Department of Economic Development, Jobs, Transport and Resources

Western Distributor

Western Freight Impact Assessment

November 2015

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1. Introduction

1.1 Purpose

The purpose of this report is to:

- Provide background information on the current Inner West freight transport network, its current restrictions and issues relevant to current and future freight demands;
- Identify the potential impacts on truck movements associated with the Western Distributor project (the Project – see Section 3 below); and
- Identify options for the ongoing management of the freight network to support key objectives identified within the Project and supporting local business and community outcomes.

2. Existing Conditions

This section outlines key characteristics of Melbourne's fright industry with respect to the Inner West and western road networks that to connect with the Port of Melbourne and other city gateways. The summary includes local freight networks and broader heavy vehicle networks relevant to the efficiency of Melbourne's logistics industry and international trade.

2.1 Freight Industry Trends

The freight industry is a highly competitive sector of the economy with relatively low margins and limited differentiation between participants. There is a relatively low entry cost to commence operations within the industry which provides for large numbers of new entrants at the lower end of the market competing directly with larger companies for some business needs.

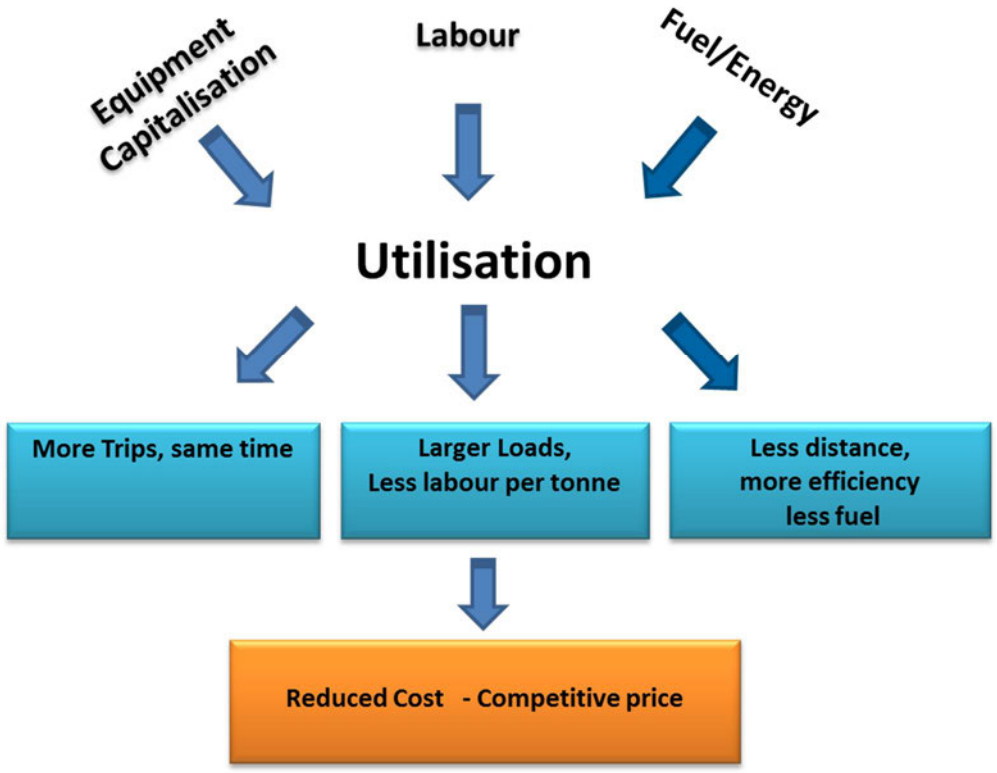
The industry is typically driven by competitive prices and the quality of services (often driven by innovation), particular customer requirements and available demand.

There are three key cost inputs to the majority of freight/logistics operations:

- Capital investment in equipment or systems (including land access);
- Labour; and
- Fuel / Energy

The ability to provide a more competitive price is driven largely by how well these inputs are managed, the services which can be developed from these inputs and alignment to available demand. As indicated in Figure 1 below, greater utilisation of resources drives lower costs and a more competitive market price.

Figure 1 Freight industry cost drivers



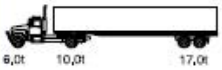
As a result of competitive pressures in the industry, logistics companies are extremely sensitive to efficiency and utilisation factors which impact their major cost inputs. Companies rely on transport management systems to ensure their route choices, time of travel and the size of loads maximises the use of equipment, labour and fuels.

These factors have driven changes in all aspects of equipment used in the industry including:

- Shipping industry trends;
- Container design has progressively moved from 20 tonne load-rating to in excess of 34 tonne in some cases, as well as an increasing trend for high cube containers (9 foot 6 inch high containers as compared with standard 8 foot 6 inch high containers);
- Heavy truck configurations moving from semi-trailers to B-Doubles and now a range of A-Double, B-Triple, HPFV and specific performance based standards for alternative configurations;
- Heaver handling equipment to lift larger loads less often;
- The introduction of detailed ICT systems to maximise utilisation and provide least cost outcomes for the whole of transport task; and
- More fuel efficient vehicles and the removal of older fleet vehicles which do not provide the same savings as Euro 4 and Euro 6 vehicles.

As a result, logistics operators are seeking to use larger volume and capacity (mass) trucks to reduce the fuel and labour costs per tonne of freight carried and increase their competitiveness in the market. A movement towards the larger configuration vehicles depicted in Figure 2 below also indicates a trend toward vehicles which currently are restricted to specific approved routes and times (shaded green in the figure).

Figure 2 Truck configurations and access

General Mass Limits			Higher Mass Limits (Road Friendly Suspension)		
Vehicle Type Column 1	Mass limit (tonnes) Column 2	Local Road Access Column 3	Vehicle Type Column 1	Mass limit (tonnes) Column 2	Local Road Access Column 3
	15.0	Yes		16.0	Yes
	22.5	Yes		23.0	Yes
	31.5	Yes		33.0	Yes
	39.0	Yes		40.0	Yes
	42.5	Yes		45.5	Approved routes
	50.0	Yes		57.0	Approved routes
	55.5	Approved routes		57.0	Approved routes
	59.0	Approved routes		62.5	Approved routes
	62.5	Approved routes		68.0	Approved routes

(Note: White shaded cells represent general access to the road network; green shaded cells require approved routes)

2.1.1 Industry Needs

At the current time, suburban freight around Melbourne is carried exclusively by road carriers and traffic data indicates that approximately two thirds of all truck traffic into the Port/Dynon Precinct is container traffic. Some 12,000 vehicles per day travel to and from the Port Precinct each day from the West of Melbourne and 20-25% of these vehicles travel via the West Gate Bridge (source: PoMC).

Many of the logistics providers are located within close proximity to the Port which provides for reduced travel costs and efficient transport movements to and from the Port. However, as population and traffic volumes increase, land values will also increase, leading to a potential relocation to new development areas further into the western precincts where land is cheaper.

Logistics providers are generally in need of three key criteria to ensure their businesses remain effective:

- Unfettered access to freight nodes through an efficient freight network;

- Sufficient capacity in network links and connections to meet growth requirements and minimise delays; and
- Efficient and reliable travel times on the network to make the right choices to maximise the efficiency of the use of their assets.

These issues are all critical to the cost of service delivery and are key aspects in the supply chain. Where failures in these elements occur, the results typically flow through to logistics operators, business and the community.

To maximise the efficiency of the freight network, each of these elements need to be considered in relation to:

- Current needs and capacities;
- Future growth scenarios based on the implementation of the Project;
- Future growth scenarios based on implementation of the Project plus future additional infrastructure (such as a connection to the Eastern Freeway) which may alter future modelling outcomes; and
- Planned future land used in the Port/Dynon Precinct.

The competitive nature of the industry drives the use of lowest cost options which align to direct routes with less kilometres travelled, unless, however, traffic impacts add time (and cost) to the journey. The use of off-peak times for many trips eliminates the traffic impacts and draws a focus on direct routes and use of freeways for longer delivery journeys.

The focus on minimum trip time and lower cost (reduction of labour and fuel costs) are relevant to all aspects of the logistics industry and freight strategies can directly impact decision making and change traffic flows if cost inputs are altered.

Travel times on the existing network typically drive the behaviours of logistics providers and can impact directions of travel and business outcomes. They are important to provide a basis for consideration of likely travel choices by the industry to and from their specific locations.

2.1.2 Port of Melbourne Interface

The Port of Melbourne is expected to significantly expand in container capacity between now and 2040. DP World and Patrick international container terminals are expected to increase their combined capacity from [redacted] TEU per annum, while Webb Dock could possibly increase capacity to [redacted] TEU per annum subject to the Port of Melbourne Lease transaction and the new operator of the Port.[1] The relocation of the Melbourne Wholesale Fruit Vegetable & Flower Market to Epping frees up space for potential transport logistics use (depots, truck marshalling and empty container parks).

Overall, truck movements at the Port Precinct are expected to increase significantly from nearly 10,000 in 2012.

As the Port of Melbourne plays such an important role in the economy of the State and as a gateway for South Eastern Australia, the interfaces with the Port form a key element of the freight network and are critical to support efficient practices within the logistics industry and international trade.

Key issues required to support the Port operations include:

- Sufficient modelled traffic capacity including the interface and consideration of mainstream passenger traffic;

[1] Previous Port of Melbourne and Government studies (including VFLP)

- Road pricing and regulation ensuring traffic is incentivised to use appropriate corridors and roadways rather than residential streets;
- Capacity and capability is provided for existing heavy vehicles and future planned vehicles servicing the Port and logistics industries. Based on the trend for increasing vehicle size and capacity there is a need to consider future expectations in this area;
- Consideration for current and potential increased fuel truck traffic in the Yarraville Precinct and other freight traffic from neighbouring areas; and
- Efficient access to the Port through access roadways with capacity free of excessive queuing or congestion.

2.1.3 Staging of Loads to/from Port of Melbourne

The 2009 Origin Destination Study undertaken by the Port of Melbourne identified that a large percentage of first move road transfers from the Port were to nearby logistics depots (almost 80%). This highlights the links and staging which is used to obtain the most efficient truck for the task and the ability to use larger trucks in the Port Precinct. Staging is also used to align logistics operators' delivery timeframes with normal business hours for relevant industries.

Table 1 below indicates the mix of container movements to and from the Port of Melbourne.

Table 1 Movement of container traffic to / from Port of Melbourne

Transfer mode	Imports	Exports
Direct transfer by truck	23%	48%
Staged transfer by truck	77%	52%
Rail transfer	5%	20%

Source POMC 2009 O/D study

This data also highlights the opportunity to reduce overall truck numbers in the broader network by utilising HPFVs and larger truck configurations across a wider network.

2.1.4 Empty Container Parks

There are in excess of 10 major empty container parks, which are an essential part of cargo supply chains and significant generators of truck traffic in the Inner West.

Empty container parks are typically highly marginal businesses, and are therefore susceptible to changes in operating costs such as rent (land value) or transport costs (between the container park and the Port). The focus for site locations has historically been based on cheap land rental and ease of access (with minimal distance and travel times) to the Port.

These container parks operate on behalf of shipping lines in that they receive empty container returns from importers and supply empties to exporters before any imbalances are typically returned to the Port for export. The cost of returning the container to the Port is borne by shipping companies that operate the containers and costs are reduced if the container park is closer to the Port. Returns of empty containers to the Port are often part of a 'bulk-run' where up to 200-300 empty containers may move over a short period of time (an 8 hour shift) to fill empty available space on a departing ship.

As a result the majority of empty container parks are in the general area of the Tottenham Precinct and utilise the road corridors of Francis Street, Somerville Road and Geelong Road /Moore Street to return containers to the Port for export.

There are additional empty container parks which are shipping company owned that are strategically placed near the Port (Mediterranean Shipping's CC container park) or seeking alternative options in the Altona area (Maersk Line).

As container volumes through the Port of Melbourne increase and land values rise in the Inner West, some of these businesses may be forced to relocate further west into other industrial precincts away from the Port of Melbourne. Traffic impacts will increase through distance travelled and number of trips.

Additionally, the potential imposition of extra tolls or potential changes to truck curfews which increase transport costs may force businesses to relocate to more suitable locations.

2.1.5 Container Size

The long term trend in containerised freight is of increased mass tonnes based on stronger and more flexible equipment. The original 20 foot (6.1 m) containers were based on a 20 tonnes Gross Mass Limit (GML) and this has grown in standard international containers (ISO containers) to 30.480 tonnes GML for 20 foot containers. Forty foot (12.2 m) containers are usually loaded to a lighter GML due to the difficulty of loading longer standard containers. The GML for standard 40 foot containers is also 30.480 tonnes however some specialist containers now exceed this limit.

Figure 3 20ft and 40ft containers - 30.480 tonnes

Rail containers in the Australian domestic market vary in length up to approximately 53 feet (16.15 metres) and up to 34 tonnes GML.

Figure 4 Rail containers GML 34 tonnes

Additionally, an increasing trend for high cube containers (9 foot 6 inch high containers as compared with standard 8 foot 6 inch high containers) is emerging with the container trade market, which has particular impact on bridge clearance heights.

The trend towards heavier loads and greater capacity in containers aligns to the logistics industry needs for more efficient outcomes and a cost competitive advantage in a highly competitive industry. The increasing container weights coupled with efficiency measures leads to further innovation and trends towards changes in truck configuration (to carry larger containers) and broader design advantages.

2.1.6 Access for Larger Vehicles

The increased tonnage and efficiency of larger truck configurations is a key issue and opportunity for the logistics industry and provides for reduced costs in the supply chains and subsequent improved international competitiveness.

The increased use of larger truck configurations may be applied to new infrastructure as it is designed and built, however there will be a need to assess a balance between the cost of road and bridge capacities and the ability to utilise larger vehicles. Ideally the currently available vehicles should have access to the major industrial/logistics precincts inclusive of:

- Trucks currently utilising the Port related network;
- HPFVs (as indicated in Section 2.3.1); and
- Selected vehicles under the Performance Based Standards (PBS) scheme.

2.2 Freight Land Use

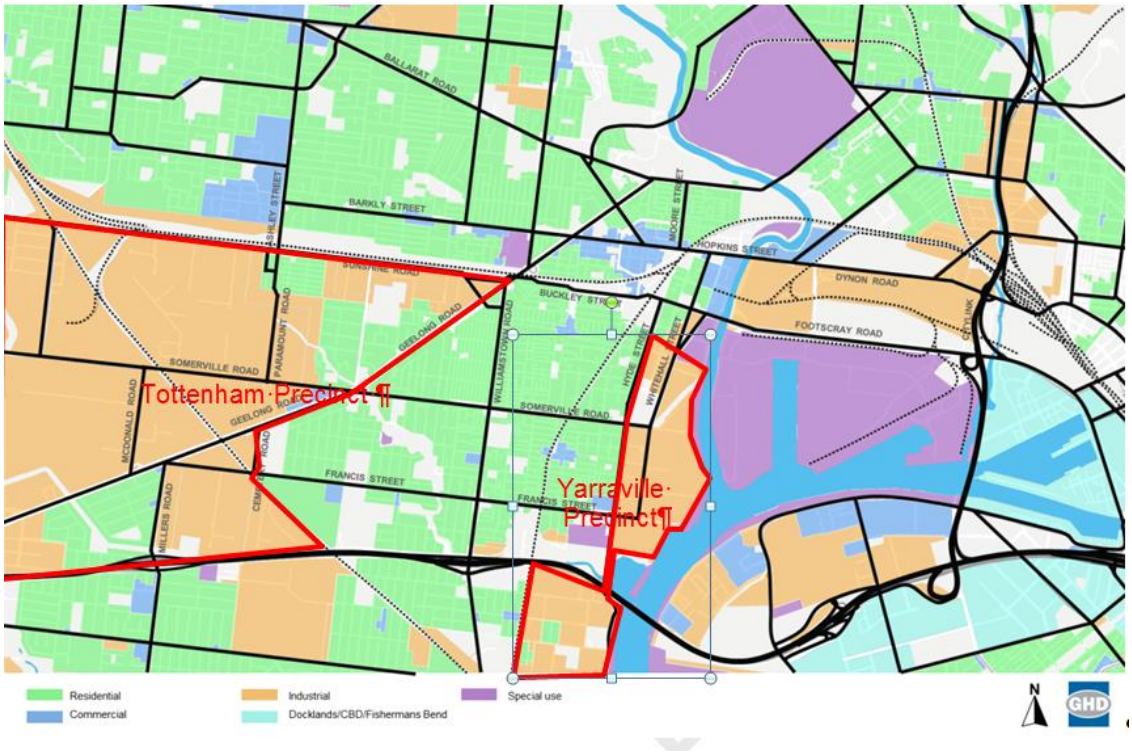
The map in Figure 5 presents the current land uses in the Inner West. As displayed on this map, the Inner West area contains a wide range of land uses. The green areas identify residential use within the Inner West and this is surrounded by a mix of industrial and commercial uses which are displayed in orange and blue.

In the coming years, it is anticipated that land use changes will push freight and port related businesses further west away from the Port of Melbourne. It is therefore vital that sufficient infrastructure is in place to facilitate the growing number of freight movements between the Port of Melbourne and the West.

Within the municipality of Maribyrnong, there are an estimated 6,200 businesses and many of these businesses provide significant employment to local residents. The two largest precincts of Yarraville and Tottenham provide up to 9,000 jobs.[2]

[2] www.maribyrnong.vic.gov

Figure 5 Inner West land use



2.2.1 Yarraville Precinct

Urban renewal in the Inner West, namely the Footscray and Yarraville areas, is accelerating land use change and increasing the residential population. As a result, these developments are shifting the purpose of a number of local arterial roads, such as Buckley Street and Francis Street, altering with their current use as primarily truck routes.

- Buckley Street is zoned mixed land use and is part of the Footscray Activity Centre. Maribyrnong City Council is developing the area as a medium density precinct, with apartments between two and six storeys being built along the length of road;
- The redevelopment of the old Bradmill industrial site on Francis Street is expected to include a significant number of additional dwellings and sizeable retail and commercial development. This development, which may occur within the next decade, may include residential properties facing Francis Street, currently a major truck route.

As the residential population grows along these roads, there will be an expectation from the community that amenity will not be as adversely affected by truck volumes.

2.2.2 Tottenham Precinct

The Tottenham Precinct has historically been more highly focused on industrial development, however, increased development to the west of Melbourne is increasing land prices in areas closer to the city. Adjoining areas to the north of Tottenham, including Sunshine, are increasing in value with further redevelopment and increasing pressure on industrial land use.

Changes of this nature could also occur in the Tottenham Precinct in future years, driving a possible change to higher value land use and potential changes from the existing industrial environment.

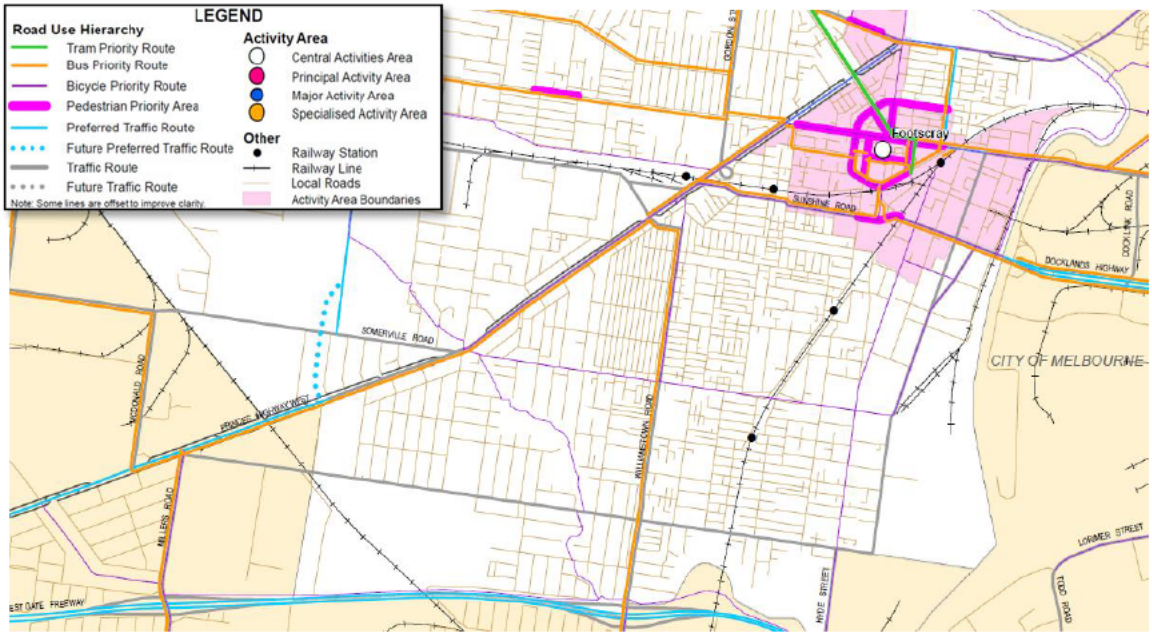
2.3 Freight Transport Network

Transport networks in the Inner West are managed by both VicRoads and the local councils, including Maribyrnong, Brimbank and Hobson's Bay. These Inner West areas have provided key access routes to the Port of Melbourne over recent decades during a period of significant growth in both Port and City related traffic.

As a result of growing traffic volumes, curfews have been applied on some routes (Francis Street, Somerville Road and Moore Street) and B-Double (or greater) truck bans have been applied to Hyde Street to address residential amenity impacts in these areas. The following sections provide further detail on these networks.

The Inner West Network Operating Plan for the City of Maribyrnong, shown at Figure 6, deems Central Footscray as a pedestrian priority area with major roads such as Williamstown Road and the Princes Highway designated as Bus Priority Routes.

Figure 6 Inner West Network Operating Plan



The wider road networks have been the subject of a wide range of project assessment to cater for the growing development areas in the Western Suburbs and major industrial and freight movements. The general network caters for vehicles up to B-Double configurations, connecting the freight precincts and regional traffic to the City and the Port/Dynon Precinct, subsequently acting as a major gateway for the State. Access for larger truck configurations, such as High Productivity Freight Vehicles (HPFV), is provided in overlays of the road network where specific truck configurations can operate. These include:

- A HPFV Cubic Freight Network;
- A HPFV mass based network; and
- A container vehicle network (for local Port traffic).

The trend toward larger and more efficient truck configurations is an important progression that ensures Victoria's supply chains remain internationally competitive. The resulting requirements flow through to road infrastructure network, which therefore need to accommodate changes to allow for these increases in efficiency and supply chain improvements to be realised.

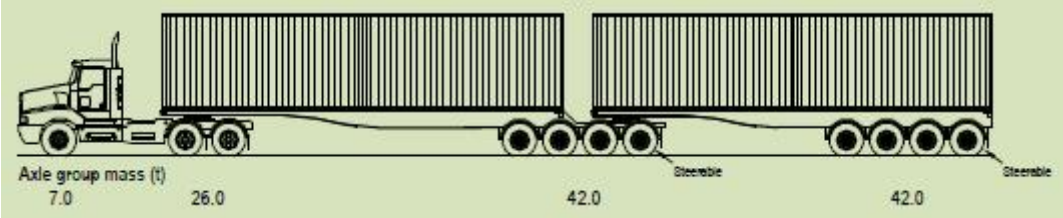
As Victoria's freight task increases in the coming years, the State's road network is set to become significantly more congested due to growth in truck traffic. Since the introduction of B-

Doubles on the road network in the late 1990s, the volume of freight transported by road has more than doubled (*Moving More With Less – VicRoads*). In order to accommodate the growing freight task and allow businesses to remain economically competitive in the marketplace, the State needs to support the adoption and wider rollout of HPFVs on the road network.

2.3.1 HPFV Network

HPFVs are heavy vehicles larger than a standard 26 metre B-double, capable of carrying larger and heavier loads. A HPFV, such as a super B-double (shown in Figure 7), has the ability to carry two 40 foot containers or four 20 foot containers compared with the three 20 foot container capacity of a B-double.

Figure 7 Super B-Double example



Current VicRoads guidelines limit the size and mass of HPFVs on the metropolitan Melbourne network to 30.0 metres in length and 68.5 tonnes in weight, while operations in regional Victoria are limited to 36.5 metres in length and 68.5 tonnes weight. In addition, there are also individual axle group mass limits which must not be exceeded. Transport operators can apply to operate HPFVs exceeding 68.5 tonnes and up to 77.5 tonnes with approvals granted on a case by case basis.

HPFVs must also be approved under the national Performance Based Standards (PBS) scheme, participate in the Intelligent Access Program (IAP) and travel at no greater than 90 km/h.

Performance Based Standards (PBS) Scheme

HPFVs are required to obtain permits from the National Heavy Vehicle Regulator (NHVR) before accessing the road network under the Performance Based Standards scheme. This scheme aims to achieve higher productivity and safety through innovative and optimised vehicle design. Vehicles are tested against 16 safety standards and four infrastructure standards to ensure that the vehicles are suitable for the road network and are safe. PBS approved vehicles are considered to be Class 2 Heavy Vehicles.

HPFV Cubic Freight Network

VicRoads have designated a Cubic Freight Network, which allows HPFVs with an overall length greater than 26 metres, provided the Gross Combination Mass does not exceed 68.5 tonnes. As the majority of road freight is volume-limited, increasing the maximum allowed length from 26 to 30 metres allows more freight to be carried within the existing regulatory mass limits, increasing productivity without upgrading the strength of the road network.

The Cubic Freight Network covers the majority of the State's freeways including:

- Princess Highway;
- Western Freeway;
- Calder Freeway;
- Hume Freeway;
- Monash Freeway;

- CityLink;
- EastLink;
- M80 Ring Road; and
- The West Gate Freeway.

A map of the HPFV Cubic Freight Network[3] is included at Figure 8 below:

Figure 8 HPFV Cubic Freight Network

Approved Metropolitan HPFV Routes (Mass Based)

VicRoads have additionally approved HPFVs on a number of routes (shown in Figure 9):

- Super B-Doubles up to 30 metres in length and 77.5 tonnes GVM between the Port of Melbourne and the Somerton intermodal rail terminal (based on a trial of HPFV traffic);
- Super B-Doubles up to 30 metres in length and 77.5 tonnes GVM between the Port of Melbourne and Tottenham (Rocke Brothers and FBT Transwest);
- B-Triples up to 33.5 metres in length between the Ford Motor Company's Geelong and Broadmeadows plants; and
- Super B-Doubles between the Port of Melbourne and Dandenong South (Wettenhalls Logistics Specific Permit).

[3] VicRoads Heavy Vehicles Moving More with Less.pdf

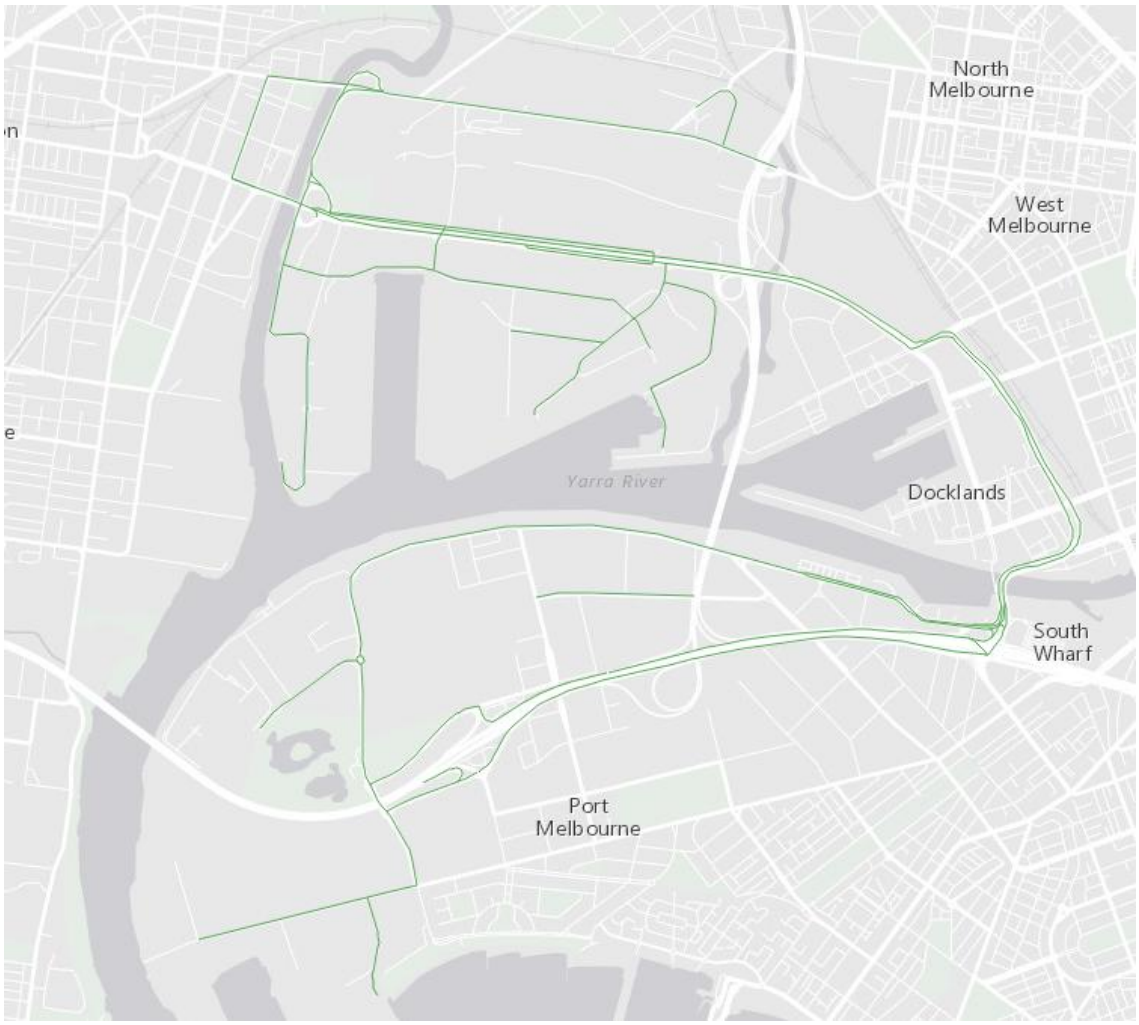
Figure 9 HPFV Mass Based[4] Routes

Container Vehicle Network (Local Port of Melbourne Traffic)

A Container Vehicle Network (for local Port of Melbourne traffic) provides for the movement of containers on larger configuration vehicles within defined routes around the Port and providing connection between the Swanson and Webb Dock Precincts operated by the Port of Melbourne. On this network, 30 metre HPFVs (Super B-doubles) with a gross vehicle mass of up to 109 tonnes are licensed to travel between Webb Dock, the Dynon Rail Precinct and the Swanson Precinct via Footscray Road, Wurundjeri Way, Lorimer Street and Todd Road, as shown in Figure 10.

[4] VicRoads Heavy Vehicle Moving More with Less plus permitted movement (dotted line)

Figure 10 Container Vehicle Network (local Port of Melbourne traffic[5])



2.3.2 HPFV Network Restrictions

The existing road network does not allow for the optimised use of HPFVs due to the inherent restrictions in place. These include restrictions to vehicle mass and height, as well as authorised travel routes in the form of curfews, outlined in further detail below.

Mass Limitation

As discussed above, Victoria's existing B-double network is suitable for the general operation of vehicle combinations with an overall length of up to 26 meters and a Gross Combination Mass of up to 68.5 tonnes, with limited HPFV approved routes allowing vehicles of up to 77.5 tonnes (mass based on specific permits) to operate on the metropolitan road network.

The mass based network is relatively limited compared to other states such as Queensland, in which combinations at 85.5 tonne GVM are allowed to operate from Toowoomba to the Port of Brisbane; 85 tonnes is considered to be the optimum design weight for A-doubles.

Much of Victoria's existing bridge infrastructure is over 30 years old, and is subject to weight restrictions. When restrictive weight limits are placed on bridges, it forces freight trucks to detour to less efficient routes or split loads to smaller less efficient trucks, and reduces business and industry productivity.

[5] www.vicroads.vic.gov.au

There are a number of schemes in place to address the retrofit task; the Australian Government's Bridges Renewal Programme (BRP) and National Highway Upgrade Programme (NHUP), and a number of other projects to strengthen weakening bridges on arterial roads in Victoria that fall outside the scope of the national programmes.

It is anticipated that proposed bridge strengthening of the West Gate Freeway between the M80 interchange and Williamstown Road (undertaken within the Project) will accommodate up to 110 tonne loads and enable more productive and efficient vehicles to be used across the freeway network. Additionally, the M80 is progressively being upgraded to accommodate higher productivity trucks.

Truck Curfews

Figure 11 shows existing truck curfews in the Inner West. There are curfews in operation on Francis Street, Somerville Road, Hyde Street and Moore Street.

