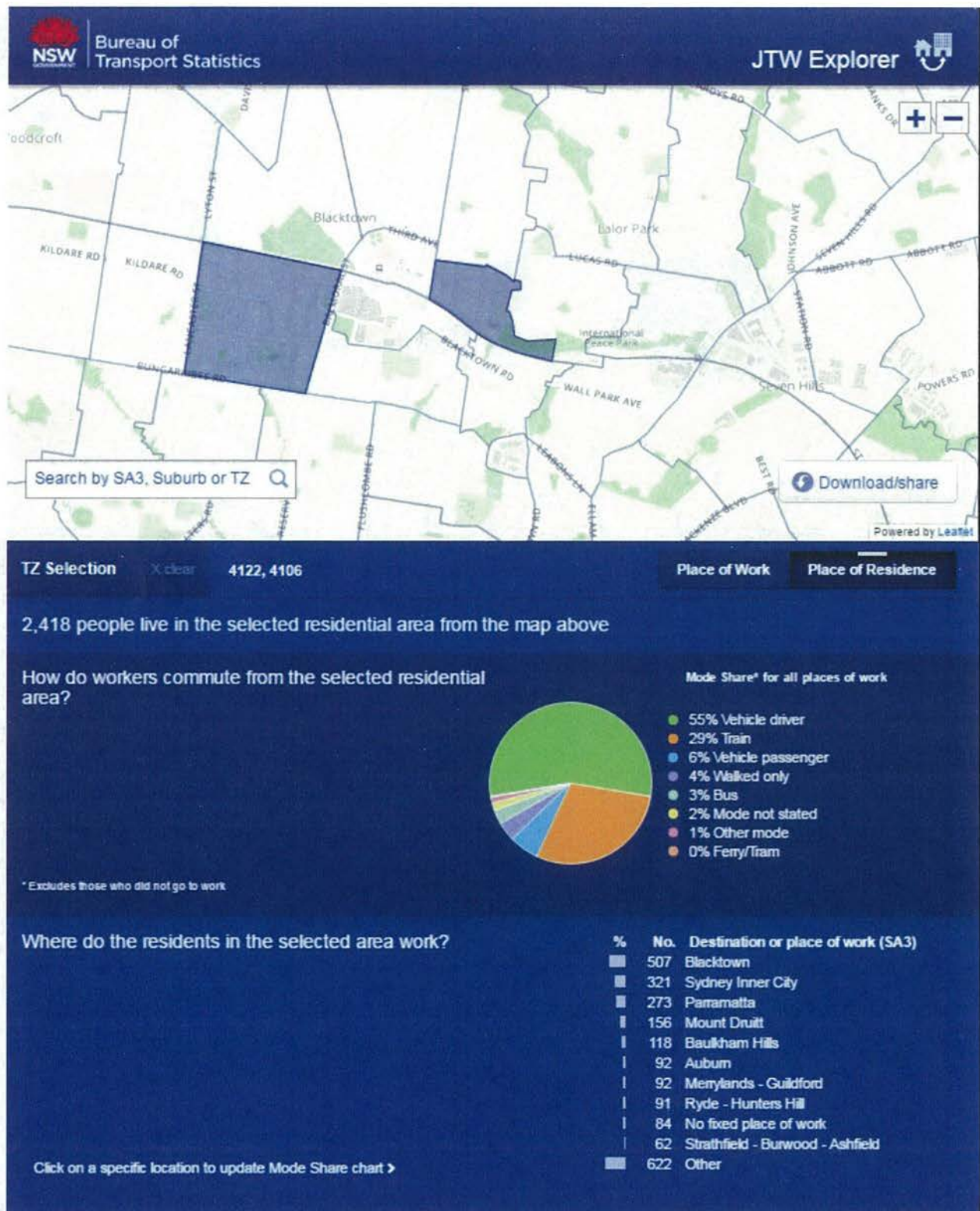


Figure 8 – Journey to Work Data, Blacktown. Workers commuting in.