Figure 11 Existing Inner West truck curfews

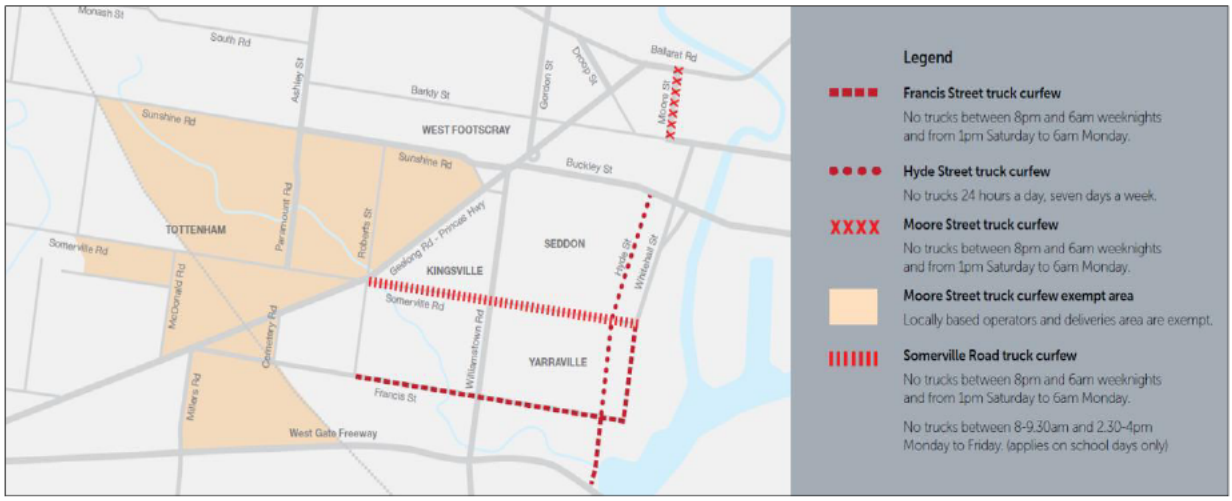
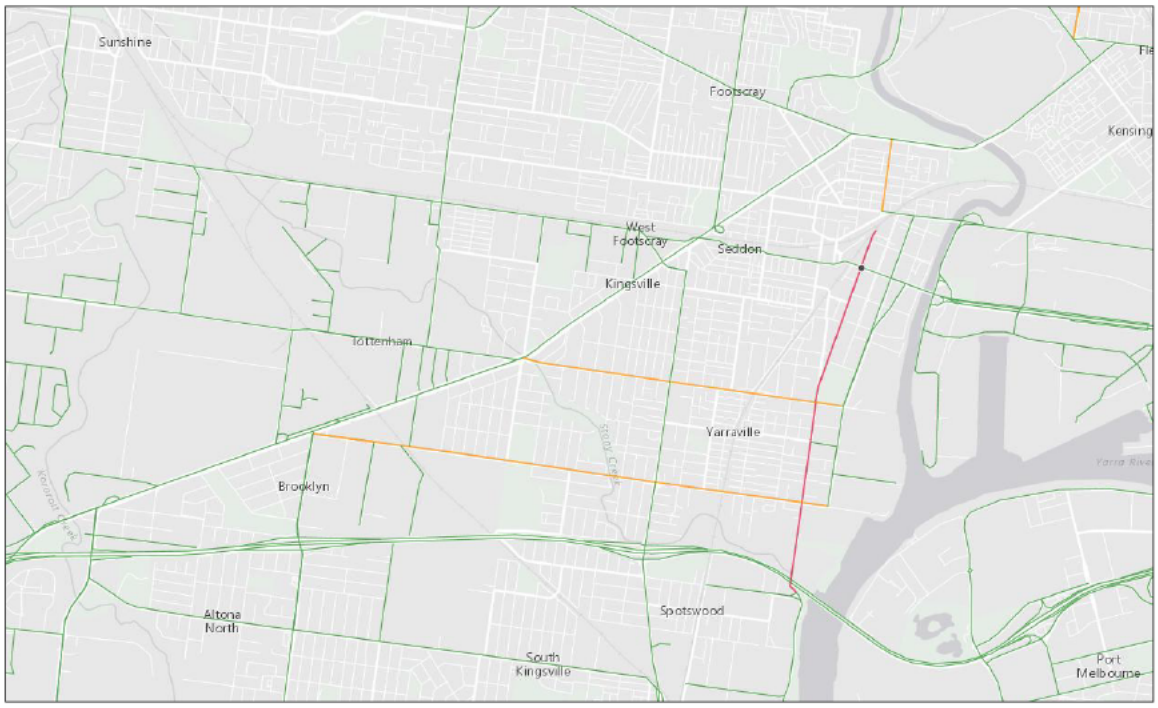


Figure 12 shows the gazetted roads for B-Double trucks in the Inner West area. The roads are shaded as follows:

- Green – these roads do not have any B-Double restrictions;
- Orange – these roads have restriction on B-Double use; and
- Red – B-Double trucks are banned from these routes.

Figure 12 Existing B-Double network



https://vicroadsmaps.maps.arcgis.com/apps/Viewer/index.html?appid=cfce8ddeb77f43d781622d3f013fb4d7

Bridge Heights

Several of the bridges in the Inner West local networks provide only restricted height access and this is critical to the use of these access routes by larger trucks.

Figure 13 shows vehicle height limits on roads in the Inner West study area. It can be seen that there are several routes with height restrictions including Buckley Street in Footscray with a low railway bridge restricting the types of vehicles that can use this route. This is significant when considering there is an increasing trend for high cube containers (9 foot 6 inch high containers as compared with standard 8 foot 6 inch high containers) that are not able to use certain routes, including Buckley Street.

Figure 13 Existing height limits for vehicles

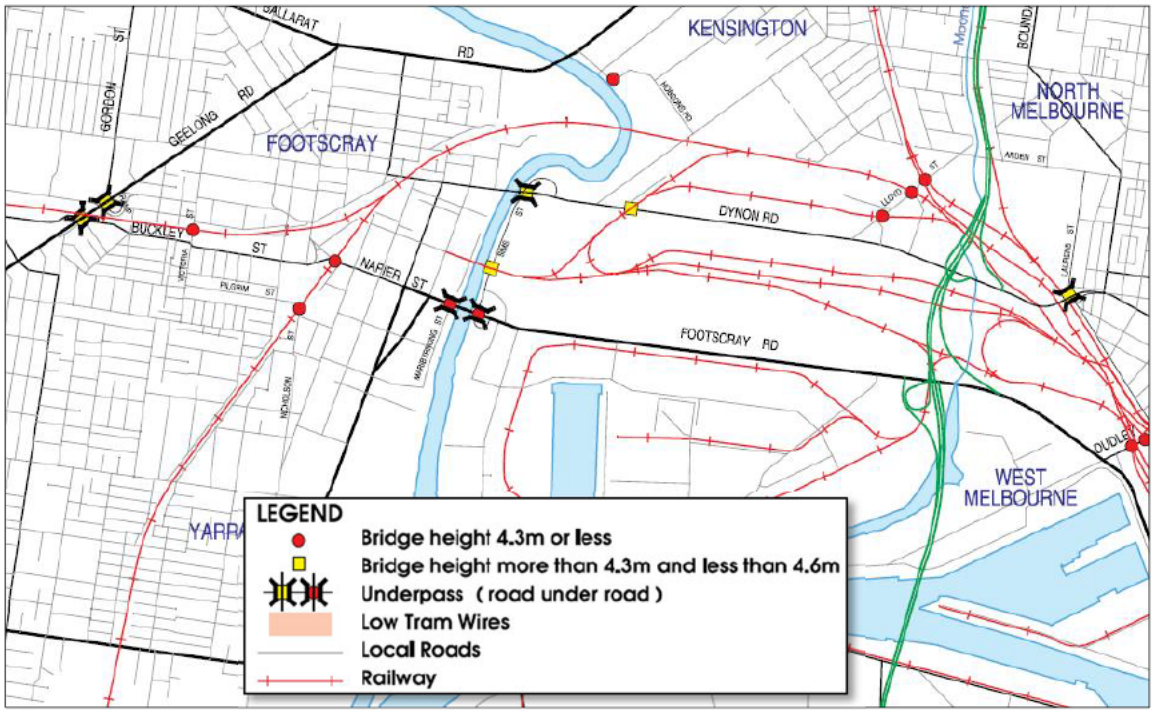


Table 2 provides a summary of the road use priorities, B-Double restrictions and height limits impacting vehicles for the major roads in the Inner West.

Table 2 Summary of major roads in Inner West

Road Name	Road Use Priorities	B-Double Approved (Y/N)	Height Limits
West Gate Freeway	Preferred Traffic Route	Y	-
City Link	Preferred Traffic Route	Y	-
Footscray Road	Preferred Traffic Route Bus Priority Route Bicycle Priority Route	Y	-
Dynon Road	Traffic Route Bus Priority Route Bicycle Priority Route	Y	Rail underpass (4.3m-4.6m)
Sims Street	(Local road)	Y	Footscray Road underpass (<4.3m) Dynon Road underpass (4.3m-4.6m)
Mackenzie Road	(Local road)	Y	-
Dock Link Road	Traffic Route	Y	-
Appleton Dock Road	(Local road)	Y	-
Napier Street	Traffic Route Bus Priority Route Bicycle Priority Route Pedestrian Priority Area (Footscray Activity Area)	Y	Rail underpass (<4.3m)

Road Name	Road Use Priorities	B-Double Approved (Y/N)	Height Limits
Buckley Street	Traffic Route Bus Priority Route Bicycle Priority Route Pedestrian Priority Area (Footscray Activity Area)	Y	-
Moore Street	Traffic Route Bus Priority Route	Y (with curfews)	-
Somerville Road	Bicycle Priority Route	Y (with curfews)	-
Francis Street	Traffic Route	Y (with curfews)	-
Whitehall Street	Traffic Route Bicycle Priority Route (Moreland Street to Somerville Road)	Y	-
Hyde Street	Traffic Route (Francis Street to M1) Bicycle Priority Route	N	-
Geelong Road	Preferred Traffic Route (M1 to Tottenham Parade, and Barley Street to Ballarat Road) Traffic Route (Tottenham Parade to Barkley Street) Bus Priority Route Bicycle Priority Route (Somerville Road to Ballarat Road)	Y	-
Ballarat Road (Racecourse Road to Moore Street)	Traffic Route Bicycle Priority Route	Y	-
Ballarat Road (Moore Street to Geelong Road)	Preferred Traffic Route Bicycle Priority Route Bus Priority Route	Y	-
Ballarat Road (west of Geelong Road)	Traffic Route Bicycle Priority Route (Geelong Road to VUT) Bus Priority Route Pedestrian Priority Area (VUT frontage) Tram Priority Route (Droop Street to Gordon Street)	Y	-
Williamstown Road	Traffic Route Bus Priority Route Bicycle Priority Route (Geelong Road to Somerville Road, and south of M1)	Y	-
Paramount Road	Preferred Traffic Route Bicycle Priority Route (Sunshine Road to Stony Creek)	Y	-
Grieve Parade (Geelong Road to M1)	Traffic Route Bus Priority Route	Y	-
Grieve Parade (south of M1)	Preferred Traffic Route	Y	-

Road Name	Road Use Priorities	B-Double Approved (Y/N)	Height Limits
Millers Road	Traffic Route Bicycle Priority Route Bus Priority Route	Y	-

Last Mile Access - Local Government Support

In order to reach a freight origin or destination, HPFVs may be required to travel along local government roads. Access on this section of road, often referred to as 'last mile' access requires approval from local governments.

However, local governments often have few incentives to support wider HPFV usage, due to on occasion community opposition to larger trucks and the community perception that the benefits of HPFVs mainly flow to the industry rather than the community. Additionally, some local governments have expressed concerns around the ability of network to cope with vehicles and the accelerated deterioration of pavements.

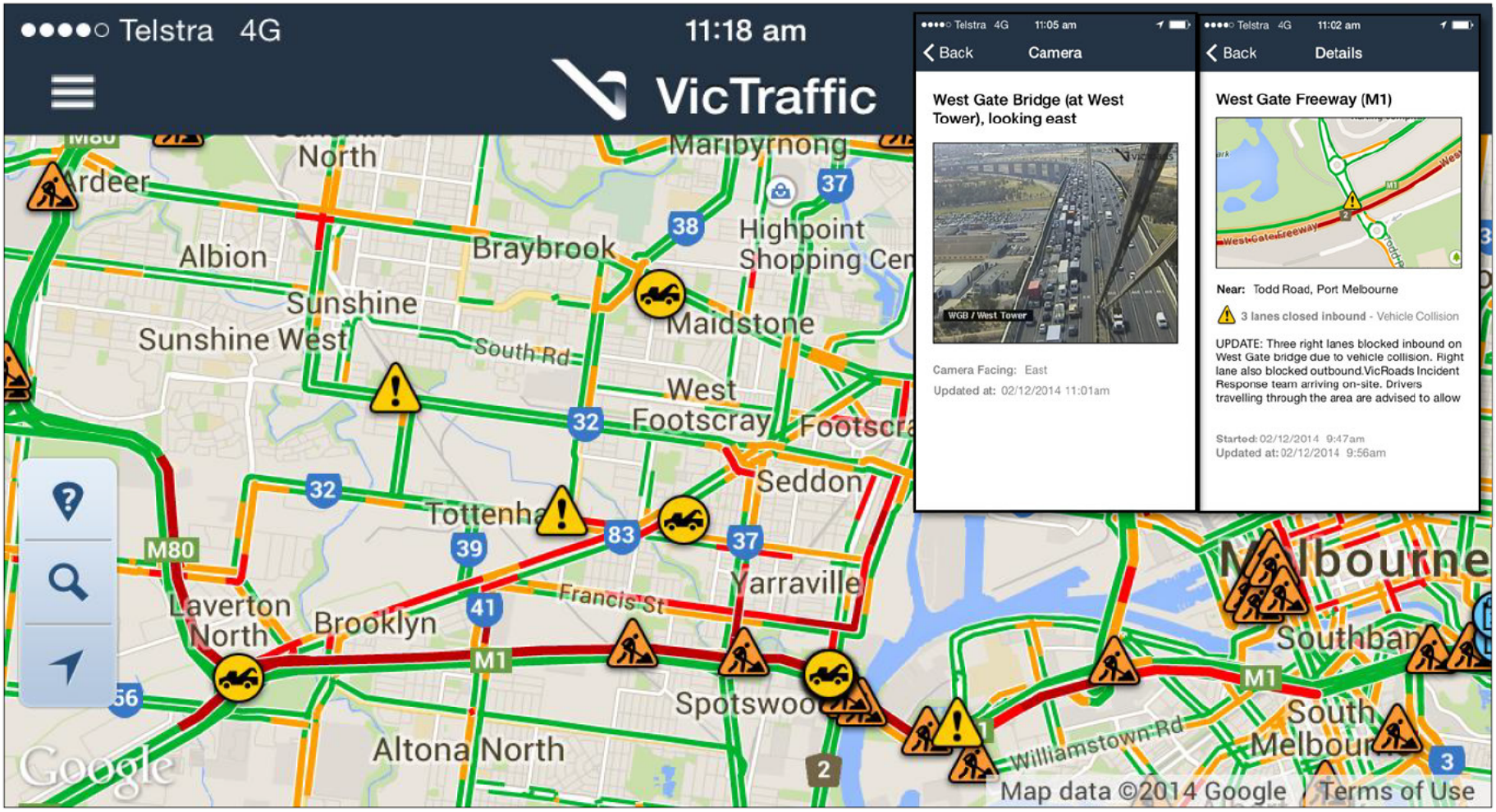
Fostering public acceptance of HPFVs by increasing the awareness of the benefits of HPFVs through greater education and developing adequate tools for local government to assess HPFV applications will be required to encourage industry to further invest in HPFVs.

2.4 Existing Freight Network Resilience

The screenshot shown in Figure 14 is a typical representation of what can happen to the network when an incident occurs on the West Gate Bridge.

This incident occurred during the inter-peak period, on Tuesday 2nd December 2014 in the eastbound carriageway on the West Gate Bridge, requiring the closure of 3 traffic lanes. As a result, traffic congestion extended along the M1 corridor and into the M80. Inner West roads including Geelong Road, Francis Street, Whitehall Street and Moore Street, were also highly congested at 11 am.

Figure 14 Incident on West Gate Bridge – Tuesday 2nd December 2014



Increasing Traffic Congestion

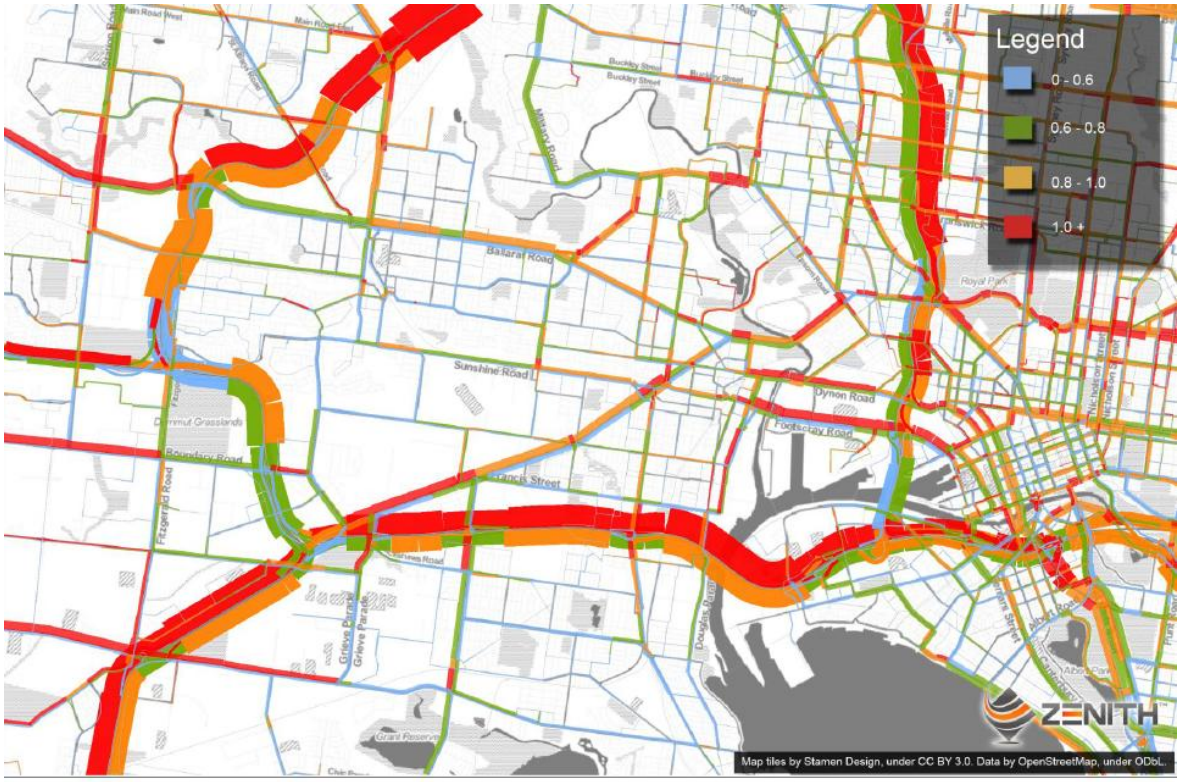
Figure 15 provides a strategic traffic model plot of forecast 2031 AM Peak period volume to capacity ratios, with over-capacity links highlighted in orange and red. The majority of roads are expected to be over-capacity by 2031, with V/C ratios above 0.8. The increase in traffic volumes experienced on the Inner West road network is expected to increase the length of delays and cause peak spreading.

The plot indicates that:

- The West Gate Freeway is reaching over the current prescribed capacity;
- This is impacting the adjoining arterial roads, with the M80 and Princes Freeway indicating over capacity volumes to the west of the West Gate Freeway;
- Geelong road indicating volumes at over 80% of prescribed capacity in this period in the area near to the West Gate Freeway; and
- A build-up of traffic on feeder roads to the West Gate Freeway at:
  - Grieve Parade;
  - Millers Road; and
  - Williamstown Road.

Increased development in the western suburbs of Melbourne and rising general traffic volumes are anticipated in future years, which in turn places greater pressure on the overall network and results in further congestion unless measures are implemented to ease the impacts.

Figure 15 2031 Base Case – AM Peak (7am-9am) Volume/Capacity Ratios



vlc Volume / Capacity Ratio - AM Peak (7am - 9am)
2031 State Revised Base Case

2.5 Existing Freight Movements

This section summarises existing freight movements in the Inner West study area. Data has been sourced from a number of different publically available documents including:

- Port of Melbourne and Dynon Rail Terminals 2009 Container Logistics Chain Study;
- Port of Melbourne Traffic Surveys (2013); and
- VicRoads Inner West Truck Surveys (2014).

2.5.1 Overall Industrial Precinct Overview

The western and northern industrial and freight precincts play a significant part in Melbourne's trade and economic fortunes providing freight staging and distribution locations relatively close to the port, the city centre and major arterial roadways for citywide distribution.

Suburban locations are the destination for 87% of imports through the Port of Melbourne[6] with traffic data indicating 73% of traffic specifically from the Port/Dynon Precinct moves to and from the western suburban areas[7]. Industrial and logistics precincts to the west also include the majority of Melbourne's empty container parks which stage and return these containers to the Port. These empty containers form the largest category of exports from the Port of Melbourne (approximately a third of all exports in 2013/14).

The major industrial and logistics precincts identified throughout this report are:

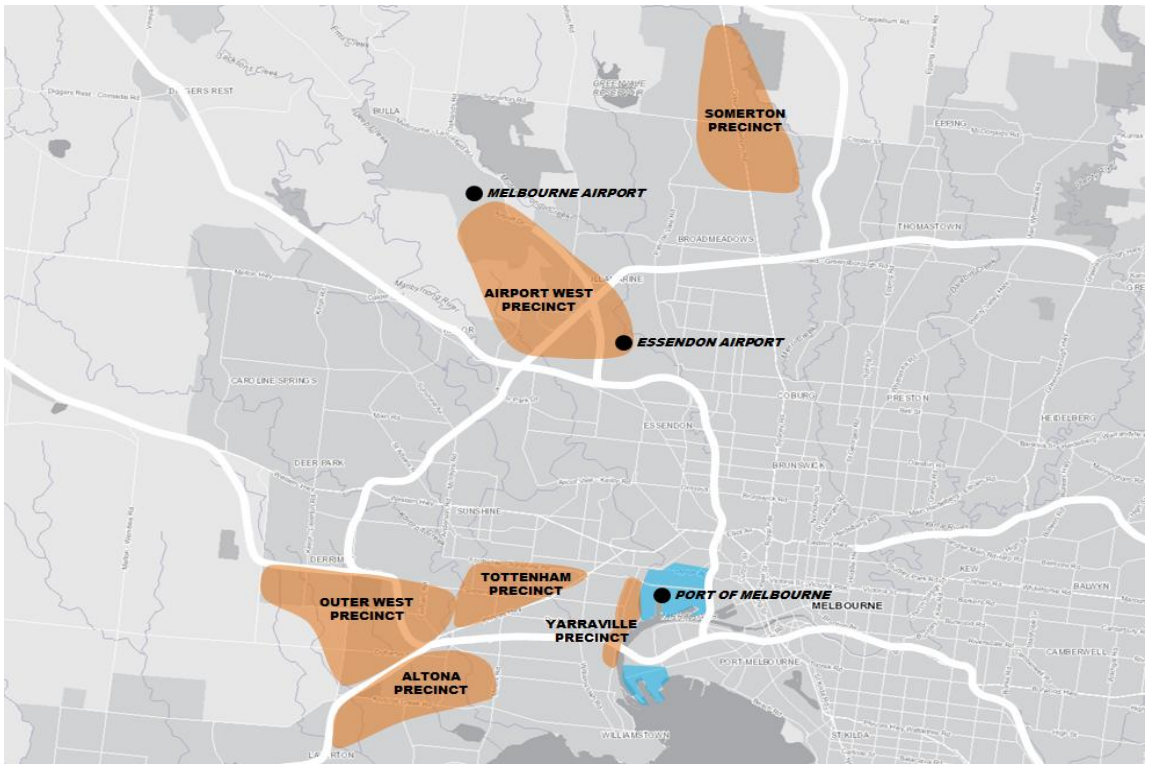
- The Tottenham Precinct (including areas west of Williamstown Road and inclusive of Brooklyn);
- The Altona Precinct (including Laverton);
- The Outer West Precinct (including Laverton North, Truganina and Derrimut); and
- The Yarraville Precinct – a mixed use precinct area with industrial and residential areas (including the area west of the Maribyrnong River and east of Williamstown Road.

The northern industrial/logistics precincts at Airport West and Somerton are also relevant to these issues as they often utilise the Western Ring Road and the West Gate Freeway to access the Port Precinct.

These precincts are outlined on the map included at Figure 16 below

[6] PoMC 2009 O/D study
[7] PoMC 2012 Traffic studies

Figure 16 Western and Northern Industrial Precincts



The West Gate Bridge currently carries around 24,000 to 28,000 trucks per day (approximately 12 per cent of total traffic volume). On the Inner West arterial road network, trucks represent between 10 to 30 per cent of total traffic, with roads often carrying around 2,000 and 3,000 trucks per day. Trucks travelling along these roads are often at conflict with the residential land uses in the area.

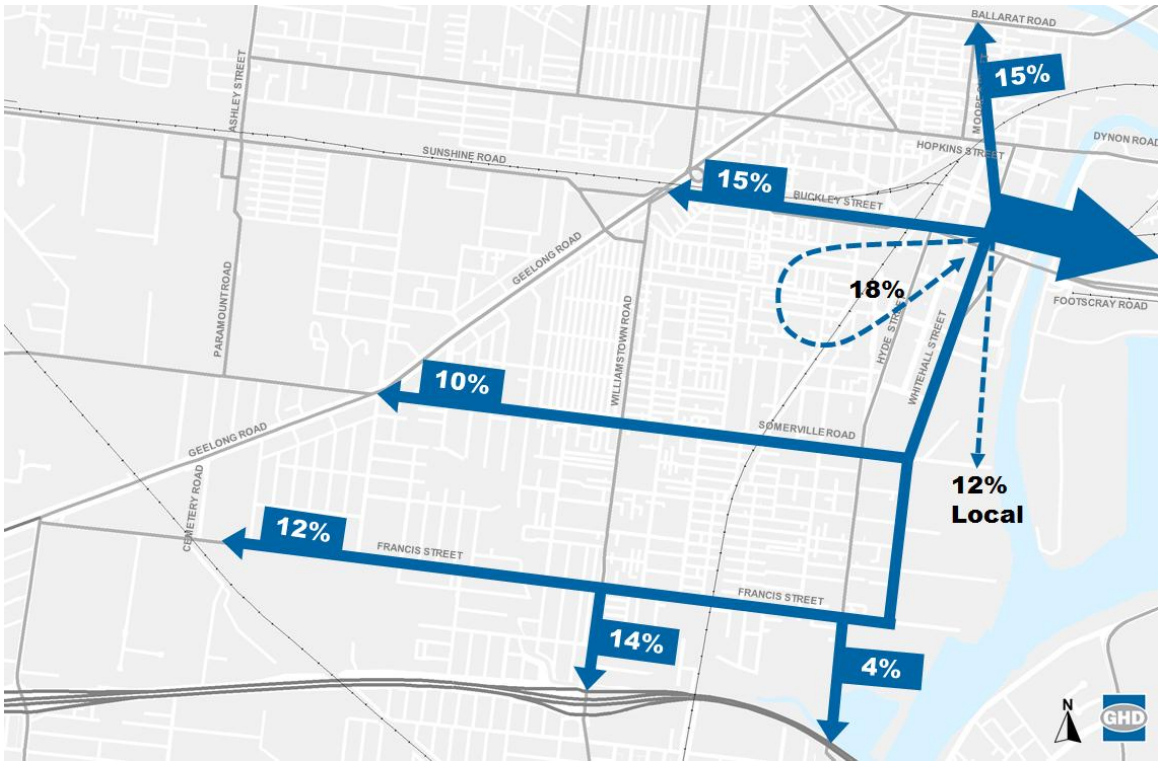
Truck impacts on the Inner West arterial roads have raised amenity issues for residents and curfews have been placed on several routes including Francis Street, Somerville Road, Hyde Street, Whitehall Street and Moore Street.

Whilst approximately half of all truck trips within the Inner West are through trips and have no purpose within the Inner West, there are a significant proportion (e.g. up to 45 per cent of all truck trips along Francis Street) that have an origin or destination directly west of Geelong Road. For these trucks, routes via Francis Street, Somerville Road, Buckley Street or Moore Street represent the shortest and most direct route to the Port of Melbourne. Existing truck volumes are presented in Figure 17 below.

Figure 17 Existing truck volumes in the Inner West (over 24 hours)

There are approximately 10,000 to 12,000 trucks per day that cross the Maribyrnong River at either Footscray Road or Dynon Road (two-way). Figure 18 presents the distribution of routes that these trucks choose to use across the Inner West arterial roads.

Figure 18 Existing Distribution of trucks crossing the Maribyrnong River



2.5.2 Specific Precinct Outlooks

Dynon Precinct

While the Port of Melbourne is a key focus for traffic movements, the Dynon Precinct (north of Footscray road between the Maribyrnong River and Dudley Street and incorporating areas north of Dynon Road) include rail facilities and significant truck movements. This precinct includes two major rail terminals for interstate and regional trains, rail maintenance, storage and support services including maintenance trucks for the metropolitan rail network.

The rail terminals operate in a different market from the Port and move in excess of 500,000 interstate containers each year with possible growth in future years. Interstate rail containers are often larger than ISO import /export containers and extend up to approximately 53 feet (16.15 metres) with gross mass up to 34 tonnes compared to port related containers at 30.5 tonnes. The major South Dynon terminal also distributes steel products from trains to local business and the Port for export.

In addition, this precinct includes logistics industry depots to the west of the precinct (staging road trips for port and rail traffic), provides heavy loads for rail maintenance (rail wheels and bogies) and generates both employment and maintenance traffic in the area. An area of industry north of Dynon Road operates mainly lower value repair and industry support businesses.

Some areas of this precinct are transitioning through a change of land use and future planning allows for change and redevelopment in the area:

- The market site in Footscray Road has now transferred from this site to the north of Melbourne providing the opportunity for a change in land use;
- A rail steel terminal north of Footscray Road between Dudley Street and the Moonee Ponds Creek has now closed and this area coupled with other rail land will be redeveloped under the E-Gate project. This area will be accessed via Footscray Road from a mixed use development of residential and commercial (e.g. office based functions) over the next 2-5 years;
- most of the rail based facilities are planned to remain in the precinct with key corridor access to the city and associated trains storage, maintenance and fuelling facilities in the precinct; and
- The future of the rail terminals in the area remains subject to further planning assessment, however there are options for relocation of these major traffic generators from the precinct in the future. These changes would be subject to the development of an alternative site to the west of Melbourne (Western Intermodal Freight Terminal – WIFT).

The Dynon Precinct remains an option for major transport corridor access routes to support the future needs of a growing city and the Port area.

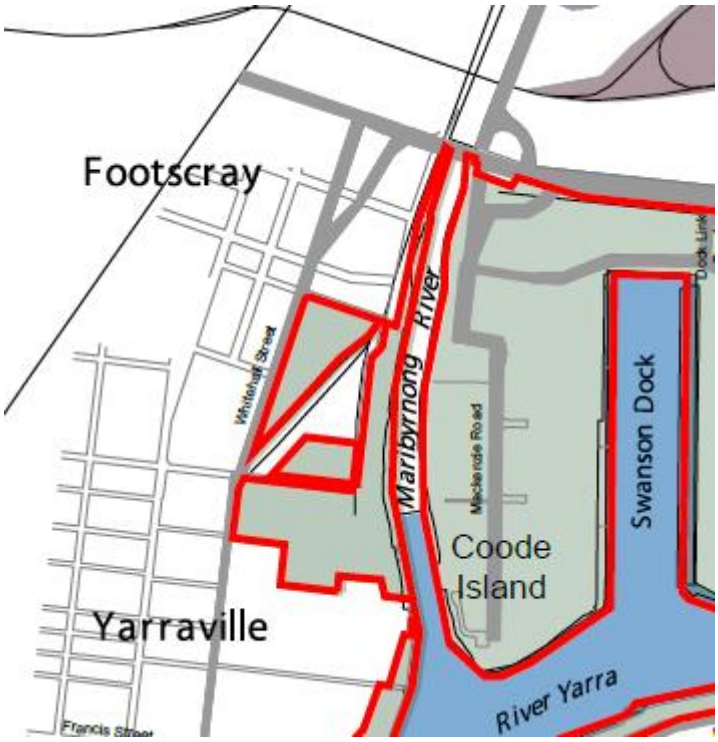
Whitehall Street and Hyde Street Light Industry

A large proportion of the light industrial land uses between Hyde Street and the Maribyrnong River in the Footscray / Yarraville area are Port related businesses, as shown in red in Figure 19. The Port of Melbourne has significant land holdings in the area, which are leased to freight and logistics businesses on long-term leases.

Land uses include seafood related businesses, an empty container park, sugar refining and plasterboard manufacturing, with associated inputs from the Port and distribution links around Melbourne for finished products.

As the majority of the land west of the Maribyrnong River is owned by the Port of Melbourne, it is expected that there will be no significant changes to land use zoning within this area in the coming years.

Figure 19 Whitehall Street and Hyde Street light industry

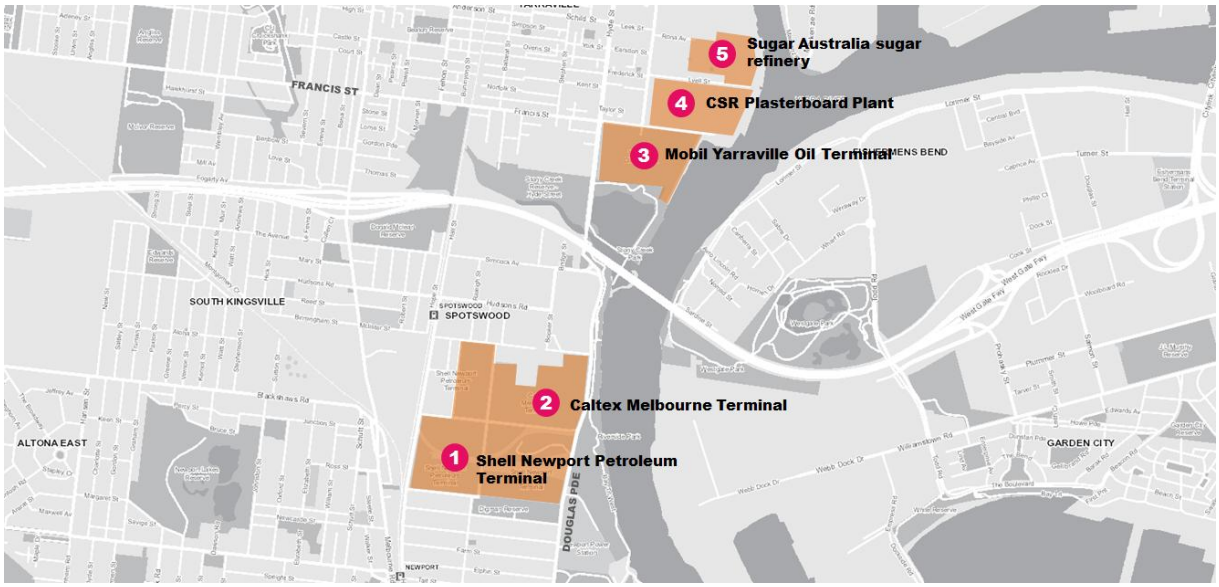


Yarraville Precinct

The Port of Melbourne, Holden Dock, located on the western bank of the Maribyrnong River south of Francis Street is a bulk liquid import and export terminal. This dock provides ship to shore transfer of bulk liquids through a series of pipelines to the Mobil/Shell and Caltex fuel storage facilities on Francis Street and Hyde Street respectively and other facilities in Altona, and Somerton dependent on pipeline connections.

The Port of Melbourne Berths also feed products for plasterboard manufacturing and sugar refining with associated finished product freight movements from the plants. An overview of the Yarraville Precinct is shown in Figure 20.

Figure 20 Yarraville Precinct overview



The Mobil/Shell and Caltex fuel storage depots generate a significant amount of fuel tanker traffic which distribute fuels across Melbourne. Traffic counts in the area indicate over 1400 movements in the Francis Street area.[8] These vehicles generally utilise access along Hyde Street and Francis Street to Williamstown Road for access to major freeways and arterials for their distribution task.

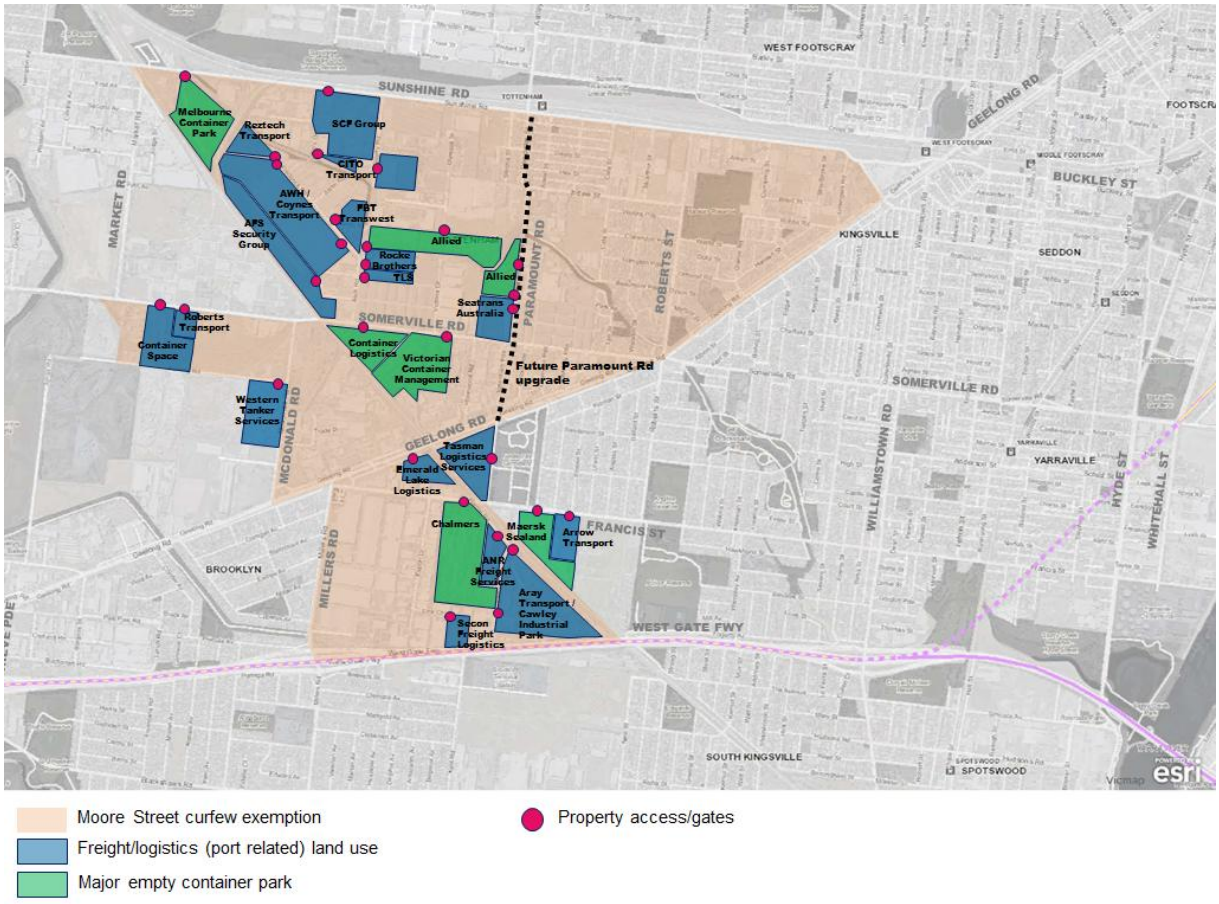
The increasing volume of petroleum products imported through the Yarraville precinct is expected to increase the volume of tankers travelling along the Inner West road network. These tankers are currently exempted from night curfews on Francis Street.

[8] Inner west traffic surveys 2013.

Tottenham Precinct

The Tottenham Precinct is a longstanding industrial area in the Inner West approximately 12 km west of the CBD, as shown in Figure 21. The Tottenham Precinct is fundamental to the economy of the western region of Melbourne by providing employment and business opportunities.

Figure 21 Freight industry in Tottenham Precinct



The Tottenham Precinct's proximity to the Port of Melbourne results in the industrial node playing a significant role in supporting the economy of metropolitan Melbourne and has led to a proliferation of transport related industries, such as empty container parks, storage and distribution centres. Other industry includes manufacturing, light industry and retail. Additionally, the proximity to the inner city also results on pressure from surrounding residential areas and increasing land prices.

Dissected by a rail corridor, as well as major roads, the Tottenham Precinct is separated into a number of zones. As a result, each zone has a varying level of accessibility to the West Gate Freeway and subsequently different preferred routes to the Port.

2.6 Recent Transport Studies

Melbourne's Inner West has been the focus of several major transport and land use projects over recent years (see list below).

It is acknowledged that whilst each of these studies and projects have had different objectives and findings, they have each in some way helped to establish a clear understanding of the context affecting the movement of trucks and residential amenity in Melbourne's Inner West.

Some of these projects have been delivered, some have been committed for delivery and others, whilst neither delivered nor committed, have undertaken baseline investigations that are of relevance to the Inner West.

The recent studies and projects that may influence the movement of freight within the Inner West include:

- 2015 – Western Distributor (Transurban)
- 2015 – West Gate Distributor (VicRoads)
- 2015 – Port of Melbourne Transaction (Department of Treasury & Finance – Port Transaction Unit)
- 2014 – East West Link – Western Section (Moving Victoria - Roads Office)
- 2014 – Western Interstate Freight Terminal (Department of Economic Development, Jobs, Transport and Resources)
- 2014 – Inner West Truck Surveys (VicRoads)
- 2013 – Port Truck Origin-Destination Surveys (Port of Melbourne Corporation)
- 2012 – Metropolitan Intermodal System (Department of Economic Development, Jobs, Transport and Resources)
- 2010 – WestLink (Linking Melbourne Authority)
- 2009 – Truck Action Plan (VicRoads)
- 2008 - East West Link Needs Assessment (Eddington)

Further detail of the above studies is provided in Appendix A.

3. Western Distributor project

3.1 Overview

Under the State Government's market-led proposal framework, Transurban, the operator of CityLink, has proposed the Western Distributor project. The new tolled link is proposed to connect the West Gate Freeway to the Port of Melbourne, CityLink and the Central Business District.

In response to Transurban's proposal, the State Government has developed a State Preferred Concept for the Western Distributor project. This concept is the design which the Transurban proposal can be benchmarked against.

Key features of the State Government business case concept are illustrated in Table 3 below. An overview of the State Government business case concept is presented in Figure 22 below.

The business case was undertaken to inform government of the merit of investment in the Project. The scope of the Project presented in this report should not be considered to be the finalised scope for the Project. This scope was developed in order to have a reasonable basis on which to develop a range of assessments as part of the typical business case development process. This includes cost estimates, economic assessments and traffic impacts to name but a few.

Should this project proceed past the business case stage, the State will undertake a more exhaustive consultation and engagement process on all aspects of the project scope to ensure that all appropriate and relevant views have been considered before refining any scope through a detailed, inclusive and transparent planning approval phase.

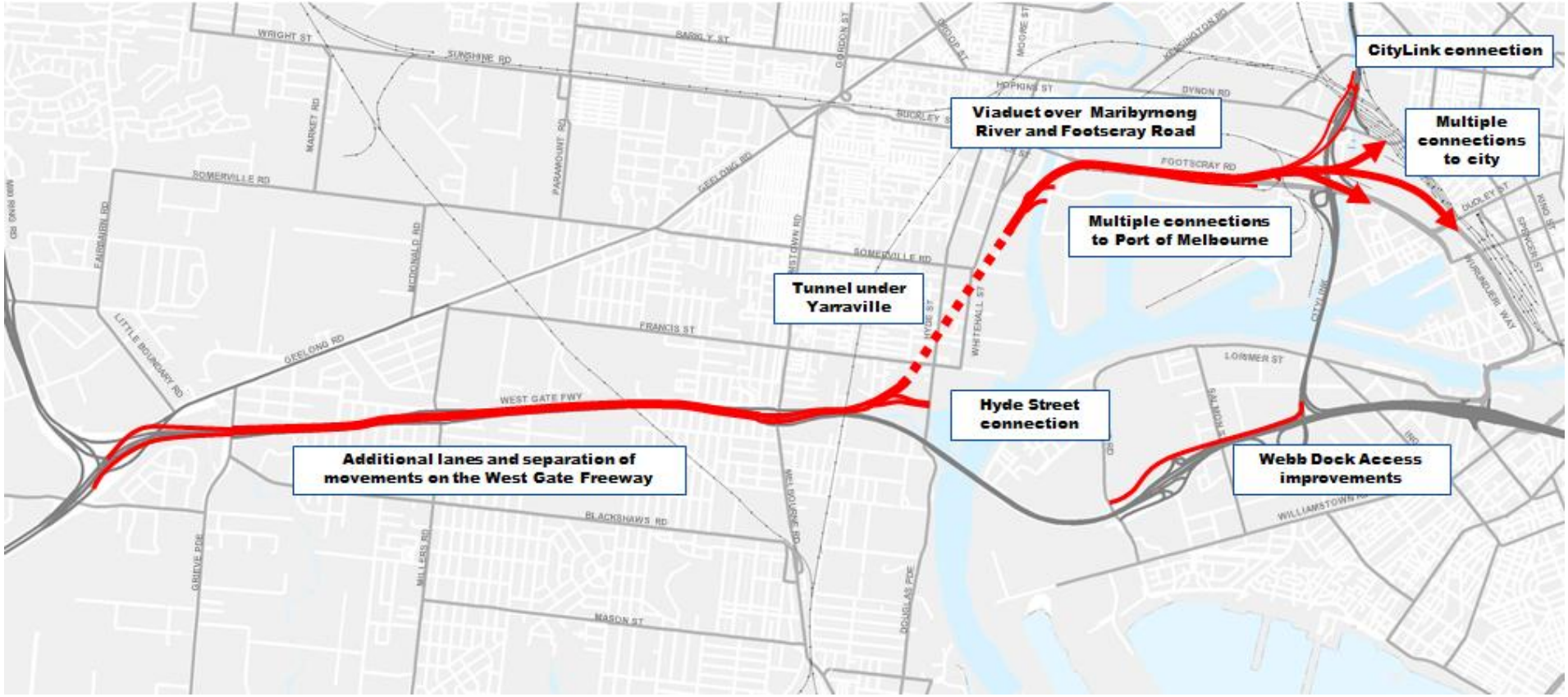
Table 3 Key project features

Business Case Concept Component	Description
West Gate Freeway - Widening	• Widening, associated pavement rehabilitation and carriageway separation of the West Gate Freeway in both directions to provide overall capacity of 6 lanes each direction (additional 2 lanes each way) between Williamstown Road and M80 configured as 3 lanes on each of the separated carriageways. • Separated carriageways with braided connections with the following features: – Eastbound – The outer carriageway destined for the Western Distributor and inner carriageway destined for the West Gate Bridge with grade separated connections at each end as well a flyover connection from the outer to inner carriageway near the standard gauge freight railway overpass (west of Williamstown Road). Arterial road connections provided along the outer carriageway. – Westbound – The outer carriageway destined for M80 and the central carriageway destined for Princes Freeway West grade separated connections to both carriageways from the Western Distributor and the West Gate Bridge. Williamstown and Millers Road access via the outer carriageway and Grieve Parade access from the central carriageway via a braided flyover of the M80 carriageway. • Strengthening of bridges along the West Gate Freeway to 75% SM1600 to accommodate High Productivity Freight Vehicles (HPFV) at higher mass limits • Separation of carriageways via solid safety barrier, provision of emergency lanes in the central carriageways and stopping bays along the outer carriageways • Posted speed of 100km/h from M80 to west of Williamstown Road • Replacement of two existing pedestrian bridges spanning over the West Gate Freeway in the vicinity of Wembley Avenue and Rosala Avenue • Upgrade noise walls along the West Gate Freeway with concrete and Perspex noise walls

Business Case Concept Component	Description
Western Distributor – Yarraville alignment (including tunnel)	• Connections between the West Gate Freeway and the tunnel portals and rebuilding of the Williamstown Road interchange bridges • New west-facing ramps for vehicles to access Hyde Street from the elevated connection • Two 15.5m diameter bored, 1.6km tunnels ultimately catering for three traffic lanes in both directions, operating only as two lanes with shoulders initially, using a single tunnel boring machine • Southern portal on the north side of the West gate Freeway near Hyde Street • Northern portal east of Whitehall Street, north of Somerville Road, west of the Maribyrnong River
Western Distributor – Elevated road and port access	• Single span bridge across the Maribyrnong River • Direct access to the Port of Melbourne at Mackenzie Road (to/from West Swanson Dock) • Viaducts in both directions above Footscray Road • Eastbound viaduct connection to Appleton Dock Road at the existing intersection with Footscray Road (to access East Swanson Dock, Victoria Dock, Appleton Dock) with a return westbound viaduct connection from Footscray Road • Grade separated shared user facility at Appleton Dock Road, Footscray Road and Mackenzie Road intersections
Webb Dock Access	• Single lane widening of Cook Street (Eastbound) from Todd Road to the West Gate Freeway ramp terminal intersection. • Dedicated new connection and an upgrade to the West Gate Freeway-to-CityLink northbound ramp(Ramp M) including widening for ramp metering, realignment and regrading along the ramp and signalisation of the Cook Street/Salmon Street intersection.
Western Distributor – Eastern interchange	• Inbound and Outbound: Connections to CityLink via modified Dynon Road ramps. • Access via ramps onto Footscray Road with additional connections to Dynon Road and Wurundjeri Way. Final resolution of scope will include consultation with Melbourne City Council, other stakeholder and the community.

Business Case Concept Component	Description
Freeway Management System	• Ramp metering upgrades (increased storage provisions) and new installations including the West Gate Freeway, Western Distributor and Princes Freeway West, including metering of the West Gate Freeway/CityLink connections (East-to-North and North-to-West) • Installation of LUMS and supporting ITS along the West Gate Freeway and Western Distributor, including adjacent sections of the Princes Freeway West and M80.

Figure 22 - Western Distributor – State Business Case Concept



4. Assessment of Freight Network Impacts

The proposed Project aims to provide a series of benefits to the freight industry with aligned improvements to local residential street amenity. Freight movements have a strong relationship to industrial precincts where storage, freight and logistics facilities are often located, providing services to the local manufacturing industry and distribution of goods to the broad population. Links to the Port of Melbourne are also critical to supplying industry and distribution needs, as well as for regional exporters.

The provision of a direct link from the West Gate Freeway to the Port of Melbourne (via the Western Distributor tunnel) would diminish the need for trucks to access local streets from Williamstown Road to and from the Port. This would reduce through traffic in residential areas on Somerville Road and Francis Street to local traffic with improved amenity for residents.

Freight traffic travelling from the outer industrial/freight precincts in Altona, Laverton, Airport West, Somerton and regional Victoria travelling along the West Gate Freeway would continue on to the Western Distributor tunnel, with direct access to the Port, improved travel times and increased reliability.

Freight traffic travelling to the inner north of Melbourne through this area, could choose between options of the Western Distributor or CityLink to access connecting arterials.

Freight traffic from inner industrial/freight precincts of Tottenham, Footscray and Yarraville would also benefit, although potentially not to the same extent, with further detailed assessment of local zones within these precincts required to assess more specific impacts and outcomes of the project. Further detail on these areas is included in the sections below.

4.1 Impact on Freight Industry Trends

The Western Distributor project provides improved access and redundancy for logistics operators in the west of Melbourne including:

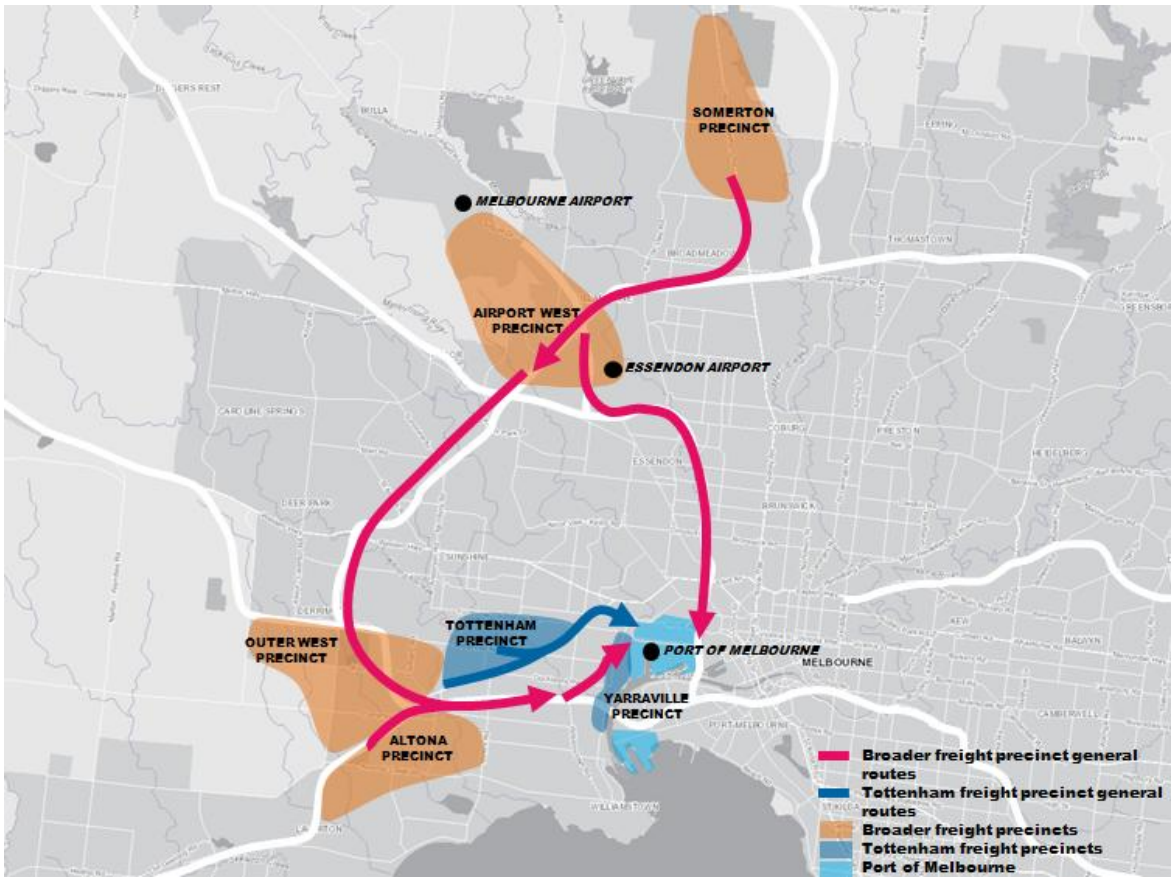
- The outer west industrial precinct;
- The Altona industrial precinct;
- Regional traffic from the west; and
- Northern industrial precincts at Airport West and Somerton using the West Gate Freeway.

Figure 23 below indicates the industrial/freight precincts which are relevant to the western road access to the Port Precincts and inner Melbourne. Freight travelling from all of these locations will all benefit from:

- Improved direct access to the Port;
- HPFV (mass) access to the Port Precinct;
- Increased capacity on the West Gate Freeway and reduced delays/congestion resulting from this capacity increase; and
- Faster and more reliable travel times to the Port avoiding the need to travel through local streets and controlled intersections.

Dependent on roadway tolls and total travel times, freight from the northern precincts of Airport west and Somerton may choose between the M80/West Gate Freeway and Tullamarine Freeway/CityLink routes in the future.

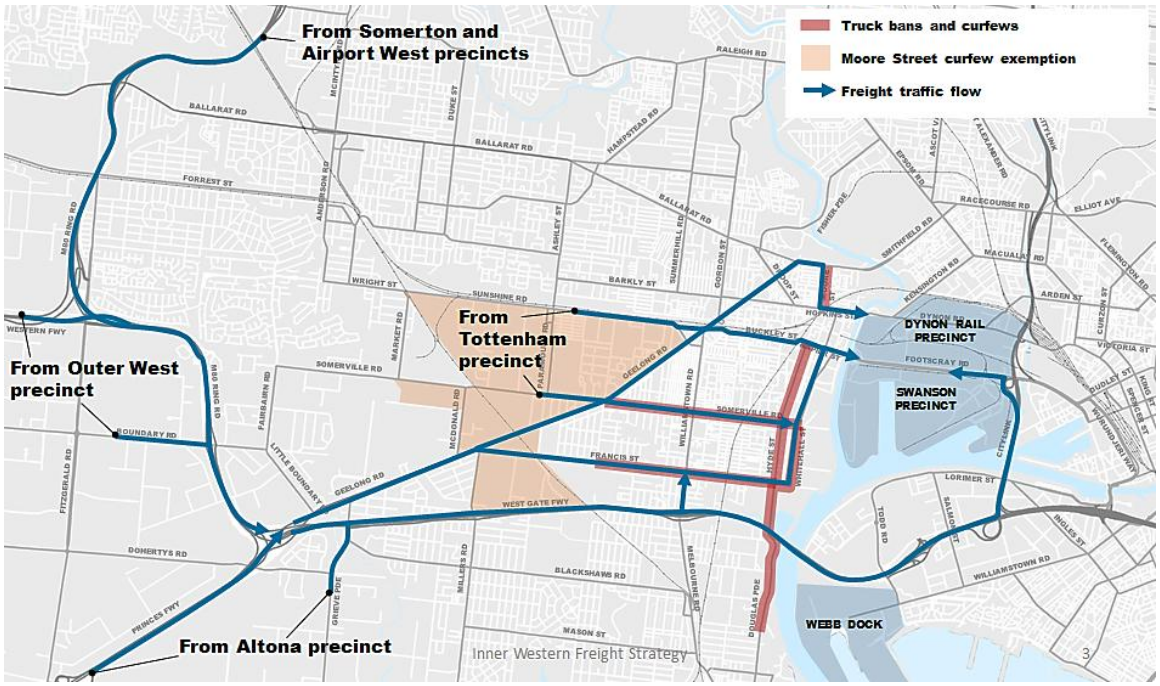
Figure 23 Industrial/freight precincts relevant to western road corridor



In Figure 23 above, the outer precincts (coloured brown) typically utilise the West Gate Freeway as a main arterial corridor. Based on the current Project scope and known traffic conditions/surveys, the implementation of the Western Distributor project will potentially improve travel times to/from the Port Precinct to destinations along the West Gate Freeway and to areas to the west of the city, thus resulting in greater use and benefits for industrial/freight precincts to the outer west and the north.

The inner precincts of Tottenham and Yarraville link to the Port of Melbourne and distribution locations through the local arterial roads of Francis Street, Somerville Road, Buckley Street and More Street. As a result, the inner precincts may not be to gain the same project benefits as outer precincts, with access to the Western Distributor route potentially a comparative or longer route than their current direct options to the Port and key destinations.

Figure 24 General freight flows to/from Port



Operators in the southern areas of the Tottenham Precinct will compare the benefits of HPFV and direct access via the Western Distributor (including a potential toll) with direct access through local streets (with no toll). Operators in the northern areas of Tottenham with an additional travel distance are unlikely to see the benefits of backtracking to the freeway compared to the direct route.

Yarraville operators transporting materials to the west will benefit from direct connection to the West Gate Freeway via new Hyde Street ramps, however, journeys to the east will need to take the existing route via Francis Street or divert to a Footscray Road alternative.

In many cases freight operators within these precincts will continue to seek the same direct routes through local streets and residential areas as these provide the lowest cost operations for their businesses.

A key reason for the location of empty container parks in these areas is the proximity to the Port of Melbourne with a short direct journey to the port for empty container returns to ship for export. Likewise fuel depots in the Yarraville area are located near Holden Dock fuel imports for pipeline connections to storage areas, as a base for metropolitan and regional distribution.

Further examination of impacts for these two precincts are included below.

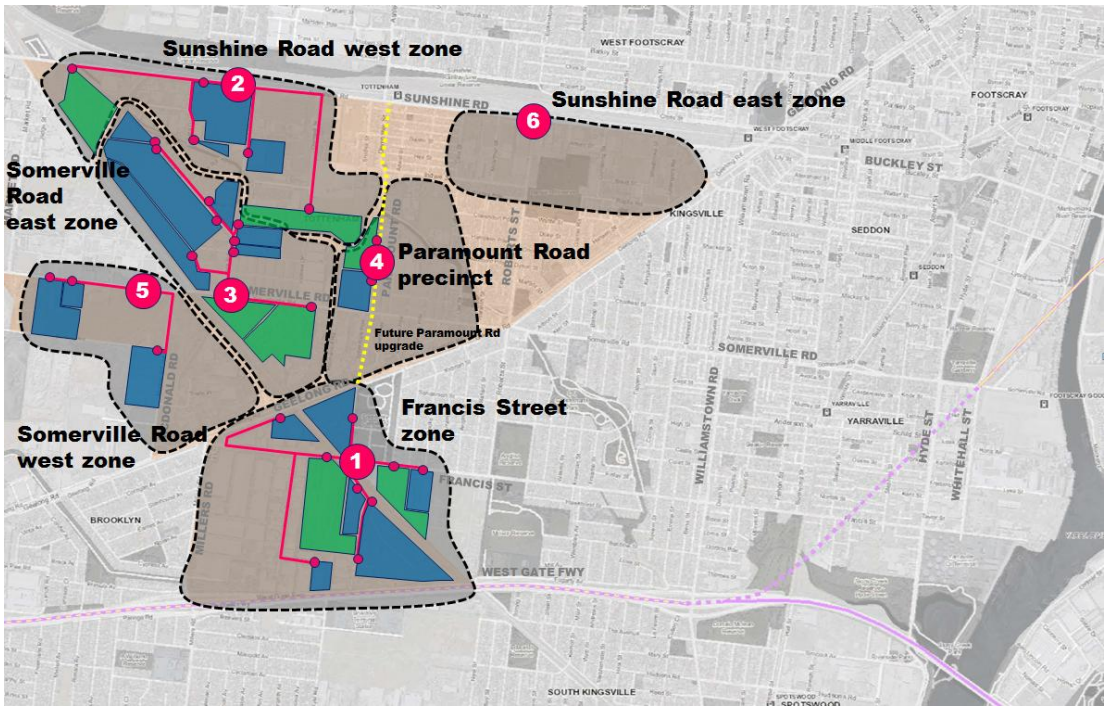
4.1.1 Tottenham Precinct

Assessment of the Tottenham Precinct will identify industrial areas, by individual “zone” (Figure 25), exploring their comparative travel distance and indicative trip times to establish likely travel patterns based on cost implications to the operator.

The industrial areas of the Tottenham Precinct are located north of the West Gate Freeway alongside Geelong Road and separated by the Tottenham to Newport rail line which has level crossings at Francis Street and Somerville Road.

The rail line and major road connections in the precinct impact the areas of access to the road network with effective zones of access spread across the precinct. The zones indicated in Figure 25 below indicates how internal roads in the precinct direct traffic access to the road network.

Figure 25 Tottenham Precinct Access Zones



The road access connections indicated in red highlight, potential activity zones within the Tottenham Precinct and names and are aligned to their major access route to the road network. The operators within each of these zones may choose different alternative routes to the Port/Dynon Precinct as a result of their individual needs and locations.

Each of these zones has been assessed on the basis of travel distances and routes to the port and these are indicated in Figure 26 to Figure 31.