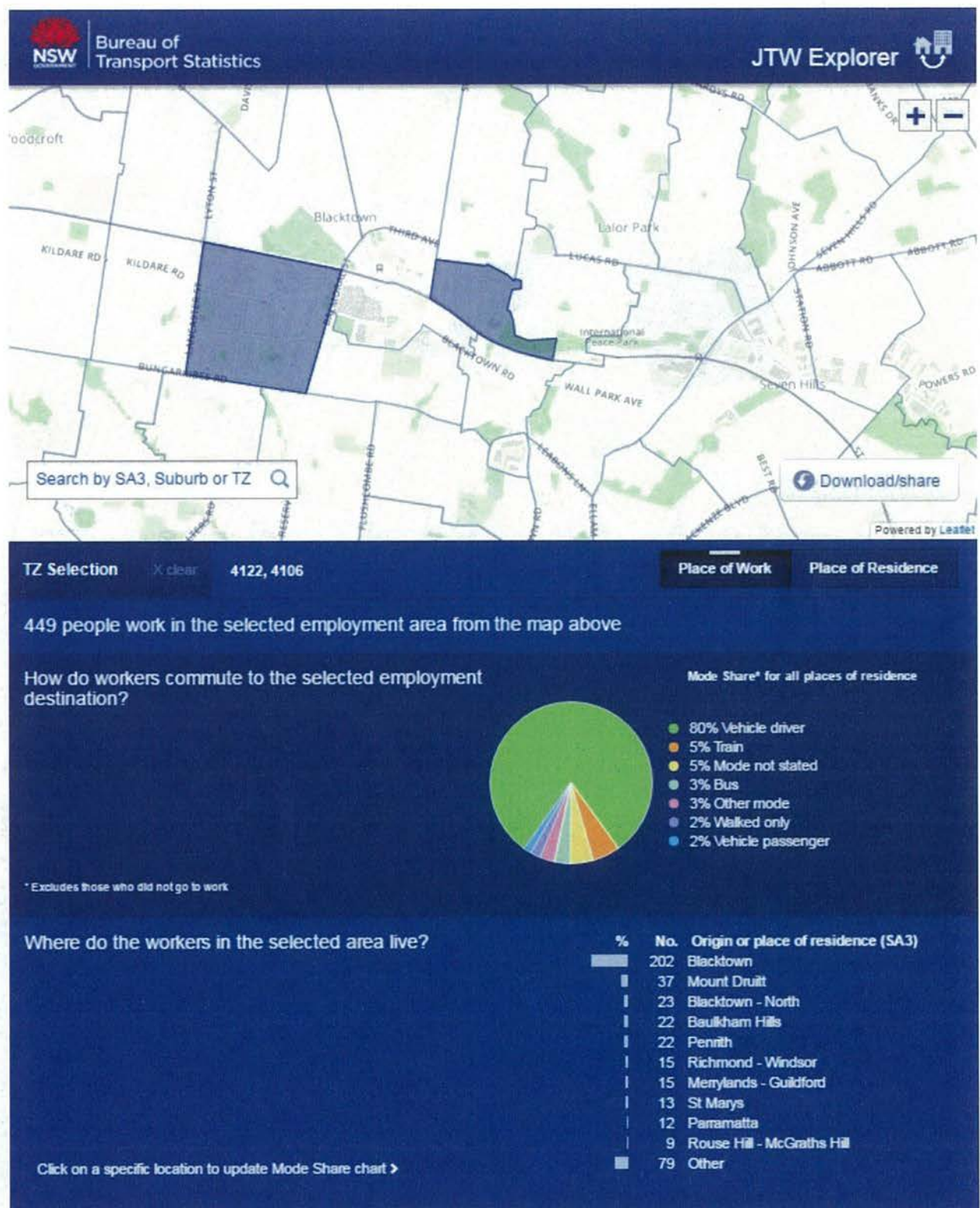


Figure 9 – Journey to Work Data, Bankstown. Residents commuting out.