Figure 26 Tottenham Industrial Zone 1 to Port

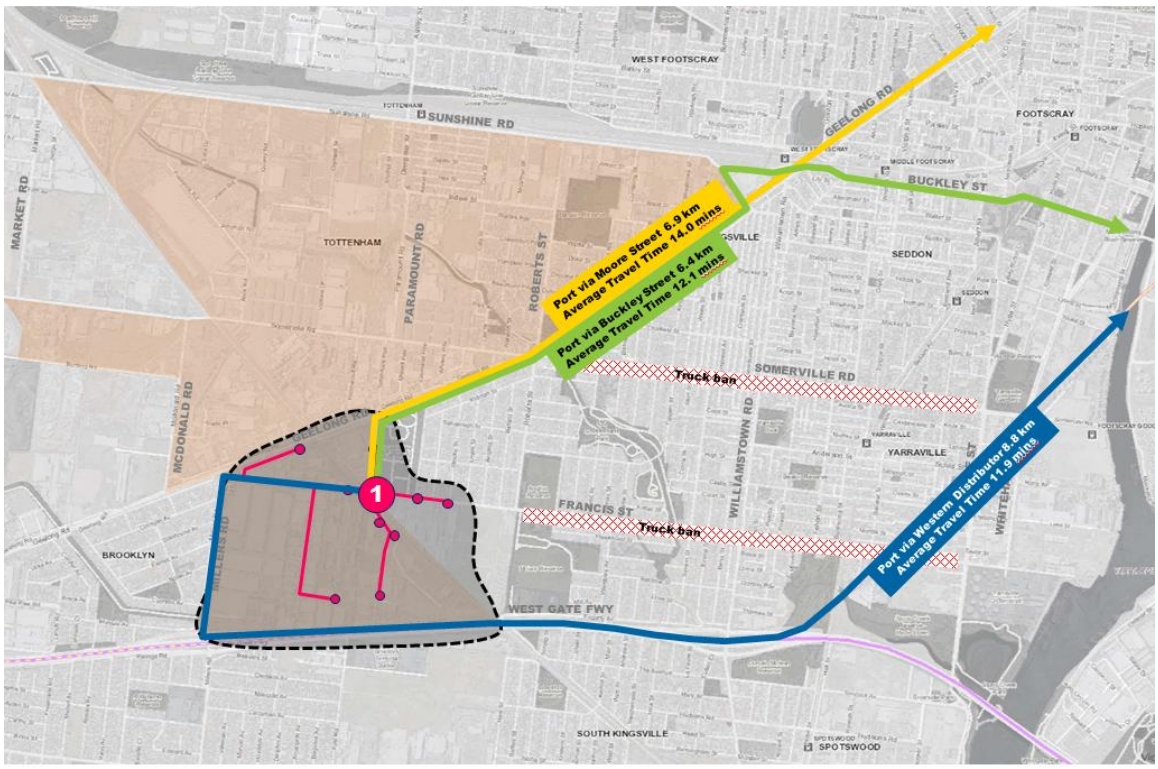


Figure 27 Tottenham Industrial Zone 2 to Port

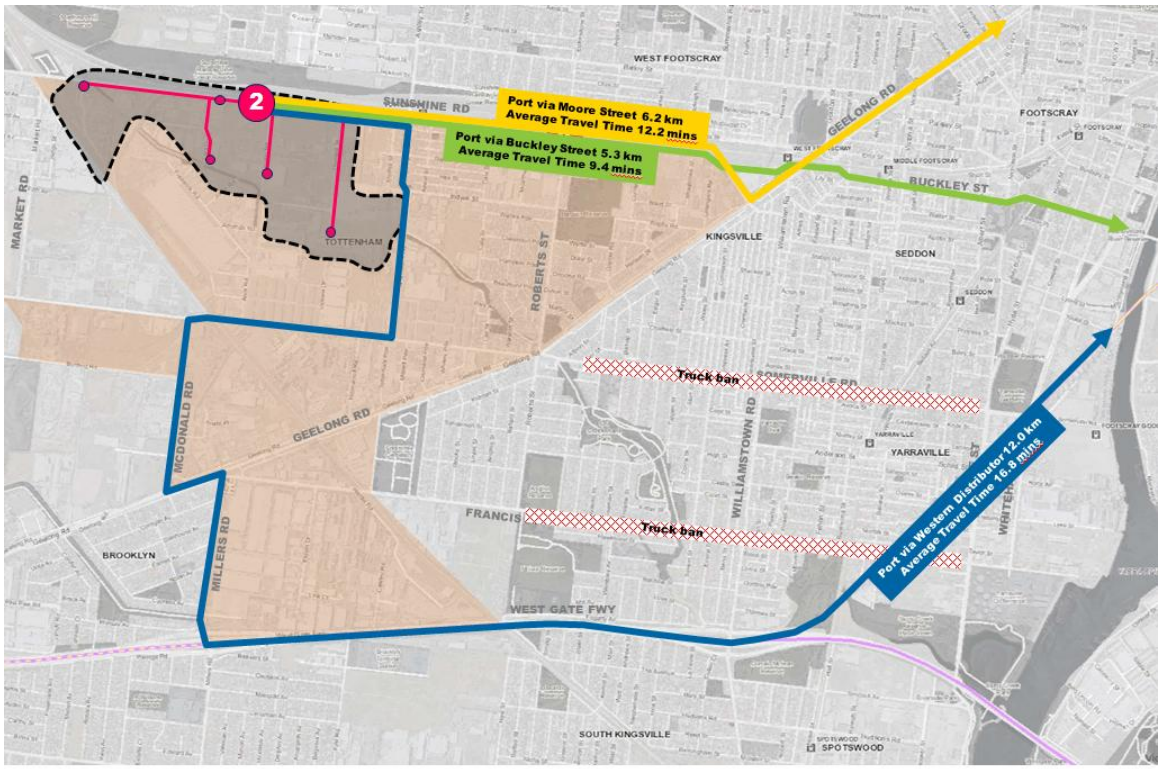


Figure 28 Tottenham Industrial Zone 3 to Port

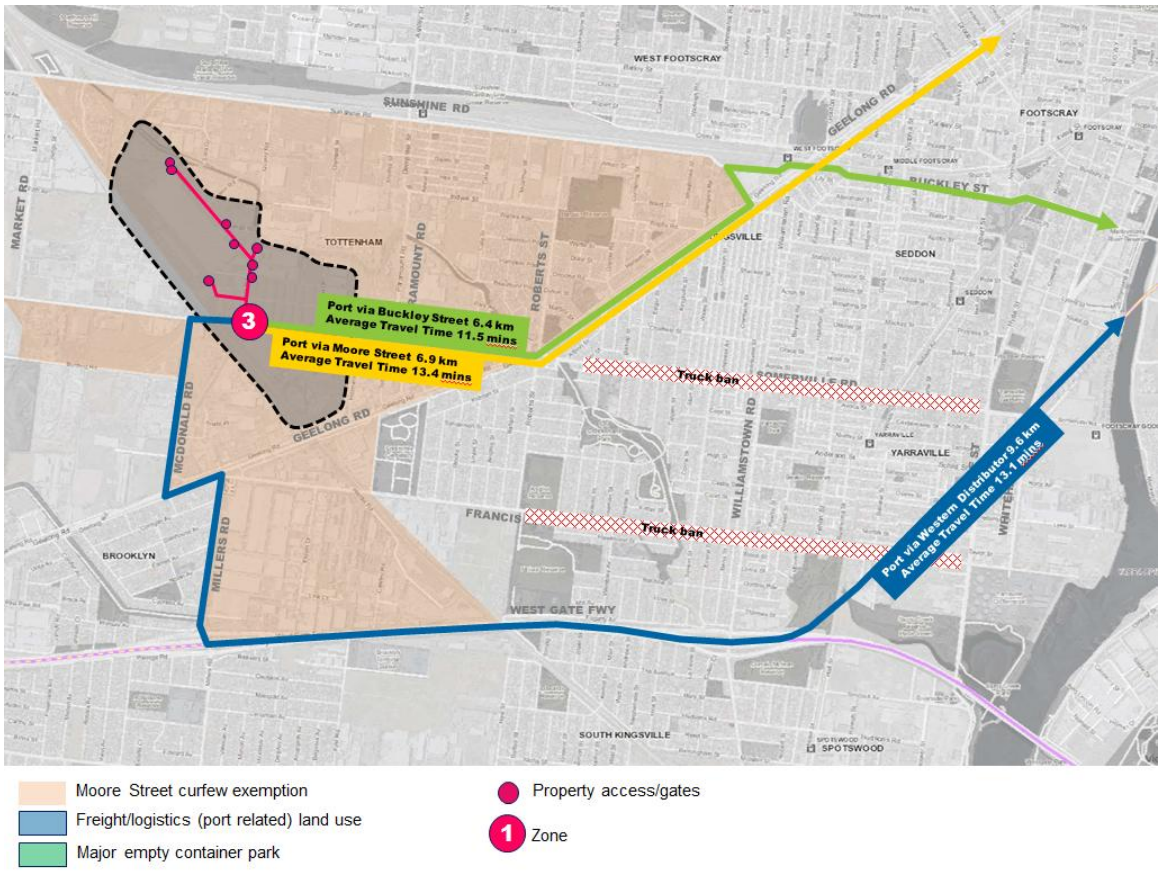


Figure 29 Tottenham Industrial Zone 4 to Port

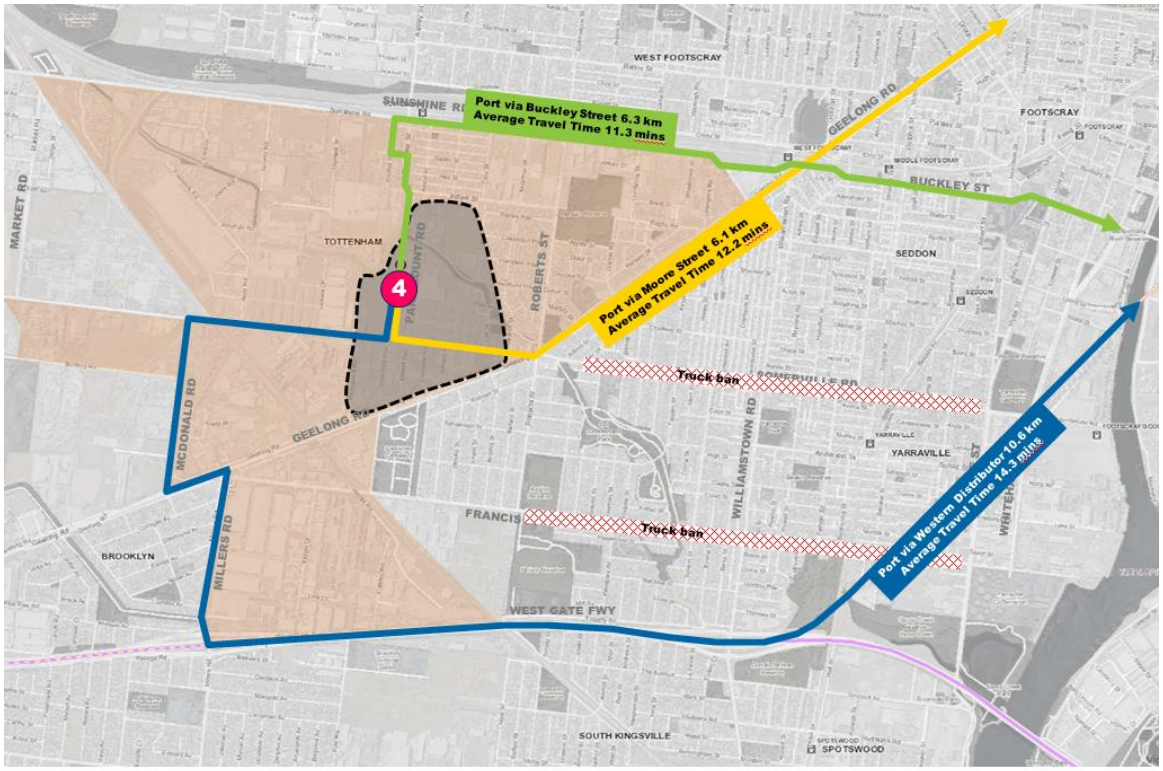


Figure 30 Tottenham Industrial Zone 5 to Port

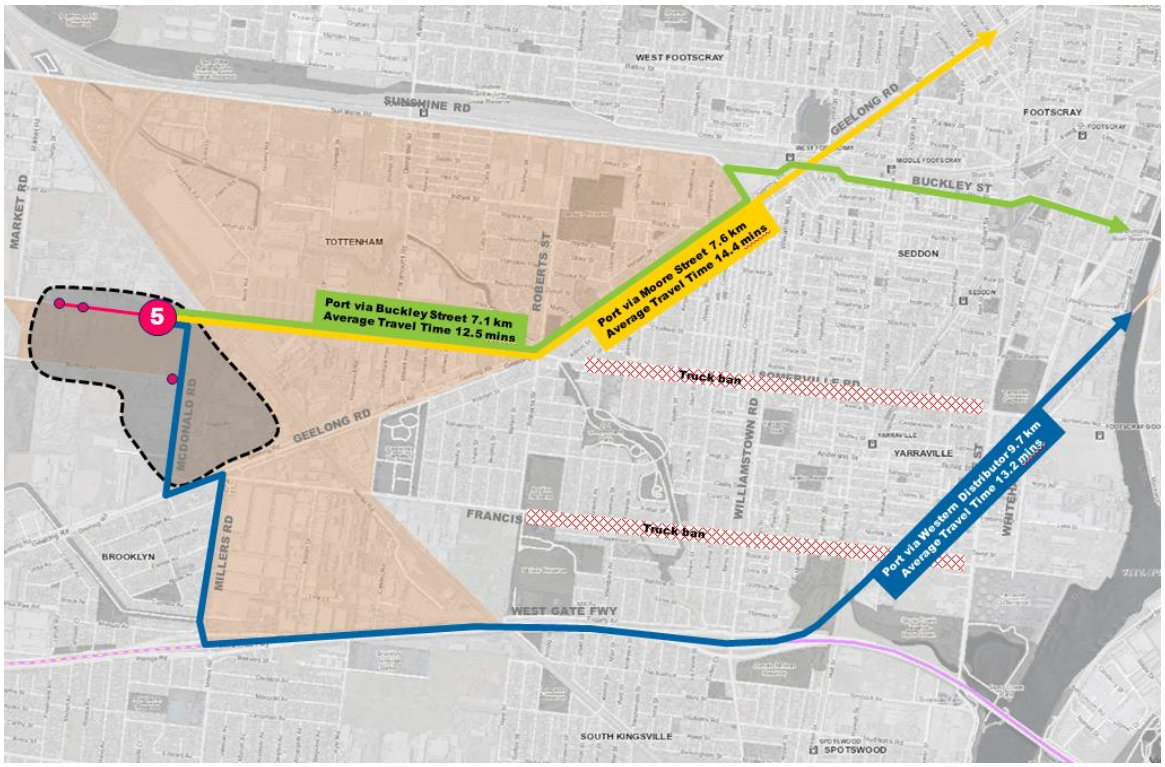


Figure 31 Tottenham Industrial Zone 6 to Port

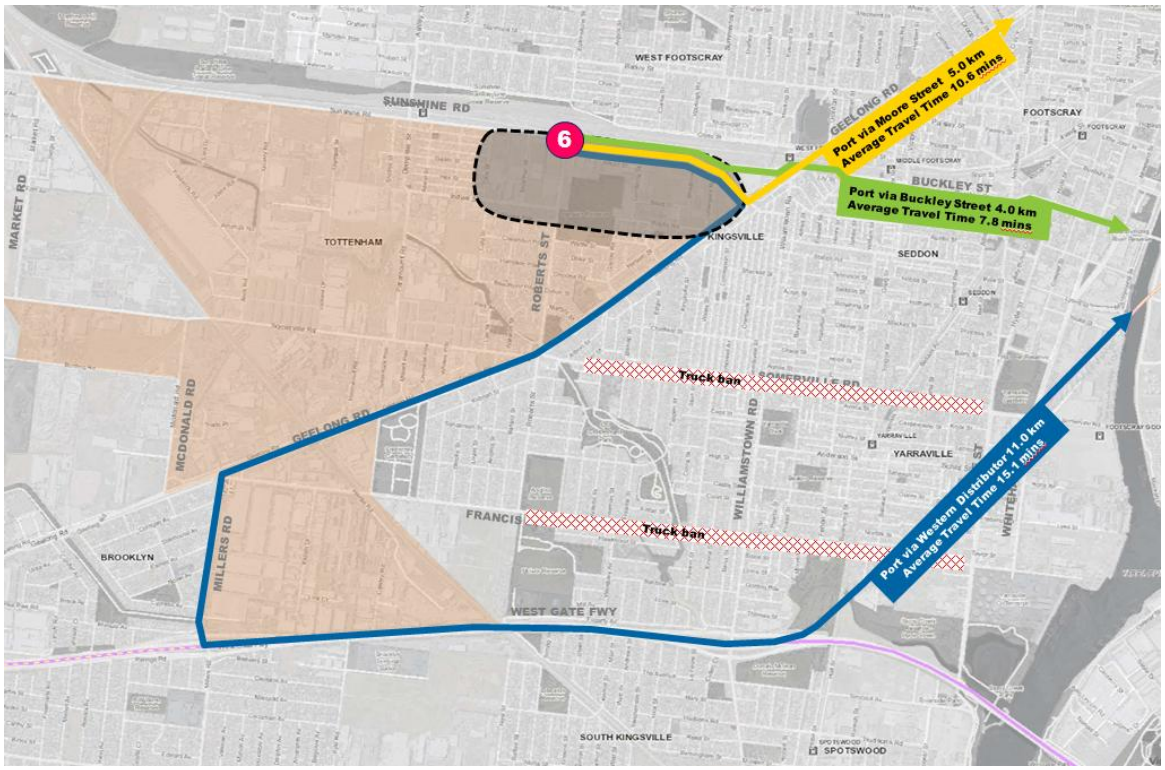


Table 4 describes the access options for zones within the Tottenham Precinct, with green highlighting the fastest/shortest option and orange the second fastest/shortest option.

The indicative findings suggest that travel to the Port via Western Distributor is unlikely to be considered the most efficient route from most zones in the Tottenham Precinct, however, it is seen to be more efficient than travel via Moore Street in southern and western zones of the precinct.

Travel via Buckley Street or Moore Street routes are the most efficient route to the Port from the Tottenham Precinct and are not impacted by a potential toll. However, Buckley Street is height restricted for 9'6" containers and high volume HPFV's.

The imposing of curfews to the existing routes would impact the preferred travel routes.

Table 4 Summary Tottenham zone access options and indicative route travel times

Zones	Port via Moore St			Port via Buckley St			Port via Western Distributor			Likely Preferred Route
	Distance	AM Peak Time	Ave Non-Peak Time	Distance	AM Peak Time	Ave Non-Peak Time	Distance	AM Peak Time	Ave Non-Peak Time	
Zone 1 – Francis St	7 km	18 mins	13 mins	6 km	16 mins	11 mins	9 km	17 mins	10 mins	Similar times - Buckley avoids tolls but height restricted
Zone 2 – Sunshine Rd West	6 km	17 mins	11 mins	5 km	14 mins	8 mins	12 km	22 mins	15 mins	Buckley or Moore avoids toll and quicker. Buckley height restricted
Zone 3 – Somerville Rd East	7 km	18 mins	12 mins	6 km	16 mins	10 mins	10 km	18 mins	12 mins	Buckley avoids toll but height restricted
Zone 4 – Paramount Rd	6 km	17 mins	11 mins	6 km	16 mins	10 mins	11 km	19 mins	13 mins	Buckley or Moore avoids toll and quicker. Buckley height restricted
Zone 5 – Somerville Rd West	8 km	19 mins	13 mins	7 km	17 mins	11 mins	10 km	18 mins	12 mins	Similar times - Buckley avoids tolls but height restricted
Zone 6 – Sunshine Rd East	5 km	15 mins	9 mins	4 km	12 mins	7 mins	11 km	20 mins	14 mins	Buckley or Moore avoids toll and quicker. Buckley height restricted

Note: Travel times presented here are indicative only and are not based on observed travel time surveys.

4.1.2 Yarraville Precinct

The Yarraville Precinct is also an area where further examination is required in view of potential increases in the fuel storage requirements in the Francis Street /Hyde Street areas.

As with the Tottenham Precinct, assessing specific zones in the precinct will provide further information on potential travel distances and times. There is also a need to evaluate route options and impacts for fuel tankers in the Yarraville Precinct under different scenarios. While the ramps to the West Gate Freeway will provide direct access to the west avoiding potential curfews and restrictions, distribution of fuel applies across the metropolitan area and eastbound traffic will need to find a relevant route option.

Eastbound routes are likely to include Hyde Street and Footscray Road to Wurundjeri Way and City Road avoiding the restriction of placarded vehicles through the CityLink tunnels to the east. These options are illustrated in Figure 32 assessed on the basis of travel distances and routes to the Port and summarised in Table 5. Assessment of these options can provide the basis of a strategic case.

Figure 32 Yarraville access options with Western Distributor

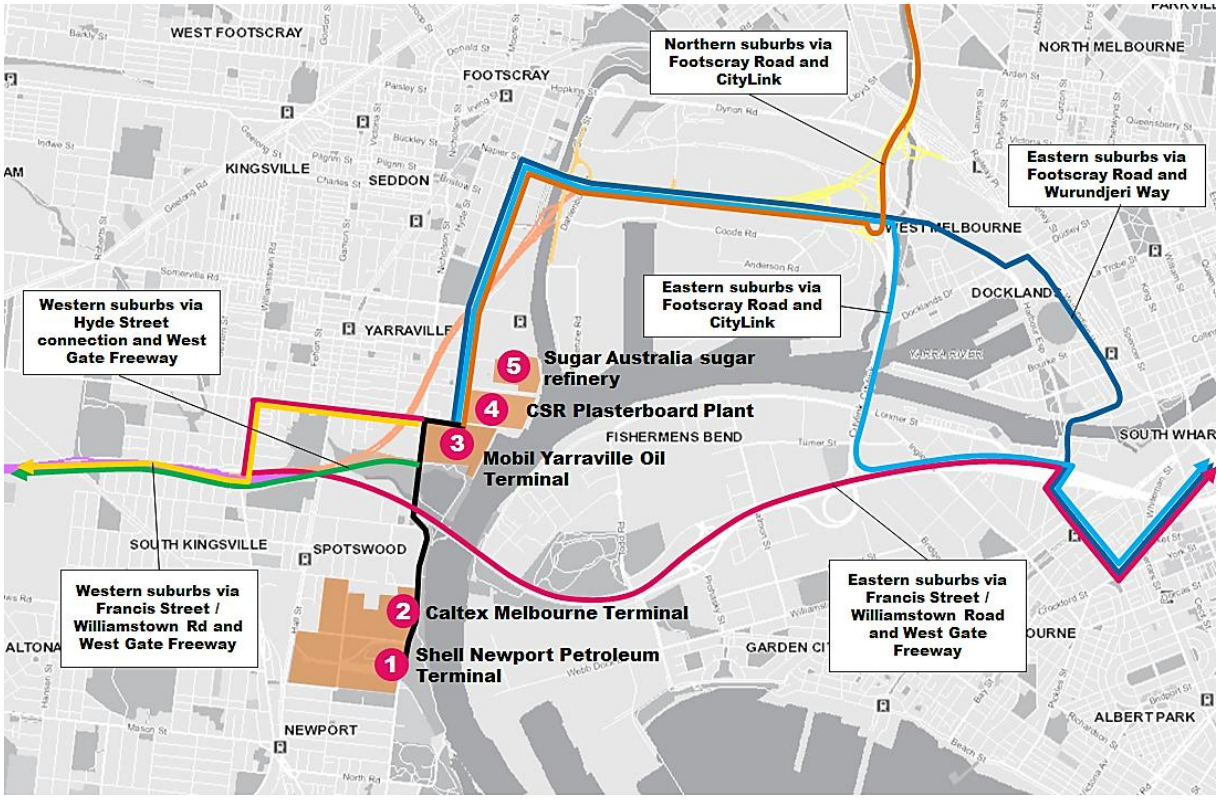


Table 5 Summary Yarraville access options and indicative route travel times

Destination	Routes	Yarraville Tanker Movements East from Precinct			Route impact
		Distance	AM Peak Time	Ave Non-Peak Time	
Montague St Exit	Francis St, Williamstown Rd & West Gate Fwy	8 km	21 mins	10 mins	Restricted with curfews implemented
	Footscray Rd & CityLink	8 km	22 mins	12 mins	Tolls potentially push freight onto Wurundjeri Way
	Footscray Rd & Wurundjeri Way	8 km	22 mins	13 mins	No tolls. Similar travel times
To Footscray Rd/CityLink	Francis St, Williamstown Rd, West Gate Fwy & CityLink	9 km	18 mins	10 mins	Restricted with curfews implemented
	Whitehall St & Footscray Rd	5 km	14 mins	8 mins	No tolls. Shorter route

While the existing road network (un-encumbered by curfews) provides a more direct route from these locations, it has been assumed at least existing curfews are in place. And further changes may occur in the future.

4.2 Impacts on Freight Land Use

Broadly, the Western Distributor project will have limited direct impact on existing freight-related land use in the west of Melbourne in the short term, but may provide the potential for change when network management measures are considered in the Inner West.

The Tottenham Precinct is recognised as a potential redevelopment area with its proximity to the city likely to drive an increase in land values over time, and a resultant reuse and rezoning of brownfield areas from industrial land to more commercial and residential land uses. Based on these potential directions the impacts of heavy vehicle traffic would increase and further limitations would be possible in the area.

While direct access to the Port via Inner West arterial roads is the subject of part-time curfews today, there is a potential for further constraints and changes which alter travel times and access to the Port. Changing land values in these areas will also impact business costs. Coupled with improved freeway access via an upgraded West Gate Freeway and direct access to the Port from the Western Distributor tunnel, businesses in the Tottenham areas may choose to relocate over time leading to land use changes in the area.

Potential tolling of roadways could also be a factor in these changes

4.3 Impacts on Freight Transport Network

The Western Distributor project provides a number of key benefits for the freight industry by providing more direct access to the Port of Melbourne and alternate routes across the Maribyrnong River.

Indicative changes in commercial vehicle traffic flows after implementation of the Western Distributor project are presented in Table 6. Based on project assumptions, the Western Distributor project is estimated to remove between 4,000 and 6,000 trucks a day from the West Gate Bridge, and reduce truck volumes on other key routes such as Geelong Road.

Table 6: 2031 base case vs 2031 project case change in commercial vehicles (24 hours)

Road	Modelled change in commercial vehicles (2031 project vs 2031 base)
West Gate Bridge	-4,000 to -6,000 trucks per day
West Gate Freeway (between Williamstown Road and Grieve Parade)	2,500 to 3,500 trucks per day
Geelong Road	-2,500 to -3,500 trucks per day
Western Distributor	9,000 to 11,000 trucks per day

The Project can also reduce the number of trucks utilising local arterial roads resulting in improved amenity for residents in these Inner West areas. In particular, the Western Distributor project has the potential to remove truck trips from the Inner West arterial road network which originate from (or are destined for) the West Gate Freeway/M1 corridor and have no direct purpose (initial origin or final destination) within the Inner West area. This is discussed further below.

4.3.1 Base Project – Western Distributor (no changes to curfews)

This section summarises the estimated impacts of the Western Distributor, with no new truck curfew interventions.

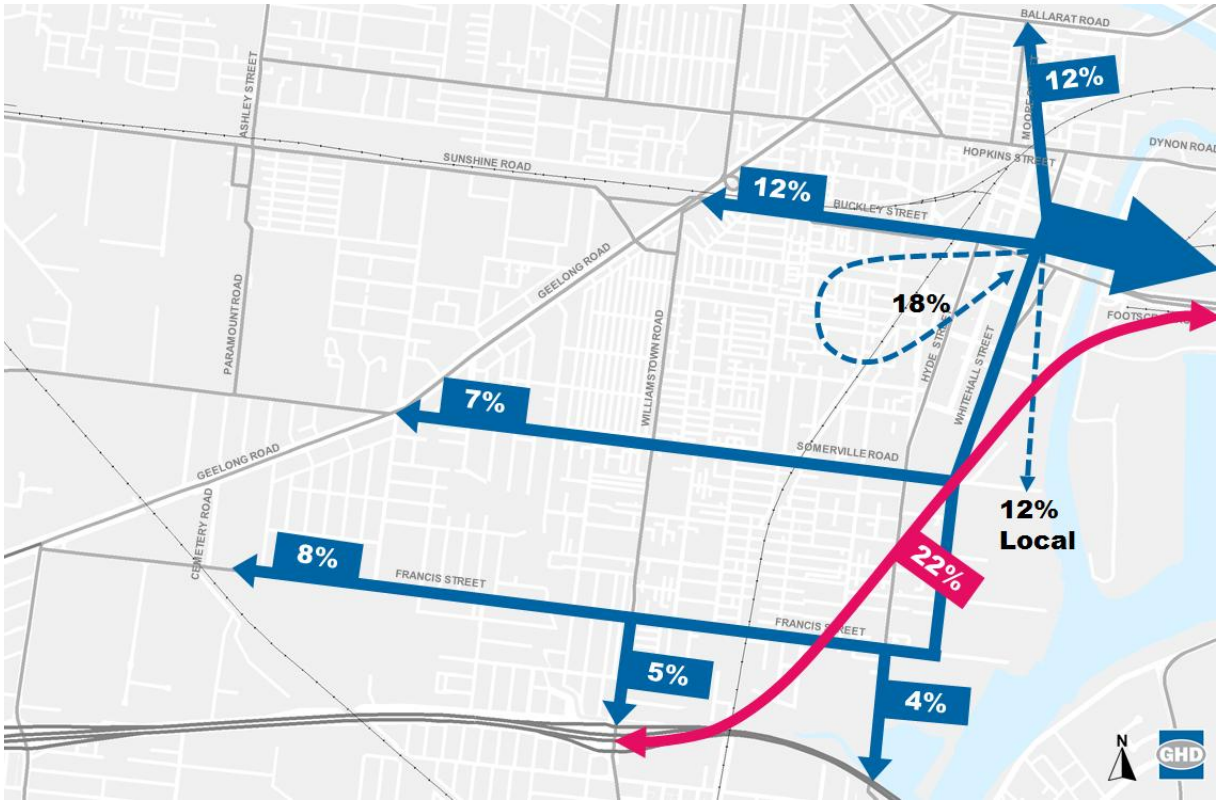
Based on the December 2013 Inner West Truck Survey, in total, of the 11,124 trucks travelling across the Maribyrnong River at Footscray Road or Dynon Road, between 2,413 (22%) to 2,754 (25%) of all trucks had no origin or destination in the Inner West, or in Tottenham, and were assumed to be on a journey towards the M1 corridor. It is noted that approximately 8 per cent of all trucks travelling across the Maribyrnong River were recorded as tanker trucks.

Based on this data and project modelling, it is assumed that the volume of trucks that could redistribute to the Western Distributor is up to 22 per cent.

Figure 33 depicts the redistribution of trucks away from the local road network and onto the Western Distributor.

For example, of the trucks that previously (i.e. without Western Distributor) crossed the Maribyrnong River, 14 per cent originated from or were destined for Williamstown Road. With the Western Distributor built, modelling indicates that this could potentially fall to as low as 5 per cent of all trucks that crossed the Maribyrnong River at Footscray Road or Dynon Road.

Figure 33 – Estimated truck redistribution from Western Distributor (with no additional curfews)



Hyde Street Ramps

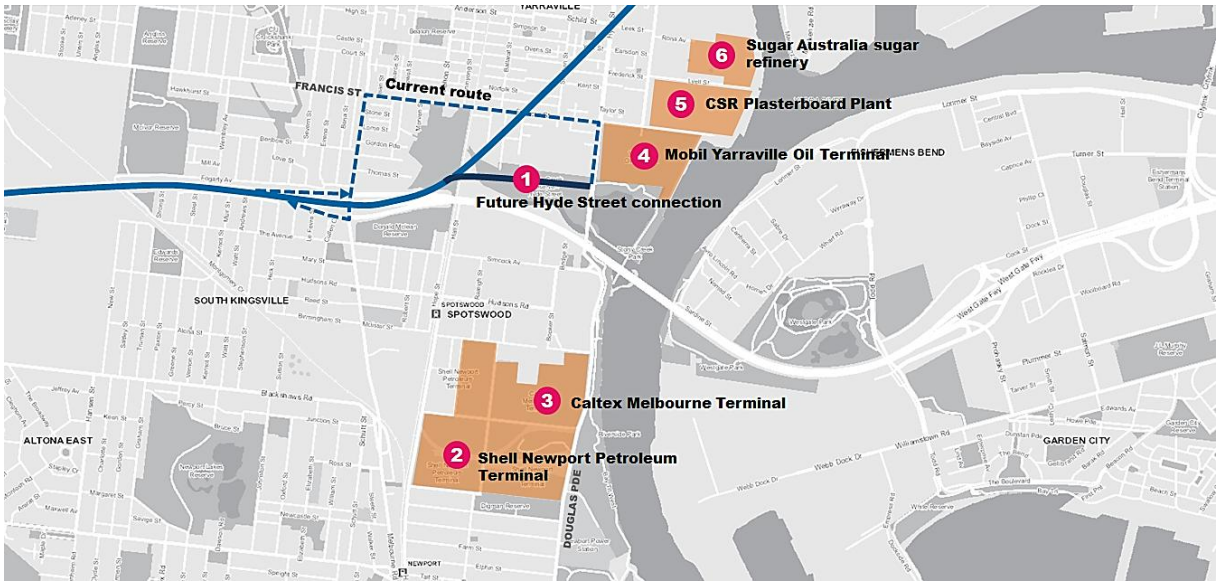
Fuel tankers from the Mobil, Caltex and Shell terminals that travel via Hyde Street, Francis Street and Douglas Parade are currently exempt from night-time truck curfews and often travel along Francis Street and Williamstown Road to access the West Gate Freeway. As placarded loads would not be permitted in the Western Distributor tunnel, under this arrangement tankers would continue to use the local road network.

The Western Distributor project will include a direct connection between the West Gate Freeway and Hyde Street, allowing over-height and placarded trucks to travel between industry along the

Maribyrnong River and the western suburbs without travelling through residential areas. These ramps would provide a direct route to the west for trucks with origins or destinations along Whitehall Street or the fuel refineries on Hyde Street.

Figure 34 presents an overview of the Hyde Street connection, showing the existing route between the fuel refineries and the west and the proposed future route using the Hyde Street ramps.

Figure 34 – Proposed Hyde Street ramps



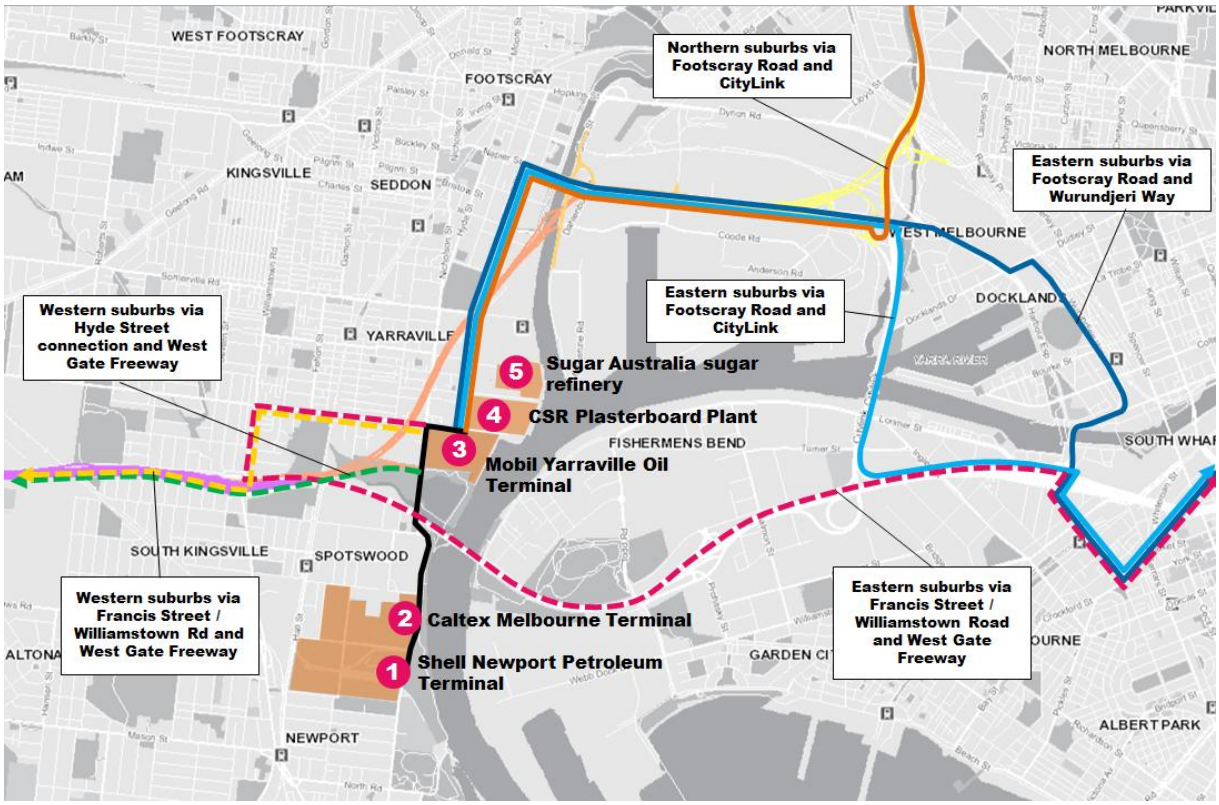
Traffic modelling undertaken by VLC for the Western Distributor indicates that the proposed Hyde Street ramps would carry between 800 and 1,200 trucks per day.

Based on the December 2013 Inner West Truck Survey, there were 1,442 trucks observed using Hyde Street south of Francis Street over a 24 hour period, of which 67 per cent were fuel tankers. Thirty per cent of the trucks observed on Hyde Street had an origin or destination at Williamstown Road south of Francis Street and are likely to have travelled along the West Gate Freeway. It is anticipated that a high proportion of these trucks are likely to use the Hyde Street ramps.

At Williamstown Road south of Francis Street, there were 4,777 trucks observed over the 24 hour period, of which 17 per cent were fuel tankers. A sizeable proportion of these tankers are also likely to use the Hyde Street ramps to travel directly between the refineries and the west.

However, as the ramps only provide connectivity to and from the west, the Hyde Street ramps would not provide an alternative route for fuel tankers travelling to/from the east or north of the city along the West Gate Freeway. These trucks would have to continue to use Francis Street and Williamstown Road to travel east, or use Footscray Road and CityLink or Wurundjeri Way to access areas to the north and east of Melbourne. Figure 35 below indicates available options.

Figure 35 Yarraville Precinct route options



4.3.2 Base Project - Inclusive of Curfews on Somerville Road and Francis Street

To achieve further reductions in truck volumes from the Inner West, additional curfews may be required. Providing full-time truck curfews on Francis Street and Somerville Road is considered to provide an equitable balance between the needs of the freight industry and the amenity of the local community.

A full time truck ban on Somerville Road and Francis Street provides additional controls which can limit truck traffic and further enhance amenity in the area. These curfews consist of:

- Full time truck bans on Somerville Road between Geelong Road and Hyde Street; and
- Full time truck bans on Francis Street between Roberts Street and Hyde Street.

Based on the results of the December 2013 Inner West Truck Survey, it is estimated that a 24/7 truck curfew on Somerville Road is likely to remove between 61 to 75 per cent of all trucks on Somerville Road. On Francis Street, a full time curfew has the potential to remove between 51 and 72 per cent of all trucks using Francis Street, as presented in Figure 36.

The remaining trucks anticipated to use Somerville Road and Francis Street are likely to have a local origin or destination along these roads, or may take greater than 30 minutes to complete the trip, indicating that the truck may stop for a period of time along the route, possibly to pick up or deliver goods (as per current observations from the Inner West Truck Survey).

Of the trucks removed from Somerville Road and Francis Street, it is estimated that up to 76 per cent of the trucks could redistribute to the Western Distributor. The further 24 per cent split across other routes such as Buckley Street and Moore Street, which are likely to have originated from the Tottenham Precinct.

In total, by implementing full-time truck curfews on Somerville Road and Francis Street, it is estimated that approximately 28 per cent of all trucks that crossed the Maribyrnong River at

Dynon Road or Footscray Road would redistribute to the Western Distributor, as presented in Figure 37.

Figure 36 – Reduction in truck volumes on Somerville Road and Francis Street due to full time truck bans

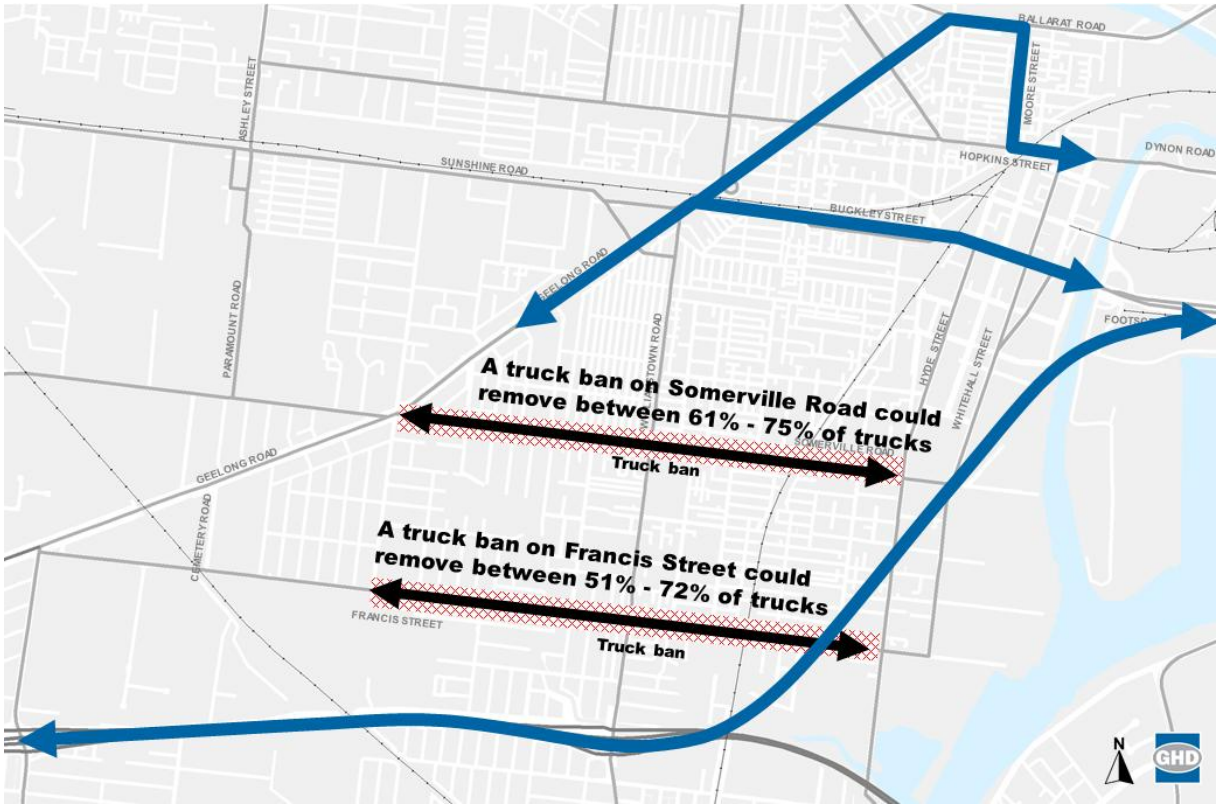
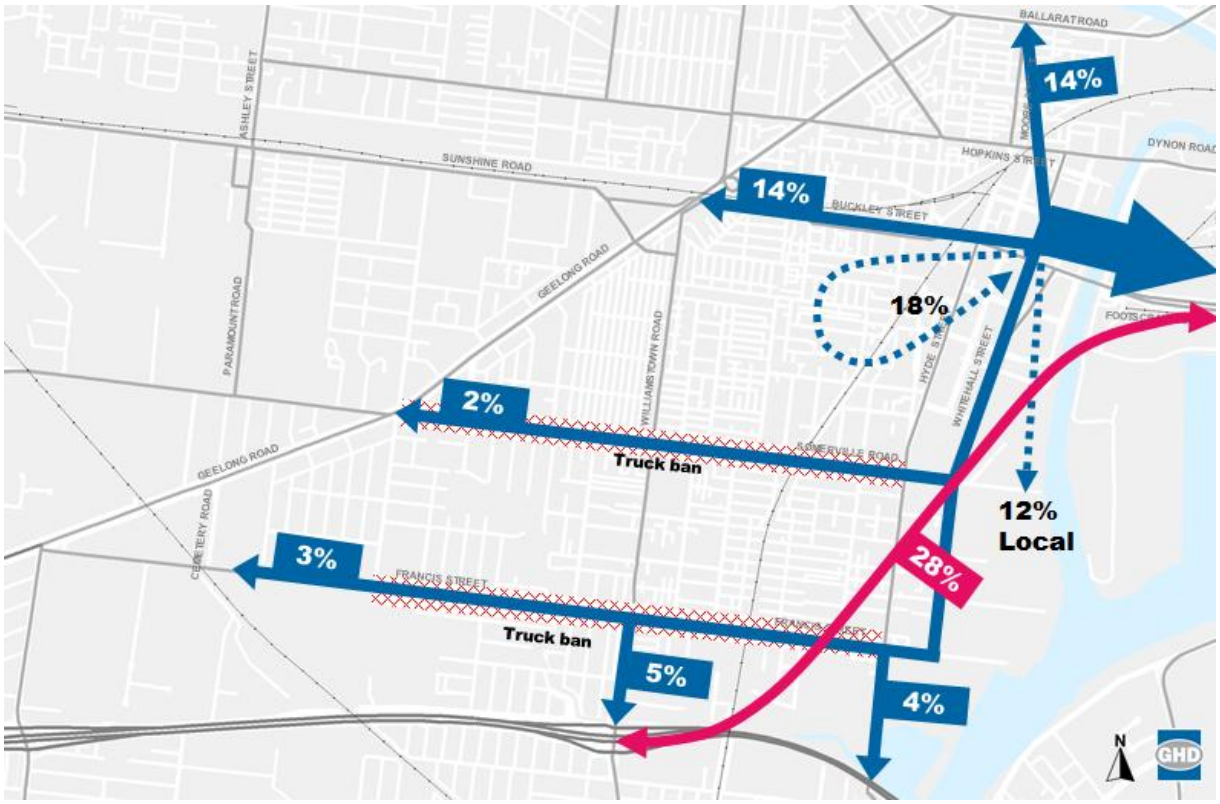


Figure 37 – Estimated truck redistribution from Western Distributor with additional curfews



4.3.3 Full Time Truck Bans on the Inner West Road Network

This section considers the potential impact of full-time truck curfews across Francis Street, Somerville Road, Buckley Street, Moore Street and Williamstown Road.

It is estimated that approximately half of all trucks that travel within the Inner West have no origin or destination within the Inner West[9]. It follows that approximately half of all trucks that were observed to have no purpose within the Inner West (including those with an origin/ destination in Tottenham) could potentially be removed from the Inner West local road network if full time truck bans were implemented across Francis Street, Somerville Road, Buckley Street, Moore Street and Williamstown Road. Such trucks would then be forced to redistribute elsewhere.

Assuming full compliance with the truck curfews, the majority of the trucks removed from the Inner West road network may redistribute to the West Gate Freeway and CityLink corridors, including many of the Tottenham-related trucks.

However, Tottenham-related trucks would no longer have a direct route to the Port of Melbourne, with trucks travelling between Tottenham and the Port having to take a longer, more costly route by initially backtracking south-west towards the West Gate Freeway. Consequently, it is likely that there will be less than full compliance with an Inner West full-time truck ban. As a full truck ban on Inner West roads increases the distance travelled and travel times for trucks traveling between the Tottenham Precinct and the Port of Melbourne, some drivers may choose to ignore the ban due to the more direct route offered by the local arterial road network.

Consideration of options for the management of trucks with a destination in the Inner West Precinct (e.g. Yarraville/Spotswood fuel storage facilities) would also need to be assessed as to whether they would continue to be exempted from these curfews.

While direct access to and from the West Gate Freeway would be provided via Hyde Street ramps for traffic travelling to and from the west, eastbound traffic would continue to seek the most direct access to the Freeway via Francis Street and Williamstown Road to travel across the West Gate Bridge.

The options for consideration could include:

- Continuing an exemption for fuel tankers in the Yarraville/ Spotswood area from curfews in Francis Street enabling fuel tankers seeking access to the east to use this route to the West Gate Bridge; and
- Enforcing a total 24/7 ban on Francis Street and Somerville Road resulting in eastbound tankers from the Yarraville area travelling via Whitehall Street, Footscray Road and CityLink or Wurundjeri Way to City Road (as placarded loads tankers do not have access to the CityLink tunnels).

The reduction in fuel refining facilities in Australia in recent years could also potentially impact this scenario and fuel companies in the Yarraville/Spotswood area if a similar trend occurs in Victoria, and this may lead to the need to increase storage capacity in the area with a resulting possible increase in truck trips originating from this area in the future. Further information of forecast volumes will be necessary to provide a full basis for decision making in this area.

This is discussed further in Section 5.

4.3.4 HPFV Network Improvements

The current network capabilities for HPFV traffic is largely focussed on light freight and empty containers with an ability to travel to most areas of the Melbourne road network. Mass based

[9] Inner west traffic surveys 2013

options are restricted to permitted movements supported by Performance Based Standards (PBS) scheme technology assessments.

As part of the development of the Western Distributor project, all new structures constructed for the Western Distributor will be built to SM1600 and all existing bridges along the West Gate Freeway between the M80 interchange and Williamstown Road will be strengthened to 75 per cent of SM1600, which will accommodate up to 110 tonne loads. These network improvements will allow direct Port Precinct access to the Swanson Dock area for mass based HPFVs travelling from industrial precincts to the north and west of Melbourne including access via the Western and Princes Highways.

This provides an incentive for freight operators to invest in HPFV vehicles with increased capabilities and efficiency. The scope of access provided by these changes will provide logistics operators with the flexibility to utilise the vehicles for a range of tasks, including, but not exclusive to Port of Melbourne based trips.

Cubic based HPFV vehicles will be able to choose between route options across the West Gate Bridge or via the Western Distributor tunnel, while mass based HPFVs will use the Western Distributor tunnel as they will remain restricted in access to the West Gate Bridge. However, a significant percentage of the loads to and from the Port will be able to access via the West Gate Bridge as average container weights remain within existing mass limits.

A mass based HPFV wishing to access the Webb Dock area will need to use the Western Distributor Tunnel and the Bolte Bridge or Wurundjeri Way to reach the Webb Dock area.

The Western Distributor increases the opportunity to use HPFVs and as a direct result improves the productivity of the freight network by allowing the movement of greater freight volumes with fewer movements. This will prove increasingly important as the port capacity expands through growing trade and the expansion of the Webb Dock, as well as the trend for greater freight travel distances as industrial land relocates further from the port

4.4 Impact on Freight Network Resilience

The Western Distributor project will provide improved network resilience in the western areas of Melbourne providing an additional access across the Maribyrnong River and an alternative to the West Gate Bridge access to the city and north of Melbourne.

Increased capacity on the West Gate Freeway will address some delay issues in travel times, particularly at the western end of the West Gate Freeway where access capacity has been stretched during peak periods.

The alternate routes provided by the Western Distributor will provide increased options during periods of disruption or where accidents restrict or constrain roadway use, effectively a bypass of the West Gate Bridge would be available in an accident scenario on the bridge.

The Western Distributor's contribution to improved network resilience for the freight industry includes:

- Provision of a viable and efficient alternative crossing of the Maribyrnong River to the West Gate Bridge;
- Provision of an alternative for city traffic and east/west freight traffic;
- Spreading of traffic build ups from the west across a broader spectrum of road access;
- Collection of city and westbound traffic to filter this to the West Gate Freeway rather than running through Inner West streets;
- Provision of network redundancy for east to west access including during periods of disruption and incidents;

- Reduce the reliance of access through inner suburban streets for trucks working in the industrial areas of Newport and Footscray; and
- Ramps to the Hyde St area to provide a direct access to the West Gate Freeway to the west.

4.5 Impacts of Road Tolling on Freight

In general, logistics operators will select or optimise transport routing according to a commercial balance of cost, vehicle productivity time, and client (beneficial freight owner) service (pick-up/delivery) needs.

The trip cost for a truck on a particular route will be a function of distance, time (average speed), per km running costs, any direct charges associated with the route (such as tolls or permit costs), and the allocation of equipment capital costs and fixed overheads which depend upon the daily productivity of the vehicle (average number of paid trips per day).

In the case of a freight road network comprising only freeways, then the likely behaviour of the logistics operator will be to choose the route with the least cost impact:

- If a route is both the shortest and quickest then this will clearly be seen as the optimal choice.
- If a shorter route has a longer transit time or a longer route has a shorter transit time, then route choice behaviour will be driven by the overall trip cost trade-off between distance and time (which means productivity).

When a route or sections of a route include tolled roads then this cost component will be added to the trip cost calculation. That is, the levels of tolling charges will have certain demand elasticities which will either deter or encourage route choice by a logistics operator.

There is likely to be a tipping point of tolling where a logistics operator will seek an alternative (freeway or cheaper tolled) route trading off an extra distance and time with savings in toll charges. If a tolled road or section allows for time savings compared with a freeway alternative then effectively the ideal tolling charges would be up to the breakeven point of time savings versus the toll cost.

Similarly, the toll trade-off decision made by logistics operators is also influenced by the stop-start nature of the arterial road network, whereby trucks running on arterial roads with multiple signalised intersections will need to stop and then work their way back up the gears before they have to stop again at another signalised intersection, again incurring a higher operating cost compared to those on a freeway environment. Consequently, a tolled freeway may represent better value for money for some truck fleet operators.

Single Trip or Multi Trip Tolls

Another driver of logistics operator route choice in a tolled situation is whether the tolling is direct trip related or for a fixed (day) period. In the case of a trip charge, the impact of the charge cannot be reduced by the logistics operator. However, in the case of a day (fixed period) charge, the logistics operator can reduce the per trip cost by being more productive, i.e. with multiple trips during the charge period.

A reasonable fixed period charge for a logistics operator regularly using the route during the day is likely to have less impact (elasticity effects) than a direct trip charge (unless it offers significant net savings for the operator over an alternative roadway option).

Incentives for Use

A key element of tolling options is to establish a pricing level which provides an incentive for use. This required assessment of the total network and origin and destination examples where journeys are balanced in time saving and pricing with a positive outcome for the user.

The alternative positioning of “no other alternative routes” provides every incentive for users to investigate alternative options which may not be intended in the infrastructure design.

Specific Examples of Potential Trips and Impacts

- Container park bulk delivery runs to the Port of Melbourne are an obvious example where a larger truck option with multiple runs using a 24 hour fixed day rate can be incentivised by the opportunity to pay one toll and use the route 4-6 times in a 24 hour period. The cost of the toll reduces with each additional trip and becomes irrelevant to the user.
- Traffic impacts are reduced through a reduced number of vehicles and options to save money and provide efficient trips in off peak periods.
- Single container runs (one way loading) typically a smaller operator with no return load. This example is impacted by a potential tolling cost in both directions whereas the revenue earning trip is only one direction. There is an argument that this may be a penalty in the short term, however, it may drive incentives for increases in two-way loading to spread the tolling cost.

5. Project Findings and Inner West Network Management

The implementation of the Western Distributor project will generally provide a direct and more efficient connection between the West Gate Freeway and the Port of Melbourne/Dynon Precinct. Truck traffic utilising the West Gate Freeway with an origin or destination of the POMC/Dynon Precinct will generally be provided with a quicker and more direct route. Traffic with destinations to the north and east of the city will also benefit from quicker access to their CityLink connections.

Truck trips from the industrial and freight precincts in the outer west, Altona, northern and regional areas travelling along the West Gate Freeway will potentially reduce their travel times[10] to the Port/Dynon Precinct and obtain efficiencies in labour and fuel usage.

The truck traffic from the Inner West Precinct of Tottenham (Including Brooklyn) and local Yarraville Precincts, however, tend to utilise local connections to the Port/Dynon Precinct and are less likely to choose to travel via the Freeway and a new road tunnel to access the Port.

Logistics providers in these inner precincts will wish to use direct routes with least distance and the fastest travel times to keep costs low. Managing the routes accessed by these local logistics operators will require a more specific approach based on understanding:

- Their local access to the road network;
- Viability of access via the Freeway and particular links;
- Travel distances;
- Trip times to the Port/Dynon Precinct; and
- Access and curfew options within the Inner Western Suburbs.

To assess and understand the appropriate strategy to address these operators it will be necessary to reduce the area of focus and drill down into site, or “zone”, based information to address issues within the precincts.

These assessments are then tested against potential curfew and access restriction options in the Inner West residential precincts to compare results and provide the basis of future planning directions.

Section 4 (above) provides an in-depth look at the Tottenham and Yarraville Precincts and explores different operators’ access the road network and the subsequent influences their route choices.

5.1 General Options for Freight Network Management in the Inner West

5.1.1 Tottenham Precinct

The Western Distributor project provides a significant step towards improving the network connections to the west of Melbourne, as well as improving the amenity of local residential streets through the reduction of trucks from the Inner West. In the longer term, further major infrastructure investment may be required. However, until further projects are initiated there will

[10] An analysis of travel time savings associated with the Project is provided in the Western Distr butor Network Impact Assessment report.

be a need for subsidiary network management measures to monitor and maintain ongoing issues in the area.

The current controls in the Inner West are truck curfews impacting movements from the West Gate Freeway and Tottenham Precinct to and from the Port Precinct.

A number of possible control pathways to address the demand from Tottenham and Williamstown Road areas have been explored, namely:

- Western Distributor with full time truck ban on Francis Street and Somerville Road (this is the preferred Project Case);
- Western Distributor with full time truck ban on Francis Street and Somerville Road, with extended curfew on Moore Street with Tottenham exemption;
- Western Distributor with full time truck ban on Francis Street and Somerville Road, removal of Tottenham exemption on Moore Street;
- Western Distributor with full time truck ban on Francis Street and Somerville Road, full time truck ban on Moore Street; and
- Western Distributor with full time truck ban on Francis Street, Somerville Road, Buckley Street and Moore Street.

The impact of each possible pathway will have varying degrees of effectiveness on reducing truck volumes on local roads, and varying impacts on the truck industry, with the estimated impacts summarised in Section 4 and Figure 38.

Figure 38 – Trucks in the Inner West Control Pathways

		Project Case			Example of possible pathways				
		2021 base case (do nothing)	2021 project case, no changes to existing truck curfews	Western Distributor with Francis Street and Somerville Road truck bans	Western Distributor with Francis Street and Somerville Road truck bans and extended Moore Street curfew hours	Western Distributor with Francis Street and Somerville Road truck bans with removal of Tottenham exemption on Moore Street	Western Distributor with Francis Street, Somerville Road and Moore Street truck bans and upgrade to Buckley Street	Western Distributor with full truck bans on Francis Street, Somerville Road, Buckley Street & Moore Street	Eddington Northern Alignment
Scope	Infrastructure investment	None	Western Distributor	Western Distributor	Western Distributor	Western Distributor	Western Distributor + upgrade of Buckley Street to a designated freight route	Western Distributor	Eddington Northern Alignment
	Francis Street + Somerville Road truck curfews	No changes to existing curfews (night curfew and Somerville Rd school peak curfews)	No changes to existing curfews	24/7 truck ban	24/7 truck ban	24/7 truck ban	24/7 truck ban	24/7 truck ban	24/7 truck ban
	Buckley Street truck curfews	No curfew	No curfew	No curfew	No curfew	No curfew	No curfew	24/7 truck ban	24/7 truck ban
	Moore Street truck curfews	No changes to existing curfews (night curfew with Tottenham exemption)	No changes to existing curfews	No changes to existing curfews	Extend current curfew hours, retaining Tottenham exemption	Retain night and weekend curfew, remove Tottenham exemption	24/7 truck ban	24/7 truck ban	24/7 truck ban
Percentage Redistribution from Inner West to Western Distributor		N/A	22%	28%	Greater than 28%	Greater than 28%	Greater than 28%	Greater than 50%	50% to 80%
Truck volumes on Francis Street		N/A	↓↓	↓↓↓	↓↓↓	↓↓↓	↓↓↓	↓↓↓	↓↓↓
Truck volumes on Somerville Road		N/A	↓↓	↓↓↓	↓↓↓	↓↓↓	↓↓↓	↓↓↓	↓↓↓
Truck volumes on Buckley Street		N/A	↓	↓	↑↑	↑↑	↑↑↑	↓↓↓	↓↓↓
Truck volumes on Moore Street		N/A	↓	↓	↓	↓↓	↓↓↓	↓↓↓	↓↓↓
Impact on freight industry		N/A	Positive impact	Neutral to positive impact	Neutral	Negative impact	Neutral to negative impact	Negative impact	Positive impact

Many of the truck curfew pathways presented above, including full time truck bans, rely on suitable alternative infrastructure to be provided for Tottenham-related trucks to access the Port of Melbourne. Options for further management interventions in this area could include additional road upgrades achieved by (note that these have not been considered as part of the project, but are presented merely as options):

- A new or upgraded reliable connection between Geelong Road and the Port of Melbourne (e.g. parallel to Buckley Street) or between Ballarat Road and the Port of Melbourne (e.g. parallel to Moore Street) could be provided. This could be an at-grade solution or a tunnel solution.
- A new connection between Market Road and Grieve Parade could improve connectivity for trucks travelling between the western areas of the Tottenham Precinct and the Port of Melbourne via the Western Distributor. This connection may also become necessary as Webb Dock grows and if/when existing quarries are converted to alternate uses.
- Extending Paramount Road to Geelong Road could improve connectivity for freight within the Tottenham Precinct to access the M1 corridor at Millers Road. The potential suitability of this link would depend on the location of Western Distributor tunnel portals within the West Gate Freeway.
- Changes to land use to minimise the number of freight generating industries that reside within Tottenham.

5.1.2 Yarraville Precinct

Similar issues arise in relation to vehicles moving to and from the Yarraville Precinct with particular emphasis on the fuel tanker distribution. The Western Distributor project will provide improved access to the west via ramps to and from the West Gate Freeway to and from the west. However, movements to the east and north may be further impacted by Francis Street restrictions.

While tankers in the Yarraville/Spotswood Precinct currently have an exemption for access along Francis Street (to access the West Gate Freeway in either direction), there is also a high likelihood of increases in tanker traffic aligned to increased storage capacity in the area and a reduction of local fuel refining facilities.

Network management measures to control this traffic in the Francis Street area will effectively have two key options for consideration:

- Provide a continued exemption for local tanker traffic to access Francis Street to reach Williamstown Road and the West Gate Freeway to the east.
- Do not continue with the exemption for tanker vehicles in Francis Street, resulting in eastbound traffic needing to travel via Hyde and Whitehall Streets to Footscray Road. Northbound traffic would utilise CityLink while eastbound traffic would choose between the Bolte Bridge and Wurundjeri Way to reach City Link and access to the east of Melbourne. Tolling options may impact these route choices.

Supporting infrastructure which may be considered in the options for management measures for this traffic could include West Gate Distributor components of:

- Upgrade to Whitehall Street and its intersection with Footscray Road; and
- Shepherds Bridge capacity.

6. Conclusions

The Western Distributor project will provide a number of improved access outcomes to the Port Precinct and improve flexibility and resilience in the east west freight network connections. Key access routes for the major industrial/freight precincts in the outer west and northern suburbs will potentially have increased access with shorter travel times on the major routes.

The ramp access to the West Gate Freeway from Hyde Street will also provide a convenient access for freight generators in Yarraville and reduce the volume of trucks that travel on residential roads. It will also provide a suitable tunnel bypass for over-height and placarded vehicles.

The proposed Western Distributor Project will reduce truck volumes in the Inner West by up to 28 percent, with the most significant reductions occurring on Francis Street and Somerville Road. According to traffic modelling, the project will also remove approximately 4,000 to 6,000 trucks per day from the West Gate Bridge.

There are however key freight-related precincts in the Tottenham and Yarraville areas which will continue to require access to local arterial roads. Traffic movements from these precincts are likely to require ongoing management of route access and curfews in the Inner West areas to manage progressive demand requirements and the balance of impacts versus efficiency options for both the community in the Inner West and for the efficiency of the broader network.

Toll pricing options have the potential to alter some of the impacts and preferred industry routing indicated in this report and these sensitivities will require detailed examination to ensure they provide the fit and outcomes required within the Project.

The timing of management controls on the network will also be important to inform industry of the preferred options and outcomes to drive further behaviour changes and realign of routing to meet the adjusted network aims.

Appendices

Appendix A – Recent Major Transport Studies

Introduction

This section outlines the recent major transport studies influencing the Inner West

2008 - East West Link Needs Assessment (Eddington)

This was a major transport study, published in April 2008, undertaken to assess east west movements across Melbourne. The report contained a number of recommendations:

- A new rail link from Sunshine to Werribee to improvement the reliability of regional rail services;
- A new Melbourne Metro rail tunnel to link the western and south eastern suburbs;
- A new 18 kilometre east west tunnel to connect the western suburbs with the Eastern Freeway;
- A Truck Action Plan to remove truck traffic from the local streets in Footscray and Yarraville; and
- Other smaller public and sustainable transport initiatives.

Many of the recommendations of the Eddington Report are discussed in the following subsequent subsections.

2015 - Western Distributor (Transurban)

The Western Distributor is a market led proposal by Transurban to create a new link between the West Gate Freeway at Williamstown Road to the CityLink and Footscray Road interchange. It is proposed to take the form of a tunnel and viaduct and provide an alternative river crossing to the West Gate Freeway. The project will also provide additional lanes on the West Gate Freeway between the M80 and the West Gate Bridge to improve capacity.

Benefits

According to documents presented by Transurban the Western Distributor proposal will[11]:

- Nearly halve travel time heading into the city from the M80 interchange during morning peak
- Wipe around 15 minutes off city trips from Geelong and Ballarat
- Enable three times faster trips to the Port of Melbourne
- Provide a second river crossing, reducing reliance and pressure on the West Gate Bridge
- Bypass up to 14 sets of traffic lights
- Take up to 50 per cent of trucks off local roads in the inner west, improving liveability
- Enable safer and conflict free cycling routes
- Improve safety with a fit-for purpose motorway network
- Provide more consistent travel times
- Create 3500 construction jobs and enhance opportunities for job seekers in the west

[11] *Source: Transurban, 28/5/2015, http://consult.transurban.com/western-distributor-join-the-conversation)*

- Boost freight productivity and the Victorian economy”

Figure 39 provides a schematic layout of the proposed Western Distributor.

Figure 39 Western Distributor Schematic Layout

2014 - West Gate Distributor (WGD)

The West Gate Distributor is a proposal to remove the current capacity constraints on the West Gate Bridge and the projected growth in truck movements in and out of the Port of Melbourne (in the coming years. This would be achieved by a new ramp from the West Gate Freeway to Hyde Street.

Benefits:

- Removal of an estimated 5,000 trucks from the West Gate Bridge each day.
- Easy connection from western freight movement to the Port of Melbourne.
- Ease congestion for city bound commuters from Geelong, Ballarat and the western suburbs.
- Create a new gateway to the CBD from the west

The majority of this project is not currently a government priority. The Northern Section of the West Gate Distributor remains a current project.

Figure 40 shows a screenshot of the proposed alignment of the West Gate Distributor.

Figure 40 West Gate Distributor Indicative Route

2014 - West Gate Distributor (WGD) – Northern Section

The West Gate Distributor (WGD) – Northern Section is part of the broader West Gate Distributor project. However, it does remain a current project (as of January 2015).

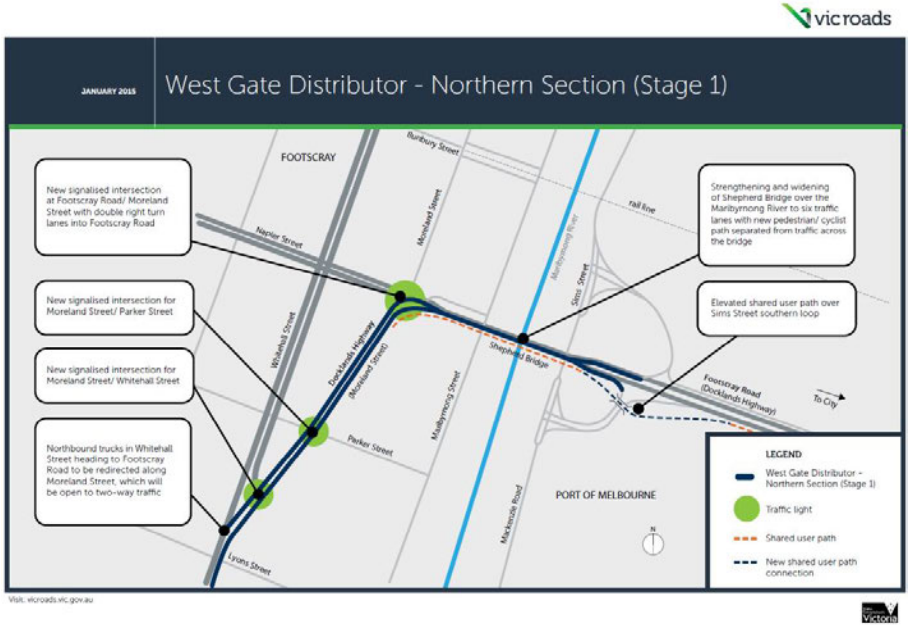
Benefits:

The northern section of the WGD will deliver benefits including improved freight access to and from the Port of Melbourne and improve movement for local traffic, by:

- Widening of Moreland Street to provide a 4 lane divided road, with an upgraded connection to Footscray Road;
- New signalised intersections at Footscray Road, Parker Street and Whitehall Street with Moreland Street; and
- The widening and strengthening of Shepherd's Bridge over the Maribyrnong River.

Figure 41 shows a screenshot of the schematic layout of this project.