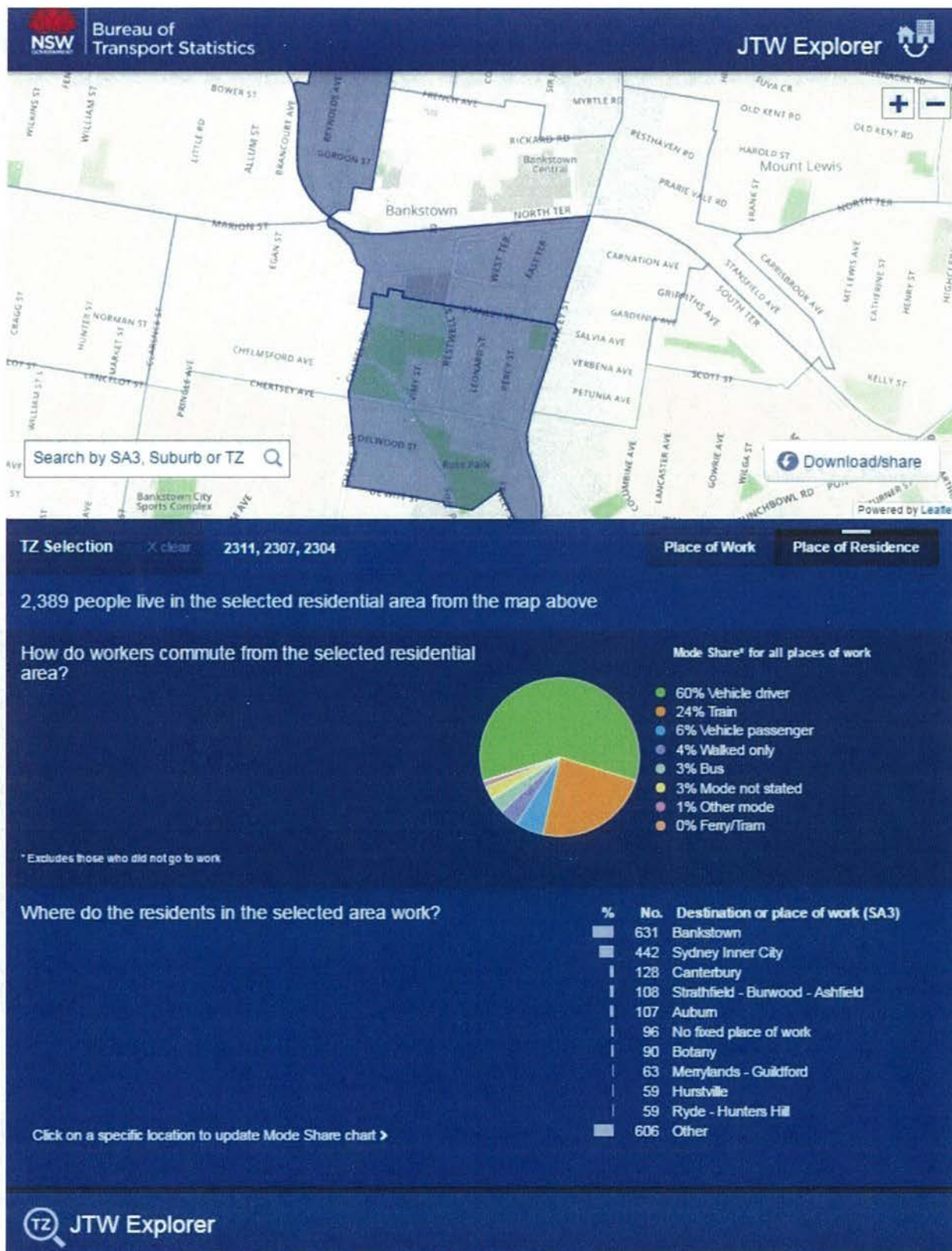


Figure 10 – Journey to Work Data, Bankstown. Workers commuting in.