Figure 41 West Gate Distributor Northern Section Schematic Layout



2014 - East West Link – Western Section

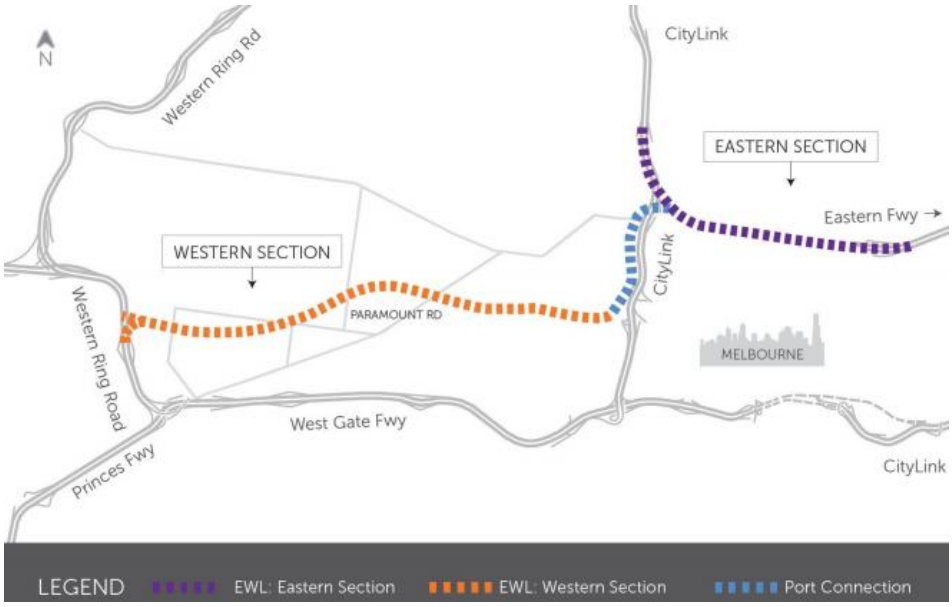
The East West Link – Western Section is a proposed 12 km freeway standard connection from the M80 Ring Road at Sunshine West to the Port of Melbourne and the proposed Eastern Section of the East West Link.

Benefits:

- Improved connectivity across Melbourne by providing a direct freeway connection between the Eastern Freeway and the M80 Ring Road.
- Improved freight efficiency through connection between the port and key industrial centres.
- Reduced reliance on the West Gate Freeway
- Allow traffic flow more freely and predictably through additional lanes across the city and an alternative to funnelling traffic to the West Gate Bridge.

Figure 42 provides a schematic overview of the East West Link – Western Section.

Figure 42 East West Link – Western Section Schematic Layout



2010 - WestLink

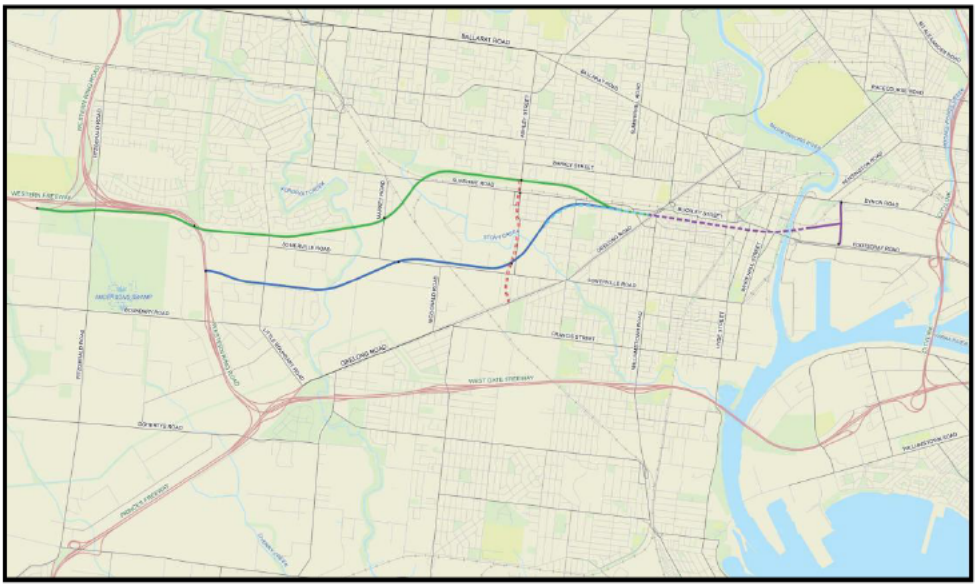
WestLink was a proposed major project in the Victorian Transport Plan (VTP) aimed at reducing congestion, removing trucks from local streets in the west of Melbourne and providing an alternative to the West Gate Freeway.

The project had two Stages: Stage 1 is a tunnel between the Port of Melbourne and the West Footscray area; and Stage 2 a longer-term road connection to the Western Ring Road.

Different route options were proposed by Linking Melbourne Authority (LMA) – refer to Figure 43

The major benefit of the WestLink project was it provides freight traffic from the west direct access to the Port of Melbourne. Additionally, it also provided traffic from Ballarat, Geelong and the western suburbs an alternative route into the city. However, without another additional road connection (such as EWL Eastern Section) several major connectivity issues arise.

Figure 43 WestLink Schematic Layout



2009 - Truck Action Plan (TAP)

The Truck Action Plan was developed by the Victorian Government in 2009. It proposed to develop a connection between the Port of Melbourne and the West Gate Freeway through Hyde and Whitehall Streets. The project objectives of the TAP was to remove non-local truck traffic from residential roads, improve truck access from the west to the Port of Melbourne on a 24 hour basis, and minimise impacts to local environmental and social elements. Strategic modelling of the TAP indicated a significant reduction in truck volumes down residential streets such as Francis Street.

2015 - Port of Melbourne Transaction

The Port of Melbourne transaction is a current Victorian government proposal to lease the Port of Melbourne for a period of 50 years.

This proposal confirms that there will be ongoing operations at Swanson and Webb dock areas in the Port of Melbourne for the foreseeable future.

2012 - Metropolitan Intermodal System (MIS)

The Metropolitan Intermodal System (now known as Port Rail Shuttles) proposes to move containers from the Port of Melbourne to suburban terminals by rail and HPFVs reducing truck traffic and impacts across the city. The project will be operated by a private operator and will deliver:

- Intermodal freight terminals located within dedicated freight and logistics precincts in the south west, north and south east
- A dedicated rail transfer facility for containers at the port
- Dedicated shuttle trains using off-peak rail network capacity
- Business systems necessary to manage information and operations across the network.

It is understood that Port-Rail Shuttle services will be operational by 2017.

2014 - Western Interstate Freight Terminal (WIFT)

The Western Interstate Freight Terminal proposes to relocate the two interstate rail container terminals in the Port/Dynon precinct to the western industrial areas and reduce truck traffic in the city areas.

The project is seen as a long term strategic option that will:

- Significantly improve the capacity of interstate freight transport in the north-south and east-west national corridors connecting Melbourne;
- Complement other improvements to the north-south intermodal rail supply chain with matching capacity and service level improvements;
- Enhance national productivity by lowering the door-to-door cost of freight for interstate movements;
- Create opportunities for urban renewal in the North Dynon area;
- Reduce truck movements through Melbourne's inner west; and
- Improve rail access for port-related freight by removing many non-port freight movements from the Dynon precinct.

Appendix B - Recent Major Traffic Studies

This section summarises existing freight movements in the Inner West study area. Data has been sourced from a number of different publically available documents including:

- Port of Melbourne and Dynon Rail Terminals 2009 Container Logistics Chain Study;
- Port of Melbourne Traffic Surveys (2013); and
- VicRoads Inner West Truck Surveys (2014).

1. Existing Broad Freight Origins/Destinations

The Port of Melbourne and Dynon Rail Terminals 2009 Container Logistics Chain Study examined the origins and destinations of containers through the Port of Melbourne.

The study captured the movement over 75,000 individual containers which were each linked to provide an accurate description of the sampled container movements, including empty containers, along the supply chain.

For metropolitan Melbourne, more than two thirds of containers were imports, while the opposite was true for regional and interstate destinations (i.e. more than two thirds related to exports).

Table 7 shows a geographical breakdown of container movements.

Table 7 Existing PoMC Broad Origins/Destinations

	Imports		Exports	
Area	TEU	%	TEU	%
Inner Melbourne	61,321	7.5%	75,590	14%
Outer Eastern	74,075	9.1%	3,756	0.7%
Outer Northern	157,362	19%	38,218	6.9%
Outer South East	204,827	25%	37,091	6.7%
Outer Western	215,414	26%	142,542	26%
Metropolitan Total	**713,000**	**87%**	**297,197**	**54%**
Eastern Corridor	3,318	0.4%	34,636	6.2%
Goulburn Corridor	1,916	0.2%	747	0.1%
Hume Corridor	4,167	0.5%	376	0.1%
North Western Corridor	2,521	0.3%	4,250	0.8%
Peninsula	761	0.1%	4,132	0.7%
South Western Corridor	8,537	1.0%	32,046	5.8%
Western Corridor	2,270	0.3%	54,096	9.7%
Regional Victoria Total	**23,489**	**2.9%**	**130,283**	**23%**
New South Wales	21,195	2.6%	59,278	11%
Northern Territory	147	0.0%	-	-
Queensland	7,434	0.9%	3,044	0.5%
South Australia	47,306	5.8%	65,166	12%
Western Australia	4,028	0.5%	186	0.0%
Interstate Total	**80,110**	**9.8%**	**127,675**	**23%**
Australia Total	816,599	100%	555,155	100%

Source: Port of Melbourne CLCS 2009

Figure 44 depicts the movements of all containers (imports and exports) to and from the Port of Melbourne by direction, as detailed in the Port of Melbourne 2009 Container Logistics Chain

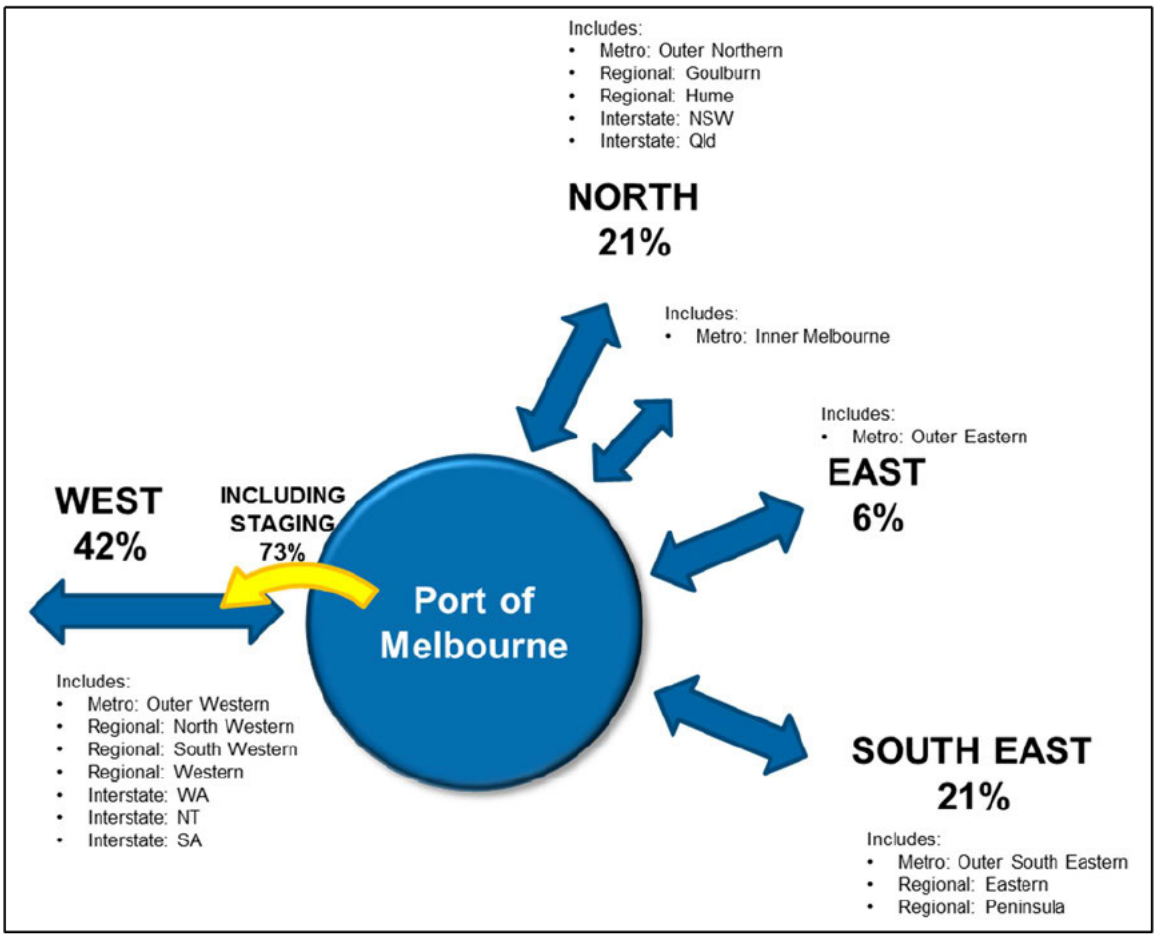
Study. Please note that this figure presents the ultimate origin/destination of containers and does not include staging. It can be seen that the west is the most common origin and destination for containers (42% of the total).

However, when including staging, 73% of all truck movements exiting the POM Swanson precinct move to the western suburbs

In 2009, 74% of all containers through the Port of Melbourne had a final origin or destination in Metropolitan Melbourne. The remainder went to/from regional Victoria or interstate.

In the future, the growth of Melbourne's freight and logistics related businesses will grow to the North and West of Melbourne, and accordingly it is expected that the proportion of containers that move to/from the north and west will also increase.

Figure 44 Existing PoMC Broad Origins/Destinations



2. Existing Webb Dock Truck Patterns

This section presents the truck patterns observed at Webb Dock in September 2012, sourced from the Port of Melbourne Traffic Surveys (2013). It should be noted that this data was collected before expansion works commenced at Webb Dock.

Webb Dock currently services auto trade and interstate container trade and generates approximately 2,300 trucks per day. The ultimate capacity of Webb Dock has previously been published as increasing by between 1 million TEUs (PoMC) per annum and 1.4 million TEUs per annum (VICTL) in addition to today's throughput. This would result in an increase of between 2,000 to 3,000 trucks per day, an approximate doubling of truck volumes from today.

Furthermore as the type of trade that moves through Webb Dock changes, and as Melbourne's industry moves towards the west and north, it is anticipated that the volume of trucks that move to/from the west and over the West Gate Bridge will increase significantly.

Table 8 summarises the daily truck movements observed at Webb Dock.

Table 8 Webb Dock Daily Truck Movements

	Inbound	Outbound
Total Trucks	1,173 trucks/day	1,169 trucks/day
Truck Type		
Container trucks (Average TEU per truck of approximately 1.25)	56%	55%
Pantech/Tautliner	19%	18%
Car Carrier	10%	9%
Other	15%	18%
Time of Day		
6am-10am	27%	28%
10am-4pm	49%	47%
4pm-8pm	12%	13%
8pm-6am	12%	12%
	Peak period: 11am-1pm	

Source: Port of Melbourne Port Truck Survey (2013)

Figure 44 and Table 9 summarise the inbound and outbound direction of truck movements at Webb Dock. Approximately two out of every five trucks that visit Webb Dock travelled via the West Gate Bridge and approximately one in every five trucks travelled via City Link.

Figure 45 Existing Webb Dock Truck Patterns

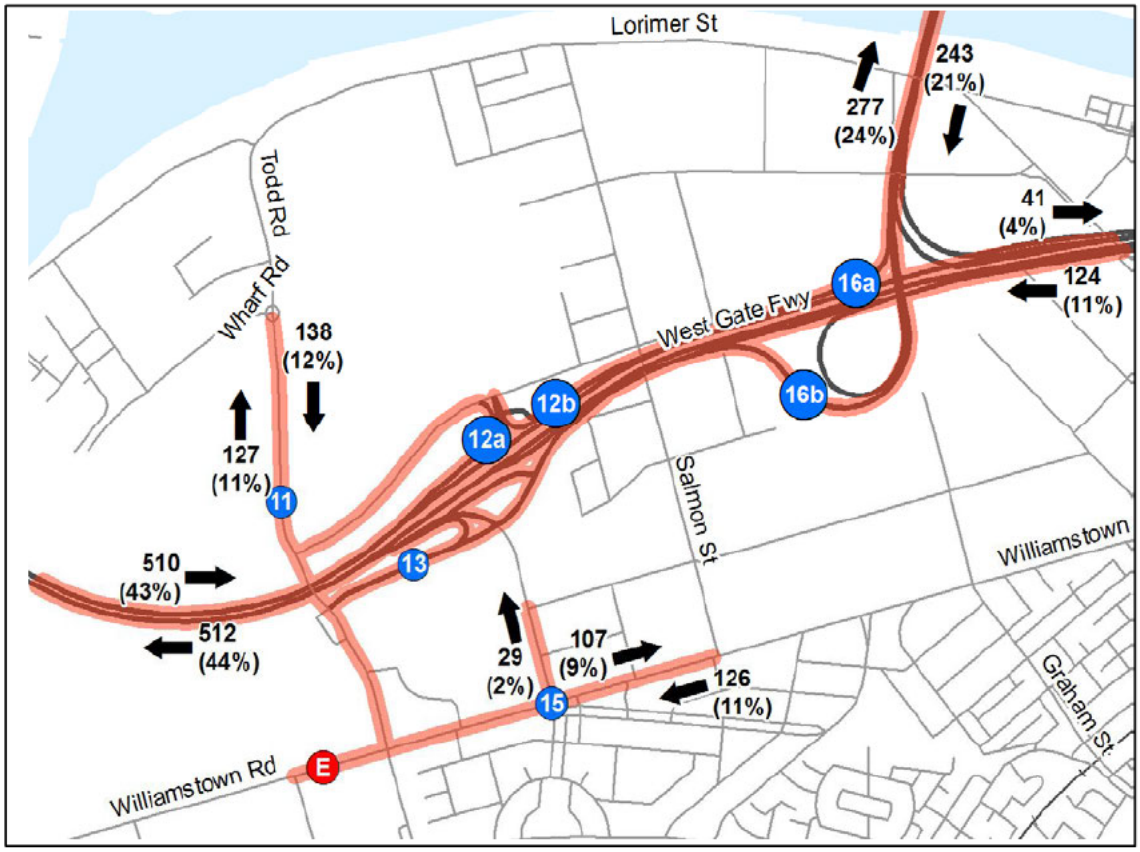


Table 9 Existing Webb Dock Truck Patterns

To/From	Inbound	Outbound
WGF (west)	43%	44%
WGF (east)	11%	4%
City Link	21%	24%
Todd Road	12%	11%
Williamstown Road	11%	9%
Prohasky Street	-	2%
Other	2%	6%

Figure 45 and Table 10 summarise the inbound and outbound direction of container truck movements at Webb Dock. Container truck travel patterns are relatively similar to the overall truck patterns, with a slight increase via Todd Road/Lorimer Street (presumably heading to Wurundjeri Way) and a slight reduction via Williamstown Road.

As Webb Dock expands as a container terminal it is anticipated that the proportion of container trucks heading to/from the west will increase.

Figure 46 Existing Webb Dock Container Truck Patterns

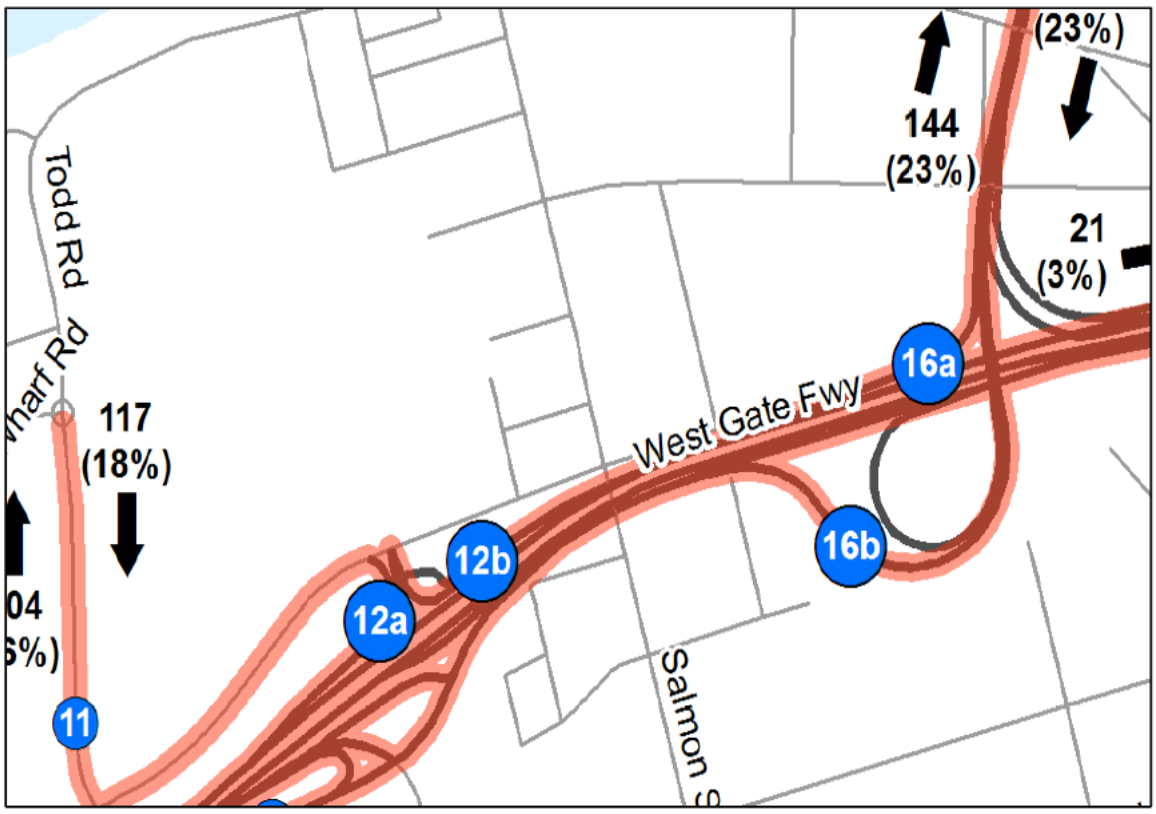


Table 10 Existing Webb Dock Container Truck Patterns

To/From	Inbound	Outbound
WGF (west)	39%	43%
WGF (east)	11%	3%
City Link	23%	23%
Todd Road	18%	16%
Williamstown Road	7%	5%
Prohasky Street	-	4%
Other	2%	6%

Figure 47 summarises movements between Webb Dock and the Swanson and Dynon Precincts. Over a 24 hour period, 584 trucks were observed travelling from Webb Dock to the Swanson-Dynon precinct whilst 562 trucks travelled in the opposite direction. More specifically to this study:

- For trips from Webb Dock to the Swanson-Dynon precinct (northbound), 79% went to the Swanson Dock precinct (i.e. port) and 21% went to the Dynon Rail precinct.
- For trips from the Swanson-Dynon precinct to Webb Dock (southbound), 76% came from the Swanson Dock precinct (i.e. port) and 24% came from the Dynon Rail precinct.
- 40%-50% of all trips between Webb Dock and Swanson Dock took less than 30 minutes (i.e. "direct" trips). Other trips most likely had interim destinations.

Figure 47 Existing Webb Dock to Swanson/Dynon Truck Patterns

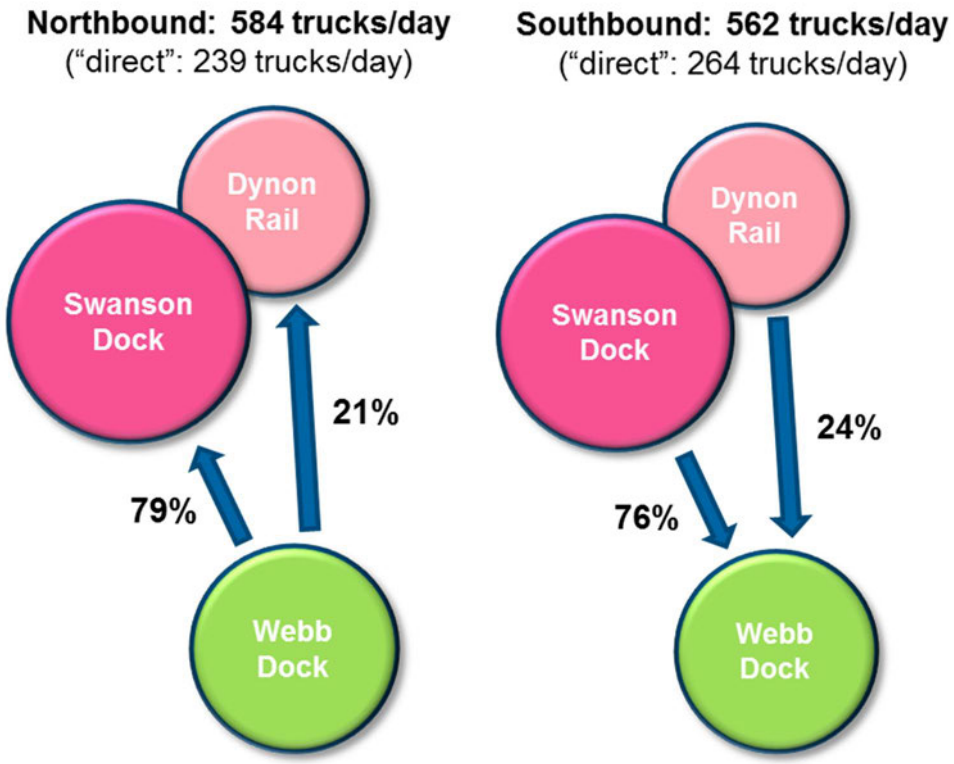
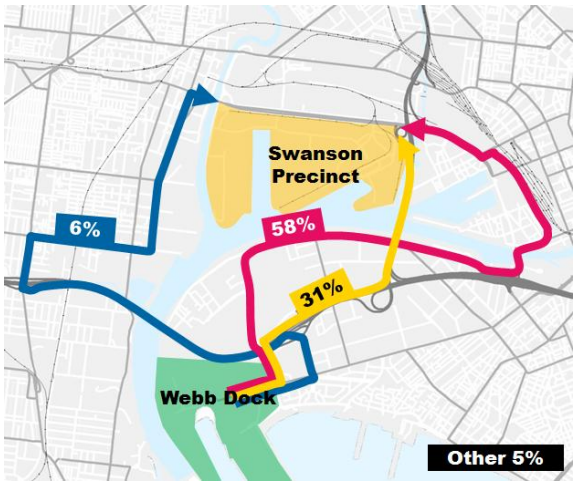


Figure 48 summarises existing Webb Dock to Swanson/Dynon Precinct northbound direct trips and Figure 49 summarises existing Swanson/Dynon Precinct to Webb Dock southbound direct trips. It can be seen that Wurundjeri Way and CityLink are the most common routes in both directions.

Figure 48 Existing Webb Dock to Swanson/Dynon Northbound Truck Patterns

Northbound “direct” trips to Swanson



Northbound “direct” trips to Dynon

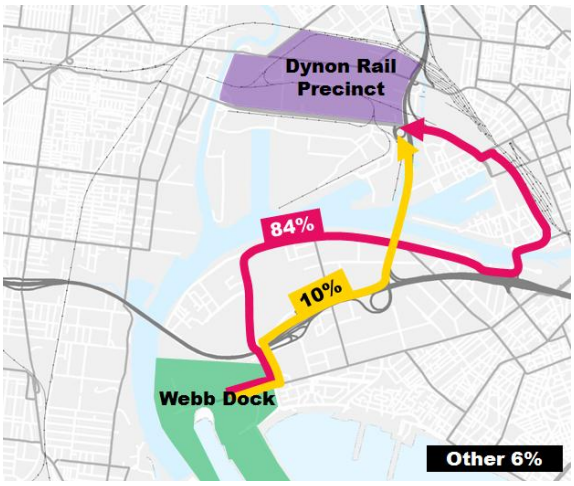
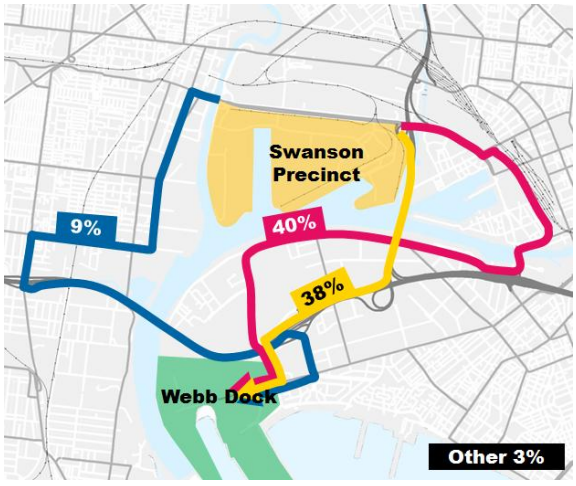
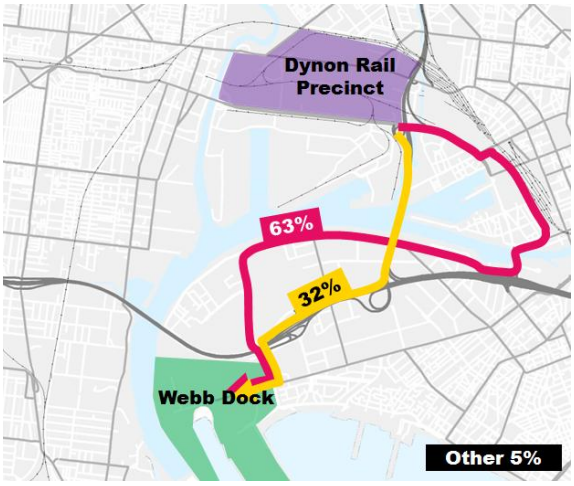


Figure 49 Existing Swanson/Dynon to Webb Dock Southbound Truck Patterns

Southbound “direct” trips from Swanson



Southbound “direct” trips from Dynon



3. Existing Swanson/Dynon Precinct Truck Patterns

Table 11 and Figure 50 summarise existing Swanson and Dynon Precinct truck patterns.

Table 11 Existing Swanson and Dynon Precinct Truck Patterns

Swanson/Dynon Precinct:	Inbound	Outbound
Total Trucks:	5,657 trucks/day	5,744 trucks/day
Proportion that head to/from west	73%	72%

Figure 50 Existing Swanson/Dynon Truck Patterns

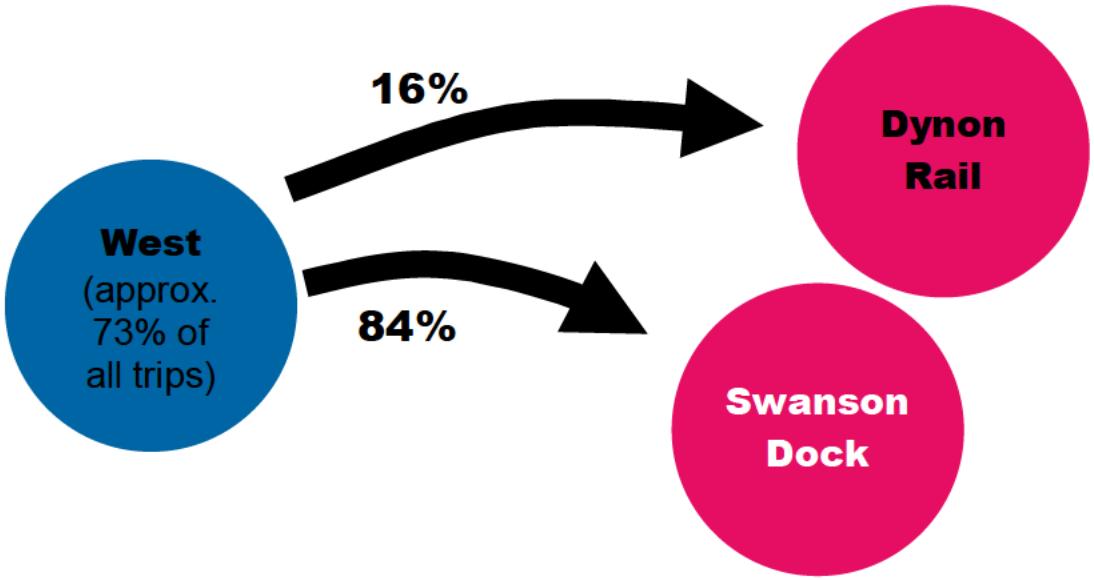


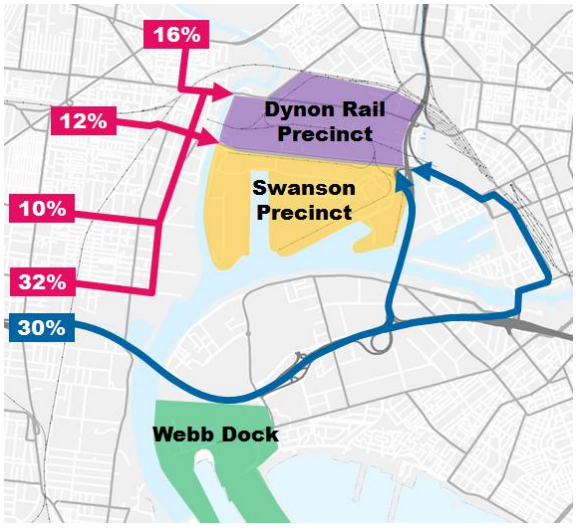
Figure 51 summarises existing truck movements between the Swanson/Dynon Precinct and the west over a typical 24 hour period. Figure 52 summarises existing truck movements between the Swanson/Dynon Precinct and the west during curfew periods (8pm-6am).

The following trends can be observed:

- During curfew periods trucks tend to use Moore Street, the West Gate Freeway, CityLink and Buckley Street;
- There are a higher proportion of trucks that use the West Gate Freeway and CityLink inbound compared to outbound; and
- There are a higher proportion of trucks that use Buckley Street outbound compared to inbound.

Figure 51 Existing Swanson/Dynon Truck Patterns to/from West (24 Hours)

Inbound: from the west



Outbound: to the west

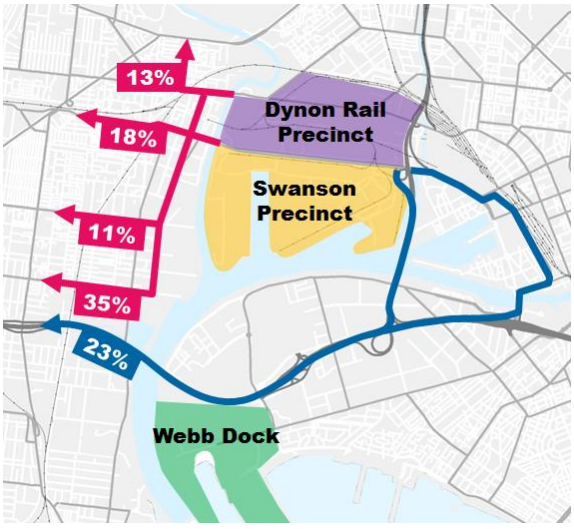
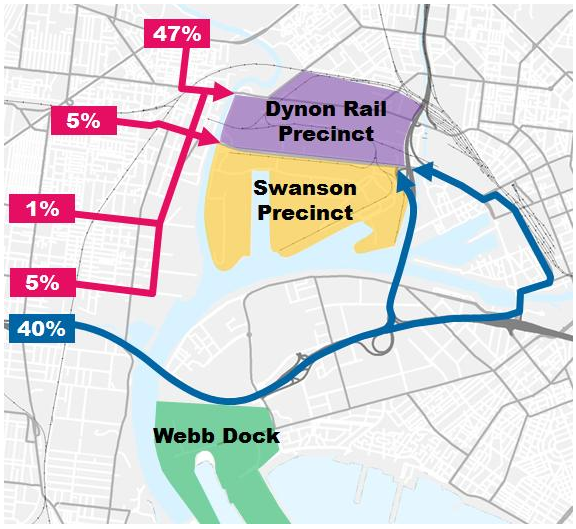


Figure 52 Existing Swanson/Dynon Truck Patterns to/from West (Curfew)

Inbound: from the west



Outbound: to the west

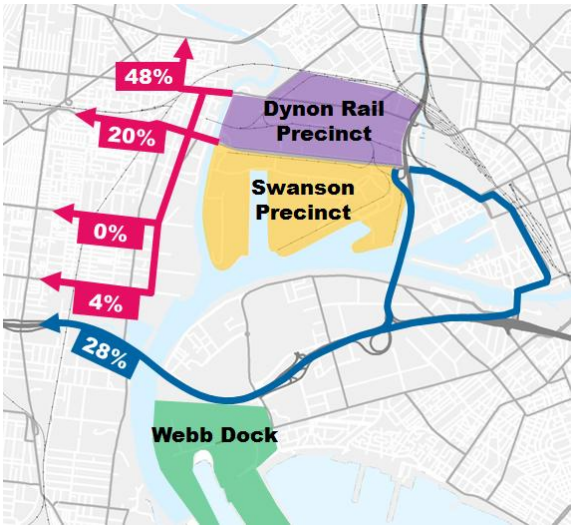
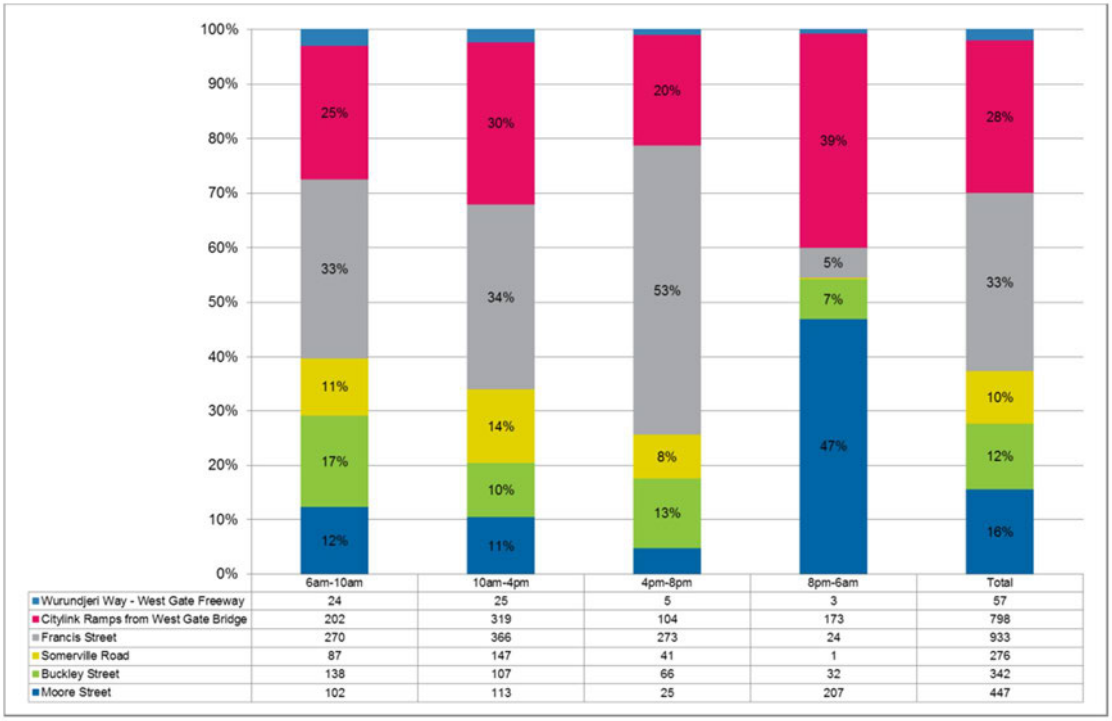


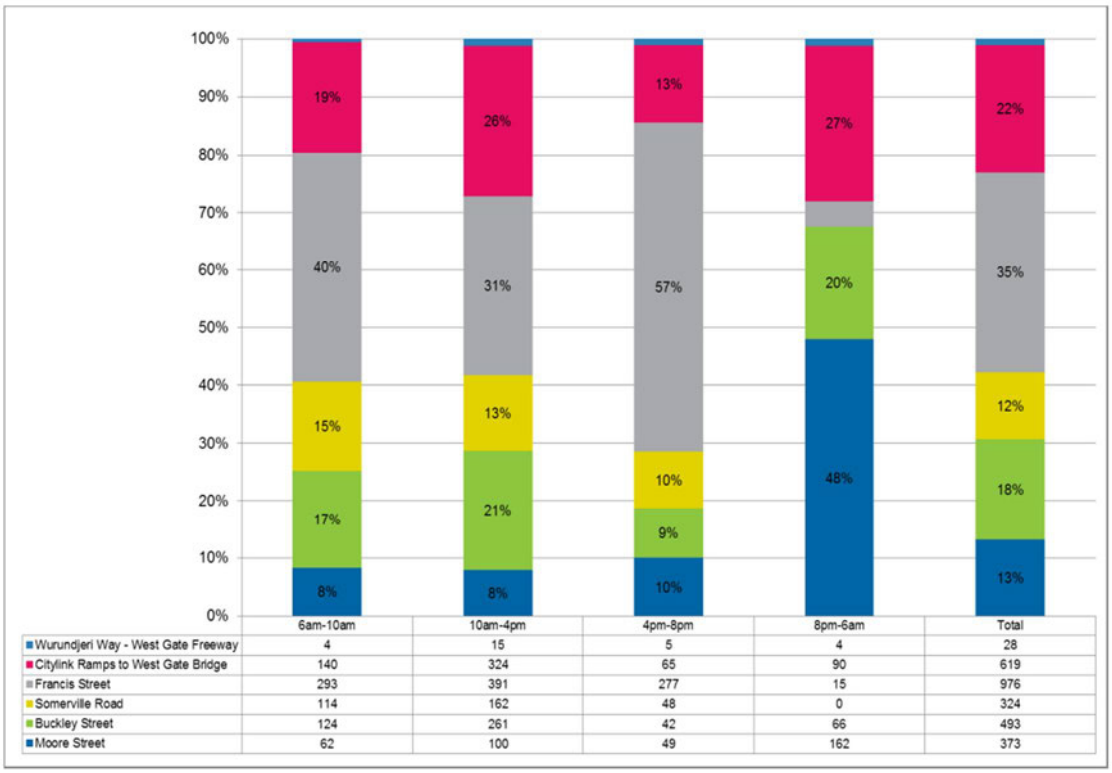
Figure 53 summarises the distribution of Swanson/Dynon Precinct truck trips from the west by time of day. Figure 54 summarises the distribution of Swanson/Dynon Precinct truck trips to the west by time of day. The trends are broadly similar in both directions with Francis Street and CityLink being the major roads used during non-curfew hours. During curfew periods (8pm to 6am) Moore Street and CityLink are the most commonly used roads.

Figure 53 Swanson/Dynon Precinct truck distribution from the west – by time of day



	6am-10am	10am-4pm	4pm-8pm	8pm-6am	Total
Wurundjeri Way - West Gate Freeway	24	25	5	3	57
Citylink Ramps from West Gate Bridge	202	319	104	173	798
Francis Street	270	366	273	24	933
Somerville Road	87	147	41	1	276
Buckley Street	138	107	66	32	342
Moore Street	102	113	25	207	447

Figure 54 Swanson/Dynon Precinct truck distribution to the west – by time of day



	6am-10am	10am-4pm	4pm-8pm	8pm-6am	Total
Wurundjeri Way - West Gate Freeway	4	15	5	4	28
Citylink Ramps to West Gate Bridge	140	324	65	90	619
Francis Street	293	391	277	15	976
Somerville Road	114	162	48	0	324
Buckley Street	124	261	42	66	493
Moore Street	62	100	49	162	373

Table 12 presents the proportion of Swanson and Dynon Precinct related trucks on local roads during daytime and curfew periods. It can be seen that:

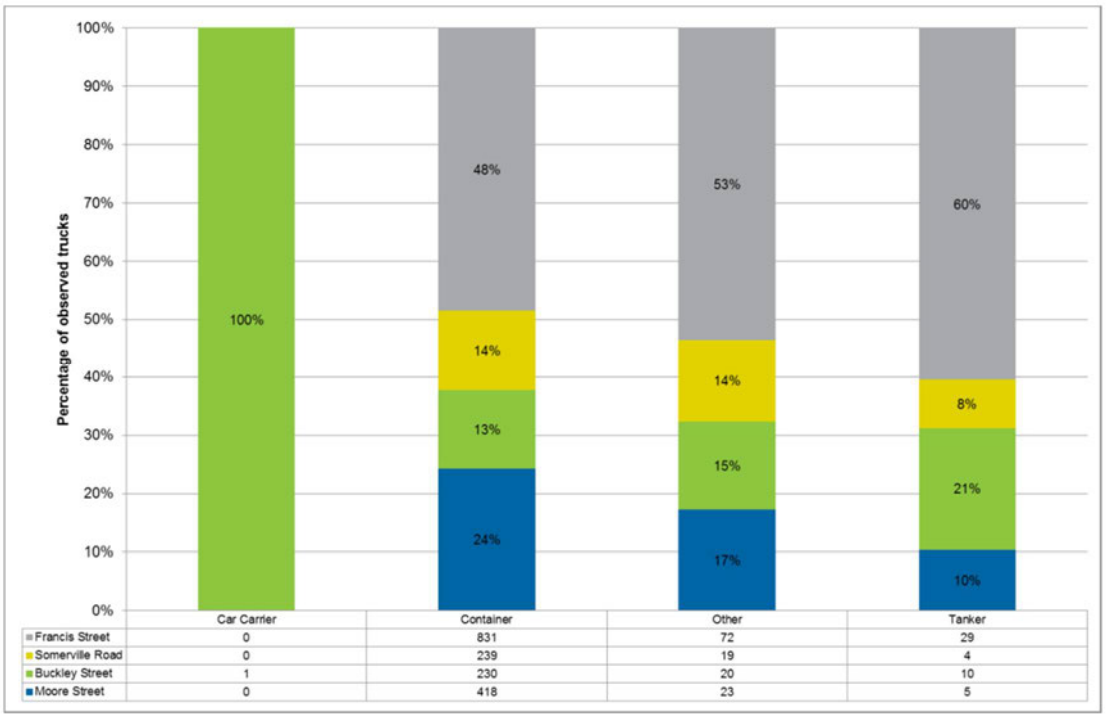
- During the daytime period, trucks that have an origin or destination within the Swanson/Dynon Precinct typically make up over half of all trucks on local arterial roads within the Inner West.
- During curfew periods the proportion of Swanson/Dynon related trucks reduces significantly on Francis Street and Somerville Road, however increases on Moore Street and Buckley Street (westbound).

Table 12 Existing Swanson/Dynon Precinct truck distribution to/from the west by total truck volumes on arterial road

Road	Percentage of total trucks that are Swanson/Dynon-related			
	Daytime (6am-8pm)		Night time (8pm-6am)	
	Inbound	Outbound	Inbound	Outbound
Francis Street	62% - 79%	48% – 62%	22%	20%
Somerville Road	45% - 51%	54% - 61%	13%	0%
Buckley Street	34% - 77%	53% - 57%	19%	63%
Moore Street	58% - 71%	50% - 58%	73%	64%

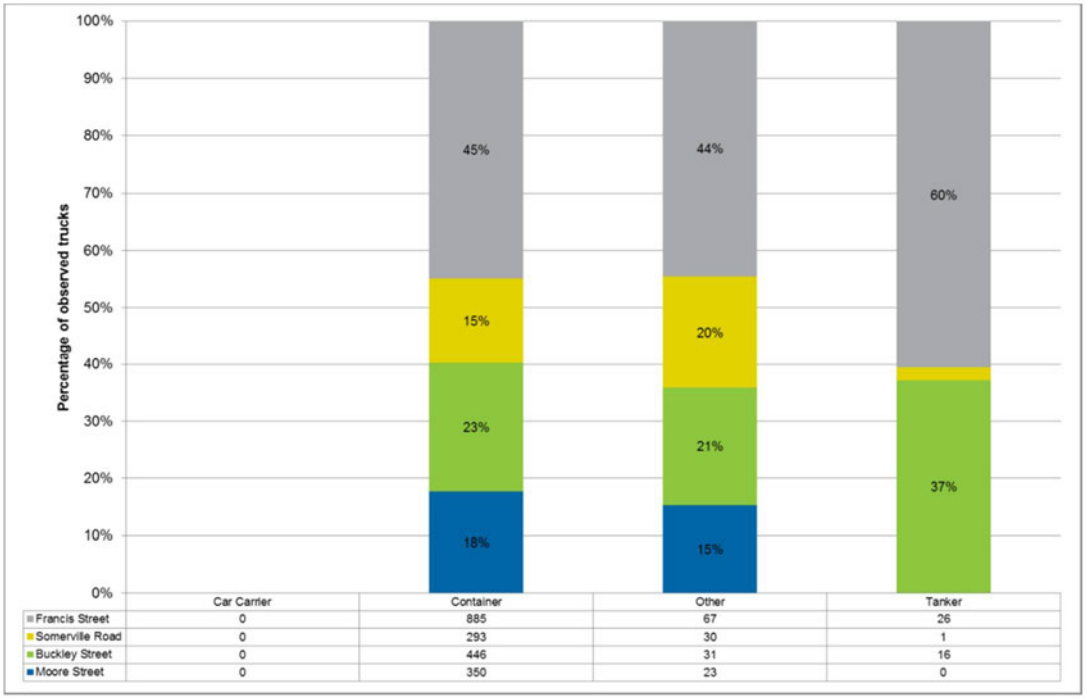
Figure 55 summarises the distribution of truck travelling to the Swanson/Dynon Precinct truck from the west by truck type. Figure 56 summarises the distribution of truck travelling from the Swanson/Dynon Precinct truck to the west by truck type.

Figure 55 Swanson/Dynon Precinct truck distribution from the west – by truck type



	Car Carrier	Container	Other	Tanker
Francis Street	0	831	72	29
Somerville Road	0	239	19	4
Buckley Street	1	230	20	10
Moore Street	0	418	23	5

Figure 56 Swanson/Dynon Precinct truck distribution to the west – by truck type



	Car Carrier	Container	Other	Tanker
Francis Street	0	885	67	26
Somerville Road	0	293	30	1
Buckley Street	0	446	31	16
Moore Street	0	350	23	0

4. Existing Truck Movements through the Inner West

This section sources data from the VicRoads Inner West Truck Surveys (2014) report.

24 Hour Traffic Counts

The charts on the following pages present the average two-way weekday hourly volumes at the key locations within the Inner West indicated in Figure 57. The data was collected in December 2013.

- Figure 58 summarises traffic volumes at the CityLink ramps, Footscray Road and Whitehall Street survey locations;
- Figure 59 summarises traffic volumes at the Hyde Street, Francis Street, Williamstown Road and Somerville Road survey locations; and
- Figure 60 summarises traffic volumes at the Buckley Street, Moore Street, and Geelong Road survey locations.

Figure 57 Inner West Traffic Survey Locations

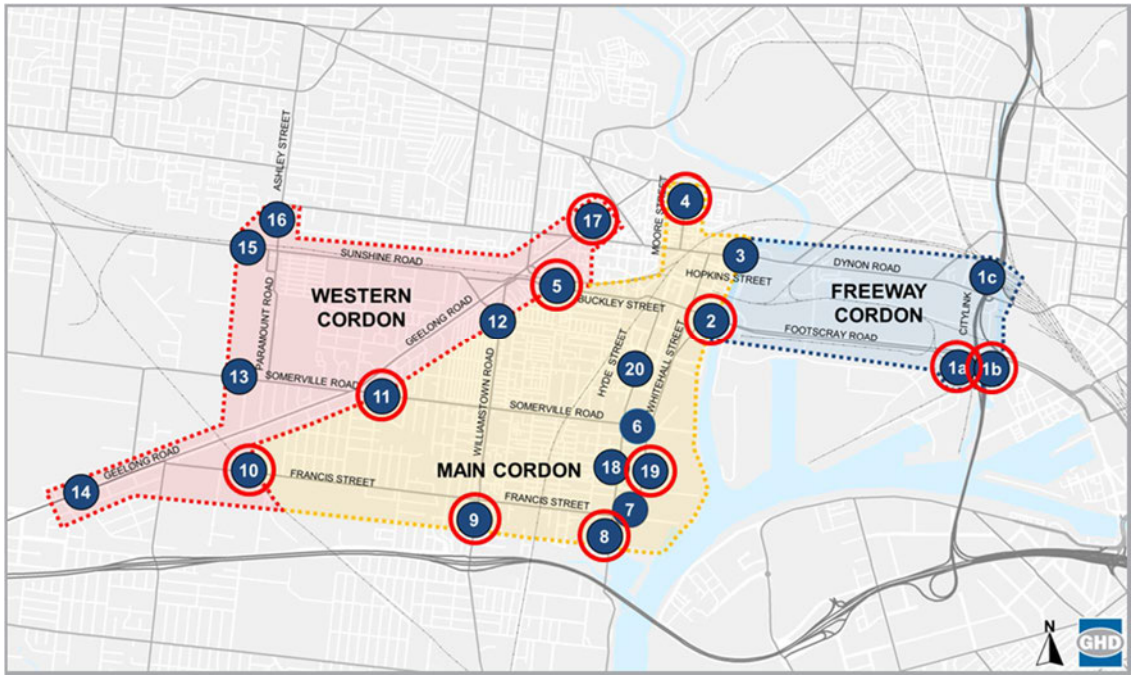
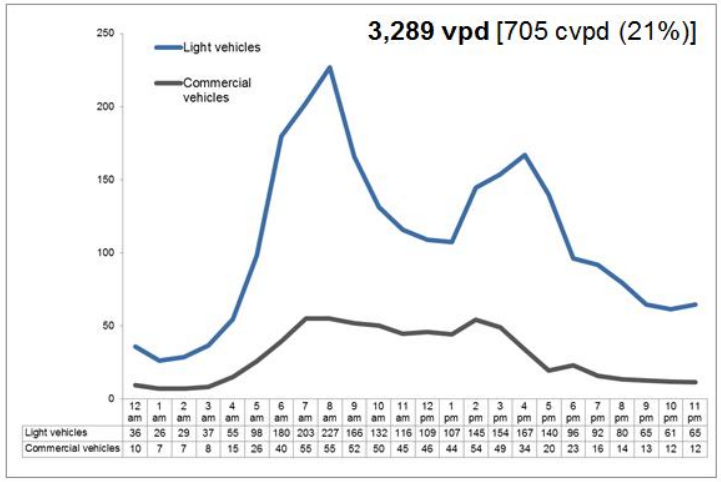


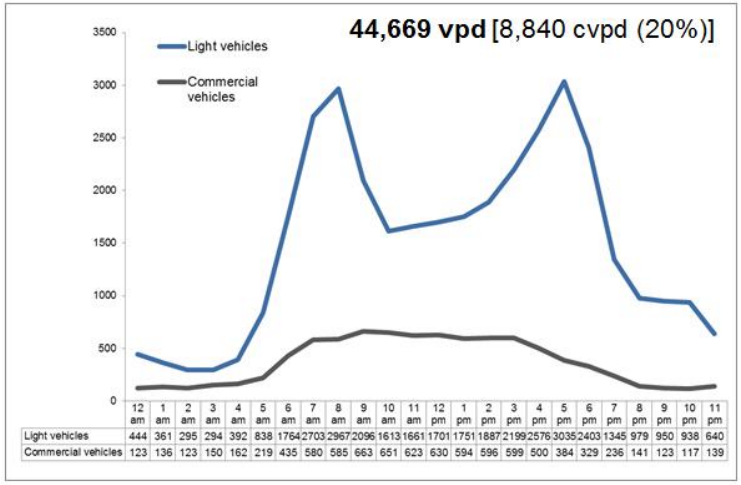
Figure 58 CityLink ramps, Footscray Road and Whitehall Street 24 Hour Traffic Volumes

CityLink northbound entry ramp, at Footscray Road



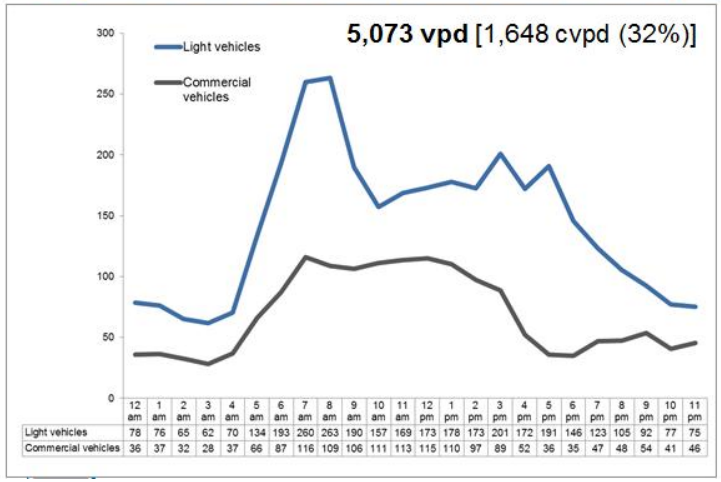
	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	36	26	29	37	55	98	180	203	227	166	132	116	109	107	145	154	167	140	96	92	80	65	61	65
Commercial vehicles	10	7	7	8	15	26	40	55	55	52	50	45	46	44	54	49	34	20	23	16	14	13	12	12

Footscray Road, at Shepherds Bridge



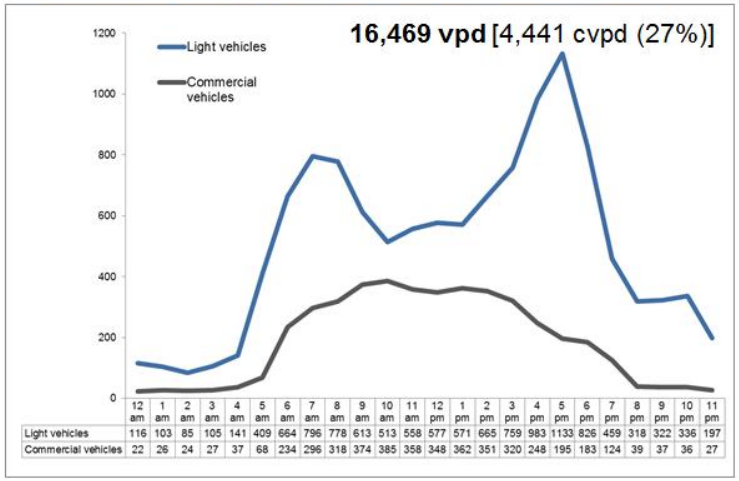
	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	444	361	295	294	392	838	1764	2703	2967	2096	1613	1661	1701	1751	1887	2199	2576	3035	2403	1345	979	950	938	640
Commercial vehicles	123	136	123	150	162	219	435	580	585	663	651	623	630	594	596	599	500	384	329	236	141	123	117	139

CityLink southbound entry ramp, at Footscray Road



	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	78	76	65	62	70	134	193	260	263	190	157	169	173	178	173	201	172	191	146	123	105	92	77	75
Commercial vehicles	36	37	32	28	37	66	87	116	109	106	111	113	115	110	97	89	52	36	35	47	48	54	41	46

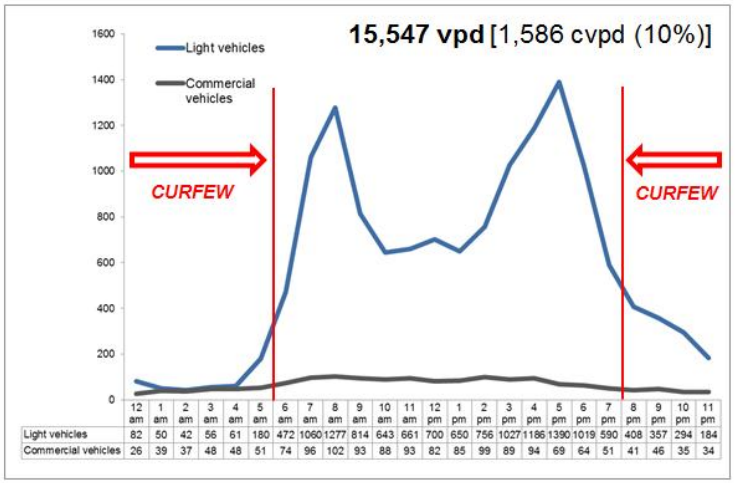
Whitehall Street, south of Somerville Road



	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	116	103	85	105	141	409	664	796	778	613	513	558	577	571	665	759	983	1133	826	459	318	322	336	197
Commercial vehicles	22	26	24	27	37	68	234	296	318	374	385	358	348	362	351	320	248	195	183	124	39	37	36	27

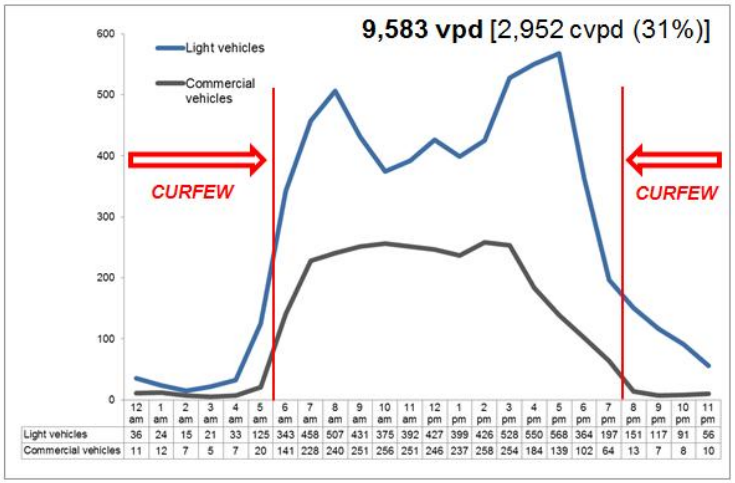
Figure 59 Hyde Street, Francis Street, Williamstown Road and Somerville Road 24 Hour Traffic Volumes

Hyde Street, south of Francis Street



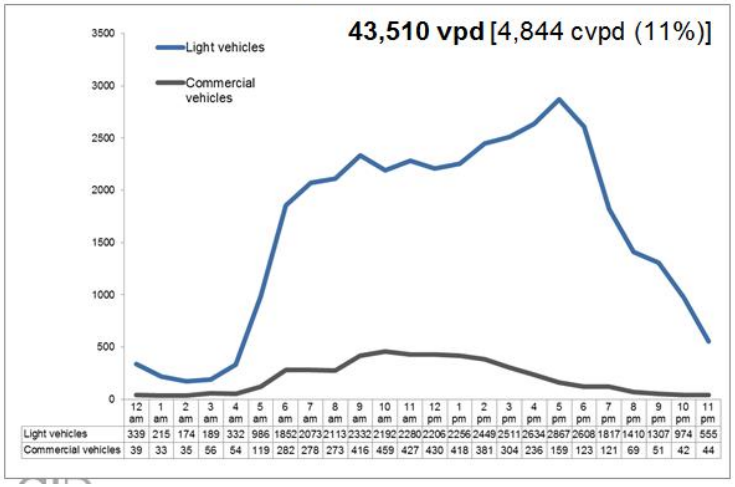
	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	82	50	42	56	61	180	472	1060	1277	814	643	661	700	650	756	1027	1186	1390	1019	590	408	357	294	184
Commercial vehicles	26	39	37	48	48	51	74	96	102	93	88	93	82	85	99	89	94	69	64	51	41	46	35	34

Francis Street, near Cemetery Road



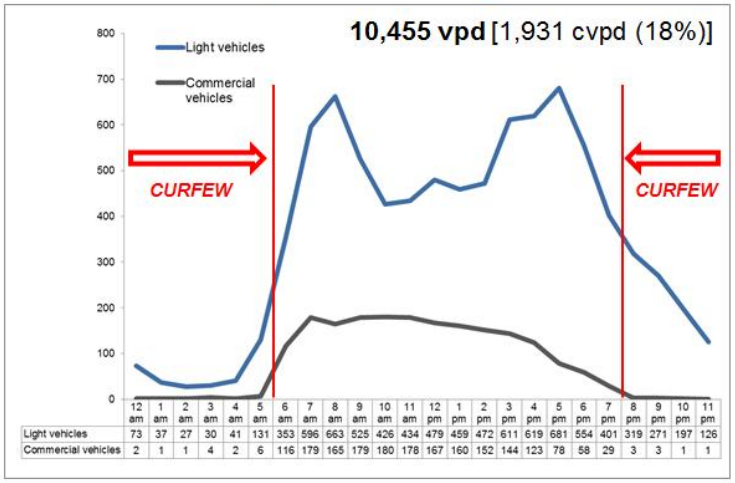
	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	36	24	15	21	33	125	343	458	507	431	375	392	427	399	426	528	550	568	364	197	151	117	91	56
Commercial vehicles	11	12	7	5	7	20	141	228	240	251	256	251	246	237	258	254	184	139	102	64	13	7	8	10

Williamstown Road, south of Francis Street



	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	339	215	174	189	332	986	1852	2073	2113	2332	2192	2280	2206	2256	2449	2511	2634	2867	2608	1817	1410	1307	974	555
Commercial vehicles	39	33	35	56	54	119	282	278	273	416	459	427	430	418	381	304	236	159	123	121	69	51	42	44

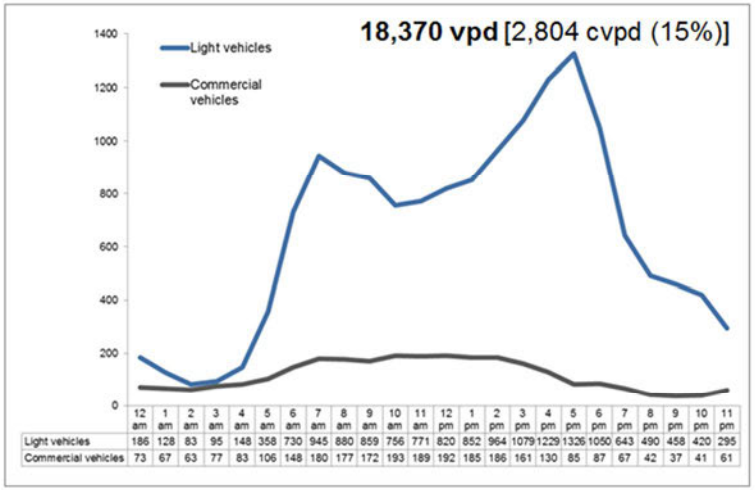
Somerville Road, east of Geelong Road



	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	73	37	27	30	41	131	353	596	663	525	426	434	479	459	472	611	619	681	554	401	319	271	197	126
Commercial vehicles	2	1	1	4	2	6	116	179	165	179	180	178	167	160	152	144	123	78	58	29	3	3	1	1

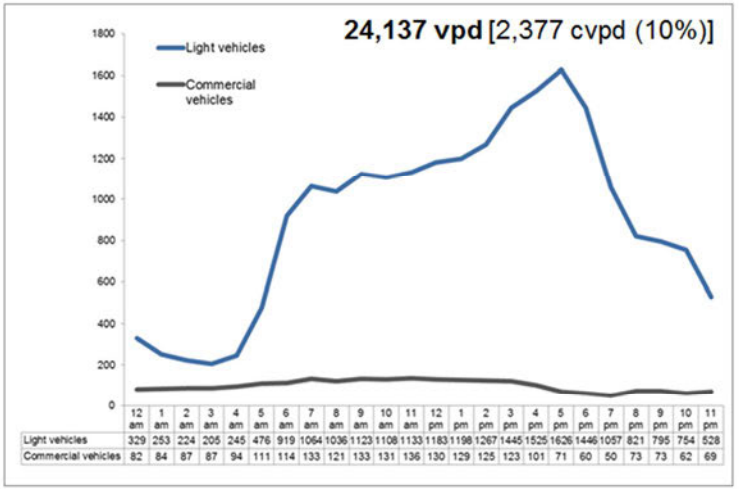
Figure 60 Buckley Street, Moore Street, and Geelong Road 24 Hour Traffic Volumes

Buckley Street, east of Geelong Road



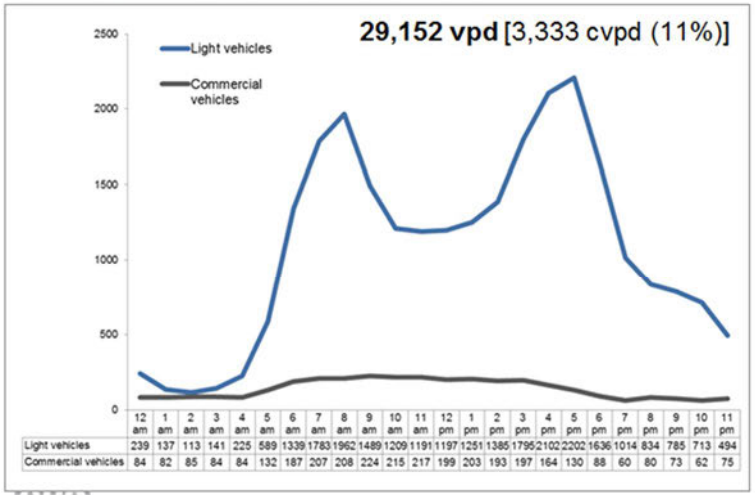
	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	186	128	83	95	148	358	730	945	880	859	756	771	820	852	964	1079	1229	1326	1050	643	490	458	420	295
Commercial vehicles	73	67	63	77	83	106	148	180	177	172	193	189	192	185	186	161	130	85	87	67	42	37	41	61

Moore Street, south of Ballarat Road



	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	329	253	224	205	245	476	919	1064	1036	1123	1108	1133	1183	1198	1267	1445	1525	1626	1446	1057	821	795	754	528
Commercial vehicles	82	84	87	87	94	111	114	133	121	133	131	136	130	129	125	123	101	71	60	50	73	73	62	69

Geelong Road, north of Barkly Street



	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Light vehicles	239	137	113	141	225	589	1339	1783	1962	1489	1209	1191	1197	1251	1385	1795	2102	2202	1636	1014	834	785	713	494
Commercial vehicles	84	82	85	84	84	132	187	207	208	224	215	217	199	203	193	197	164	130	88	60	80	73	62	75

Overall Traffic Volumes

The maps on the following pages present the volume of trucks recorded in December 2013 travelling within the Inner West, by proportion of total volume.