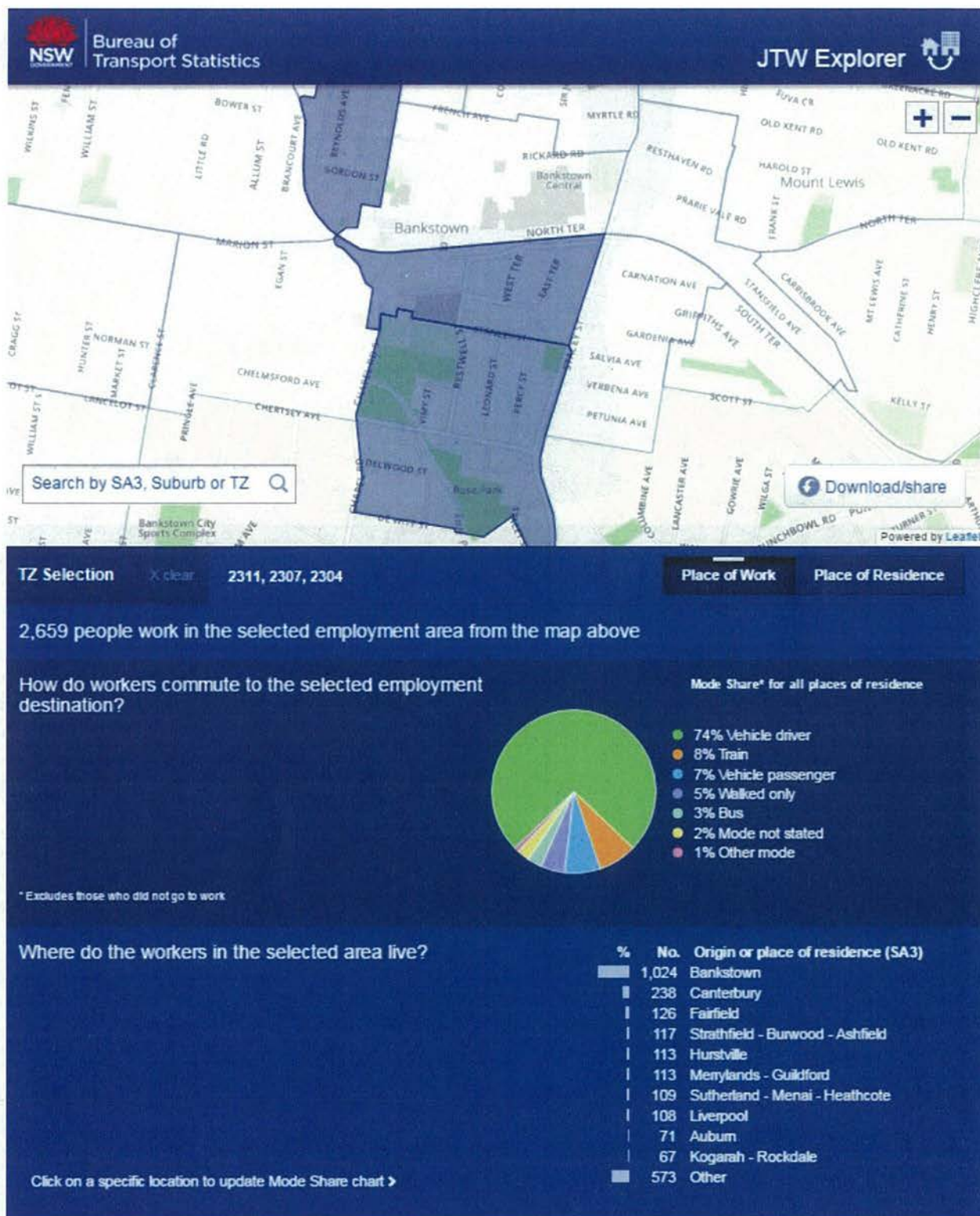


Figure 11 – Journey to Work Data, Parramatta. Residents commuting out.

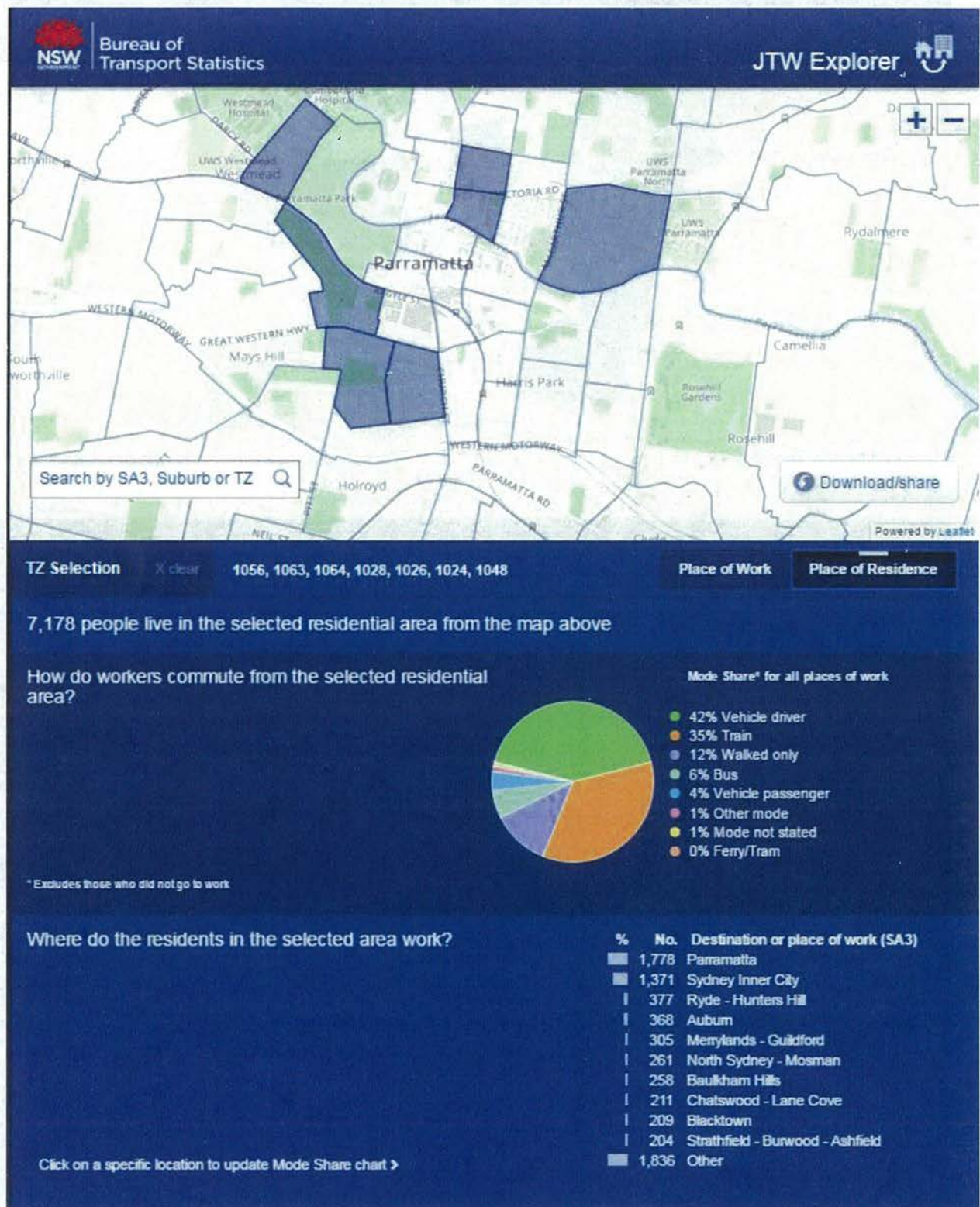


Figure 12 – Journey to Work Data, Parramatta. Workers commuting in.

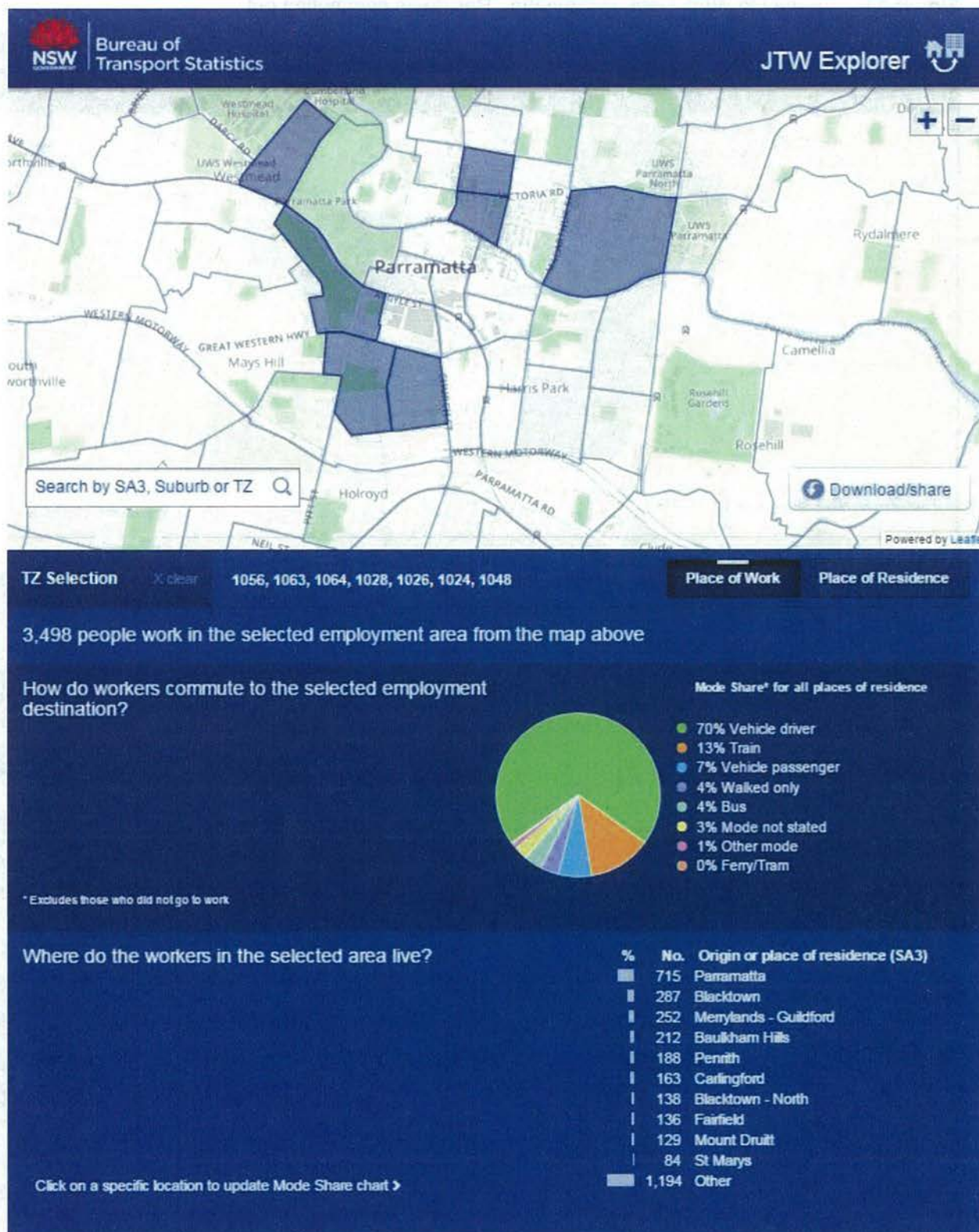


Figure 13 – TfNSW projections for population and employment in the Liverpool City Centre.