- Figure 61 summarises overall traffic volumes within the Main Cordon (Footscray and Yarraville precinct);
- Figure 62 summarises overall traffic volumes within the Freeway Cordon (locations in the vicinity of Footscray Road and Dynon Road); and
- Figure 63 summarises overall traffic volumes within the Western Cordon (locations in, and leading to, the Tottenham precinct).

Figure 61 Main Cordon Overall Traffic Volumes (24 Hours)

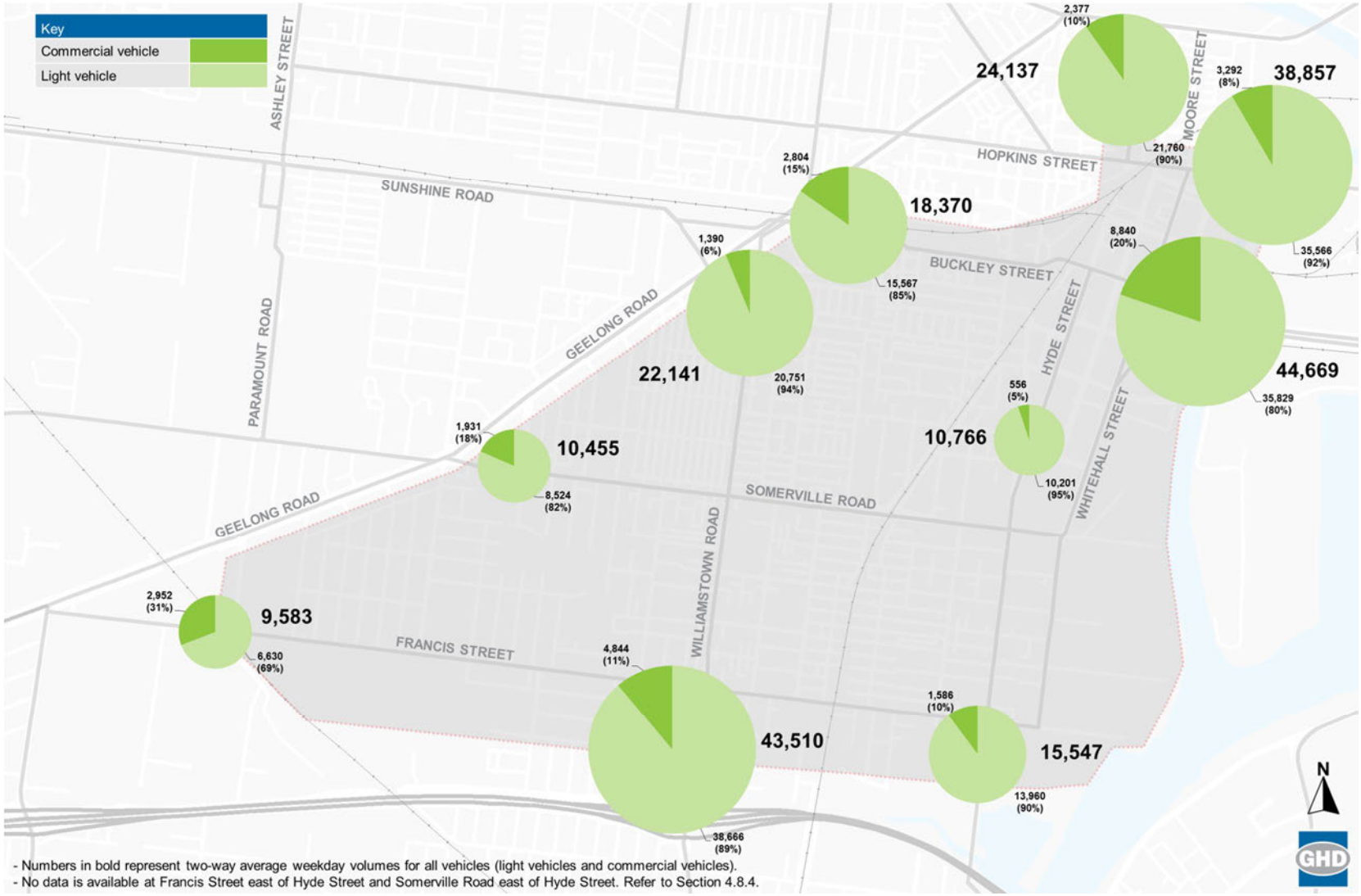


Figure 62 Freeway Cordon Overall Traffic Volumes (24 Hours)

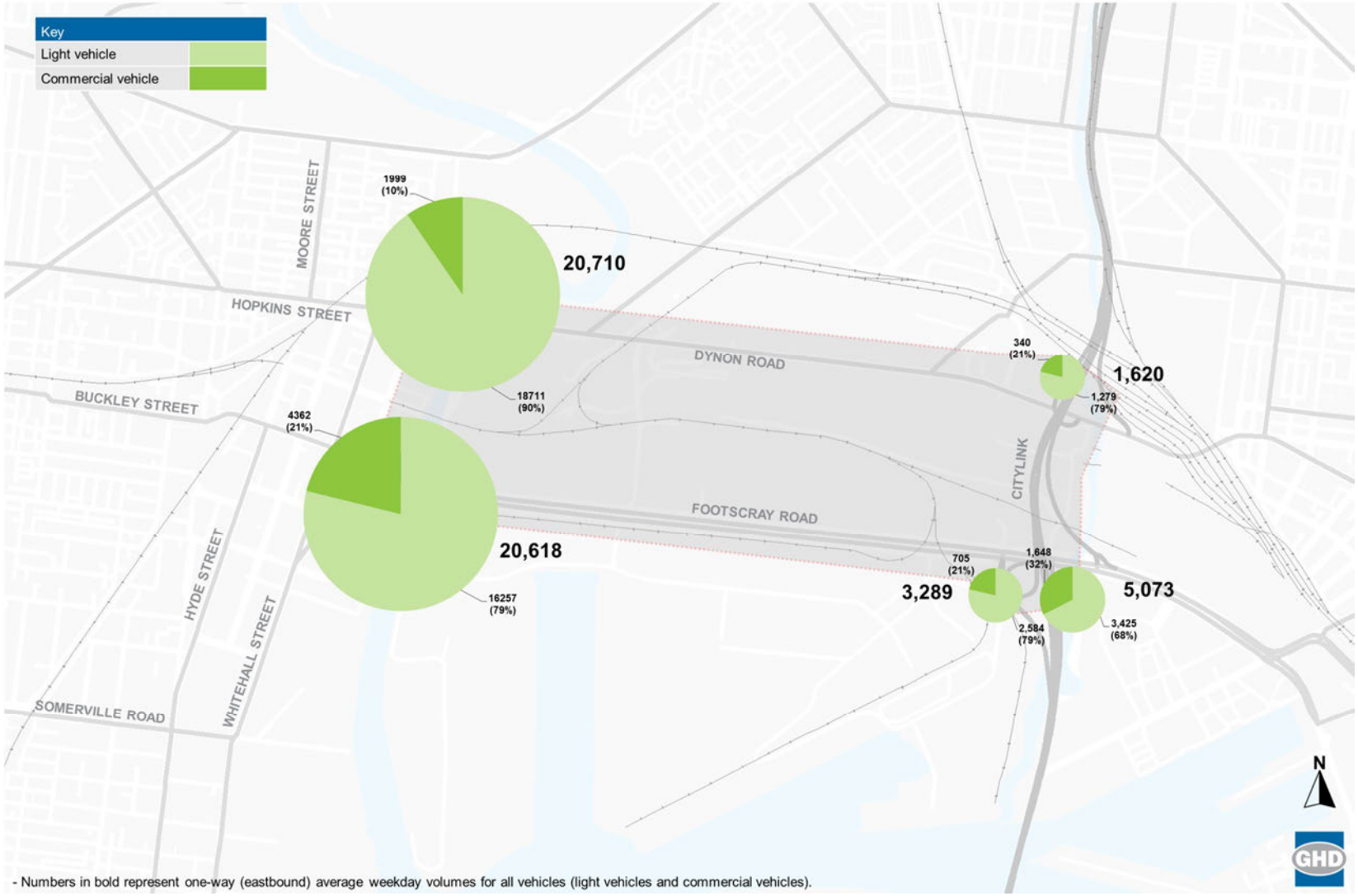
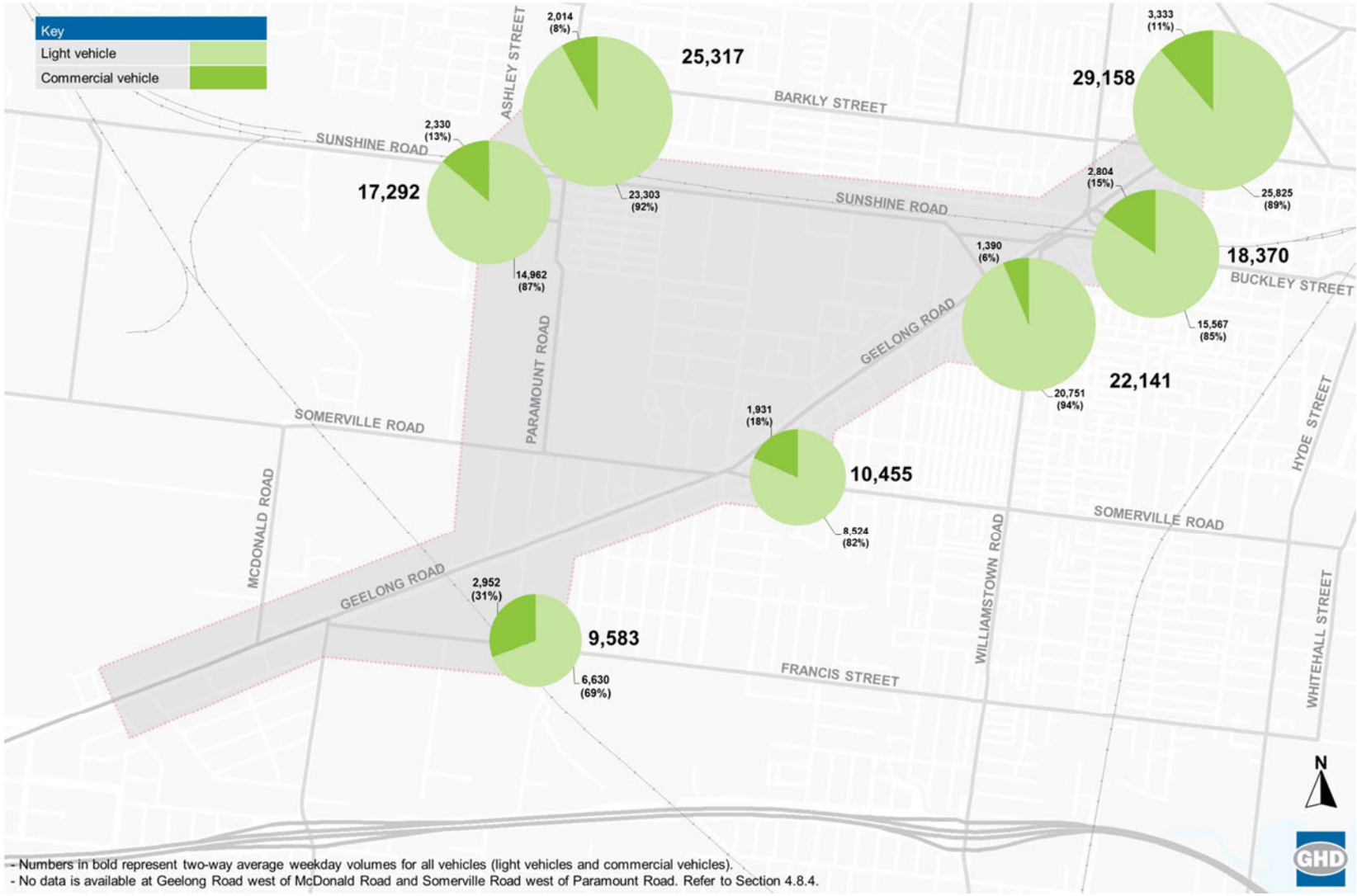


Figure 63 Western Cordon Overall Traffic Volumes (24 Hours)



Truck volume – by truck size

The following maps summarise the volume of trucks observed by truck size (grouped into rigid, semi- trailer and B-Double trucks). Please note that at the time of the surveys there were no truck curfews on Moore Street and there was no school time truck curfew on Somerville Road.

- Figure 64 summarises truck sizes within the Main Cordon (Footscray and Yarraville precinct);
- Figure 65 summarises truck sizes within the Freeway Cordon (locations in the vicinity of Footscray Road and Dynon Road; and
- Figure 66 summarises truck sizes within the Western Cordon (locations in, and leading to, the Tottenham precinct).

Figure 64 Main Cordon Truck Volumes by Size (24 Hours)

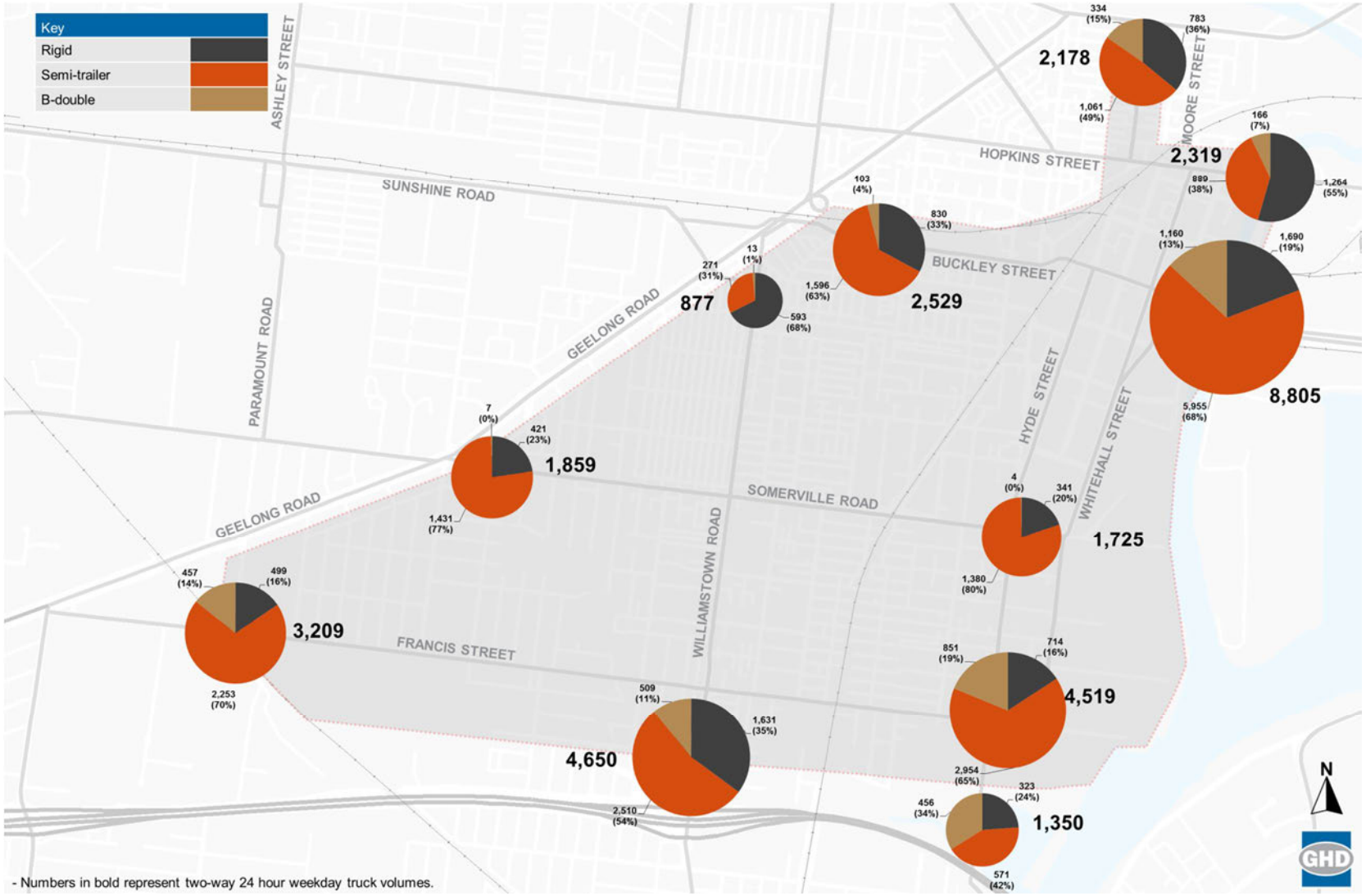


Figure 65 Freeway Cordon Truck Volumes by Size (24 Hours)

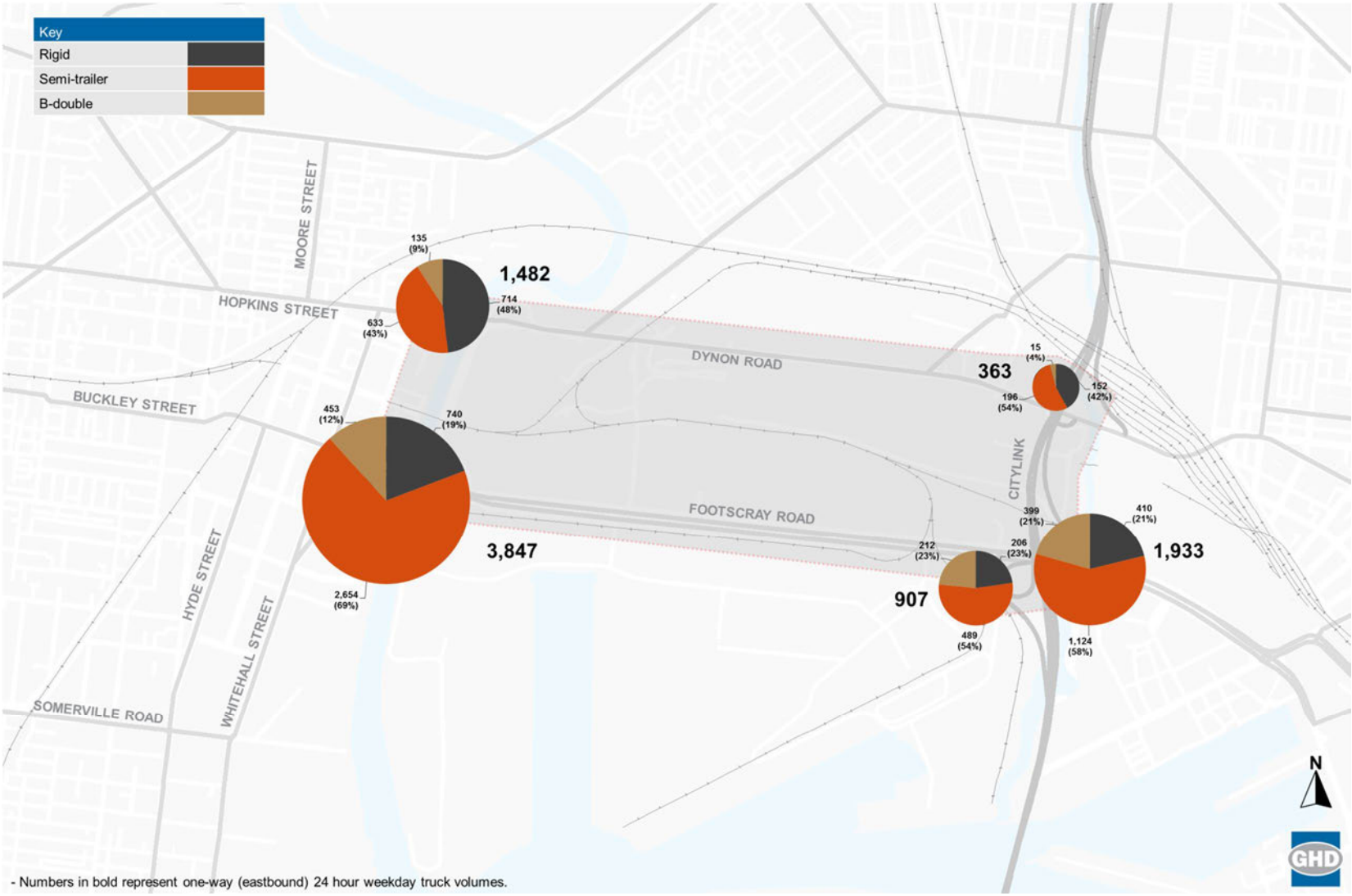
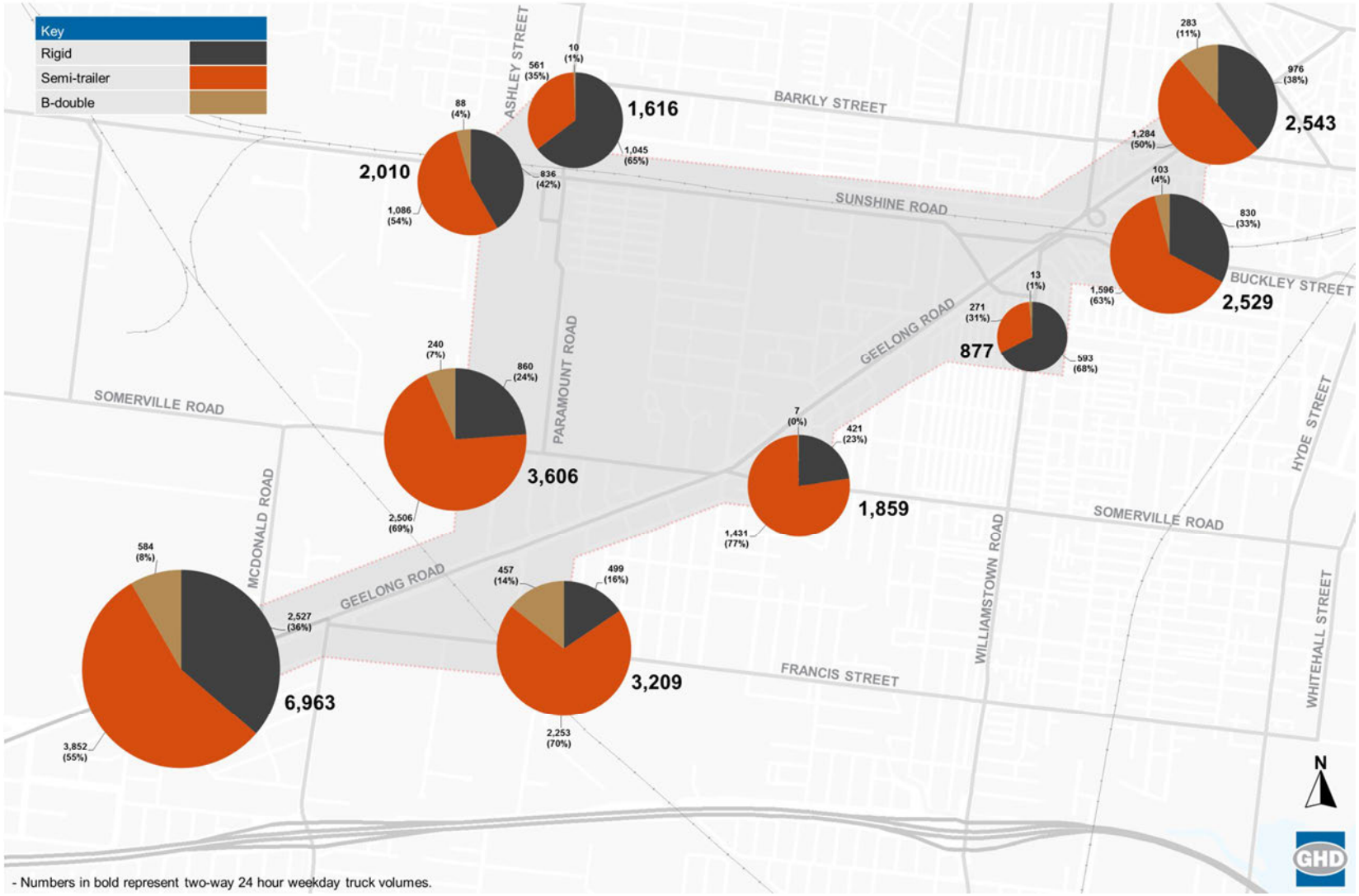


Figure 66 Western Cordon Truck Volumes by Size (24 Hours)



Truck Volumes by load type carried

The images on the following pages present the volume of trucks recorded in December 2013 travelling within the Inner West, by load carried. The charts also present the volumes (by load carried) during non-curfew and curfew periods.

Please note that at the time of the surveys there were no truck curfews on Moore Street and there was no school time truck curfew on Somerville Road.

The Main Cordon results are shown as follows:

- Figure 67 presents 24 hour truck volumes;
- Figure 68 presents non-curfew volumes (6am to 8pm); and
- Figure 69 presents curfew volumes (8pm to 6am).

The Freeway Cordon results are shown as follows:

- Figure 70 presents 24 hour truck volumes;
- Figure 71 presents non-curfew volumes (6am to 8pm); and
- Figure 72 presents curfew volumes (8pm to 6am).

The Western Cordon results are shown as follows:

- Figure 73 presents 24 hour truck volumes;
- Figure 74 presents non-curfew volumes (6am to 8pm); and
- Figure 75 presents curfew volumes (8pm to 6am).

As depicted in Figure 68 and Figure 69, there is a significant reduction in the proportion of container trucks that use Williamstown Road, Francis Street, Somerville Road, and Whitehall Street during the curfew periods. During curfew periods, the proportion of tanker trucks (as a proportion of total truck volume) increases, which is a logical outcome given the presence of existing fuel terminals in Francis Street and Hyde Street.

In contrast, during the curfew periods, the proportion of container trucks that travel via Moore Street increase significantly.

In summary, these results indicate that there is generally a high level of compliance to the existing truck curfews. Through trucks that can no longer travel via Francis Street or Somerville Road are choosing to travel via Moore Street.

It is unknown how many trucks may have alternatively chosen to travel via the West Gate Freeway (e.g. via Millers Road) during curfew periods.

Figure 67 Main Cordon Truck Volumes by Load Carried – 24 Hours

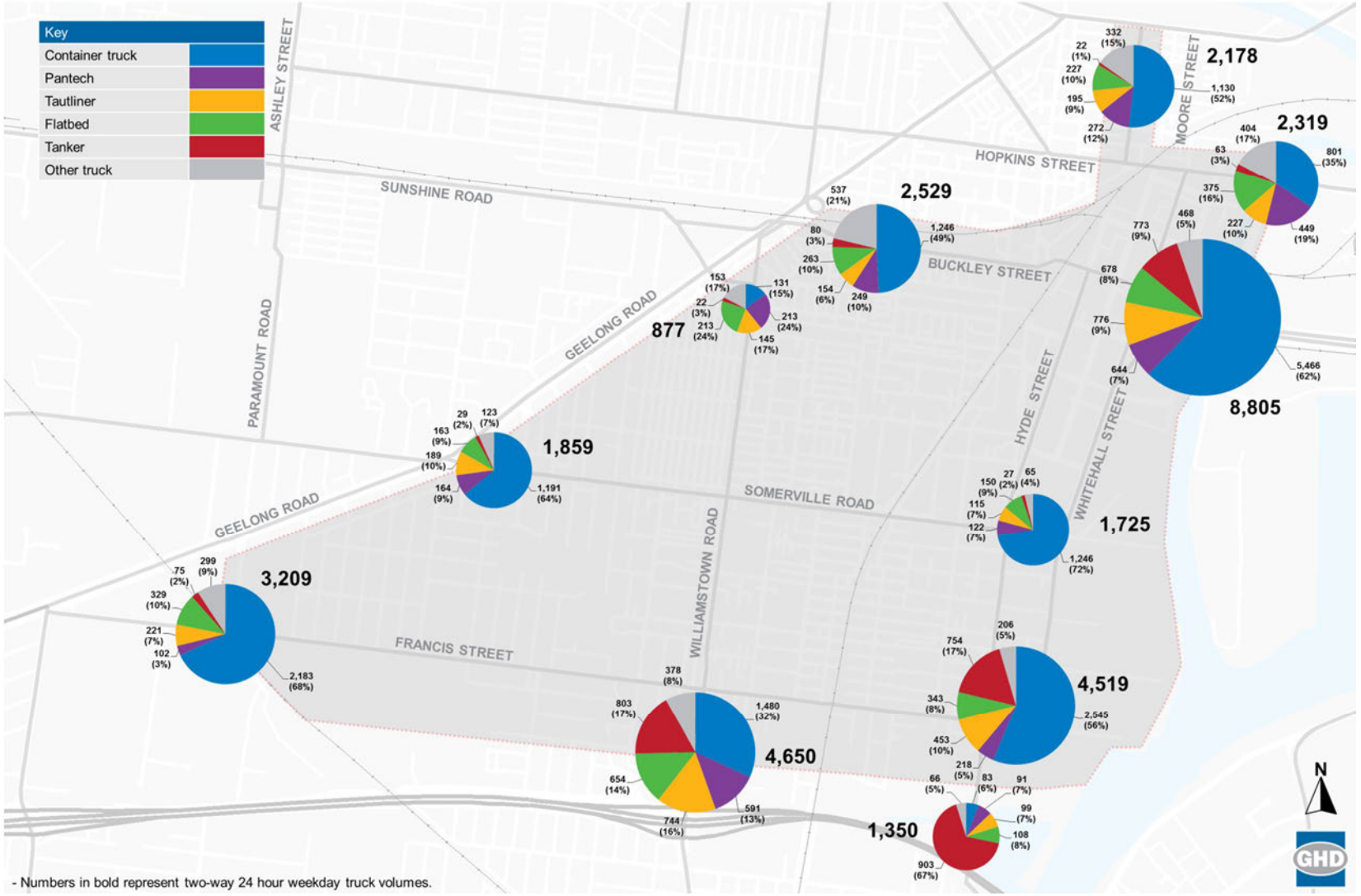


Figure 68 Main Cordon Truck Volumes by Load Carried – Non Curfew Period (6am-8pm)

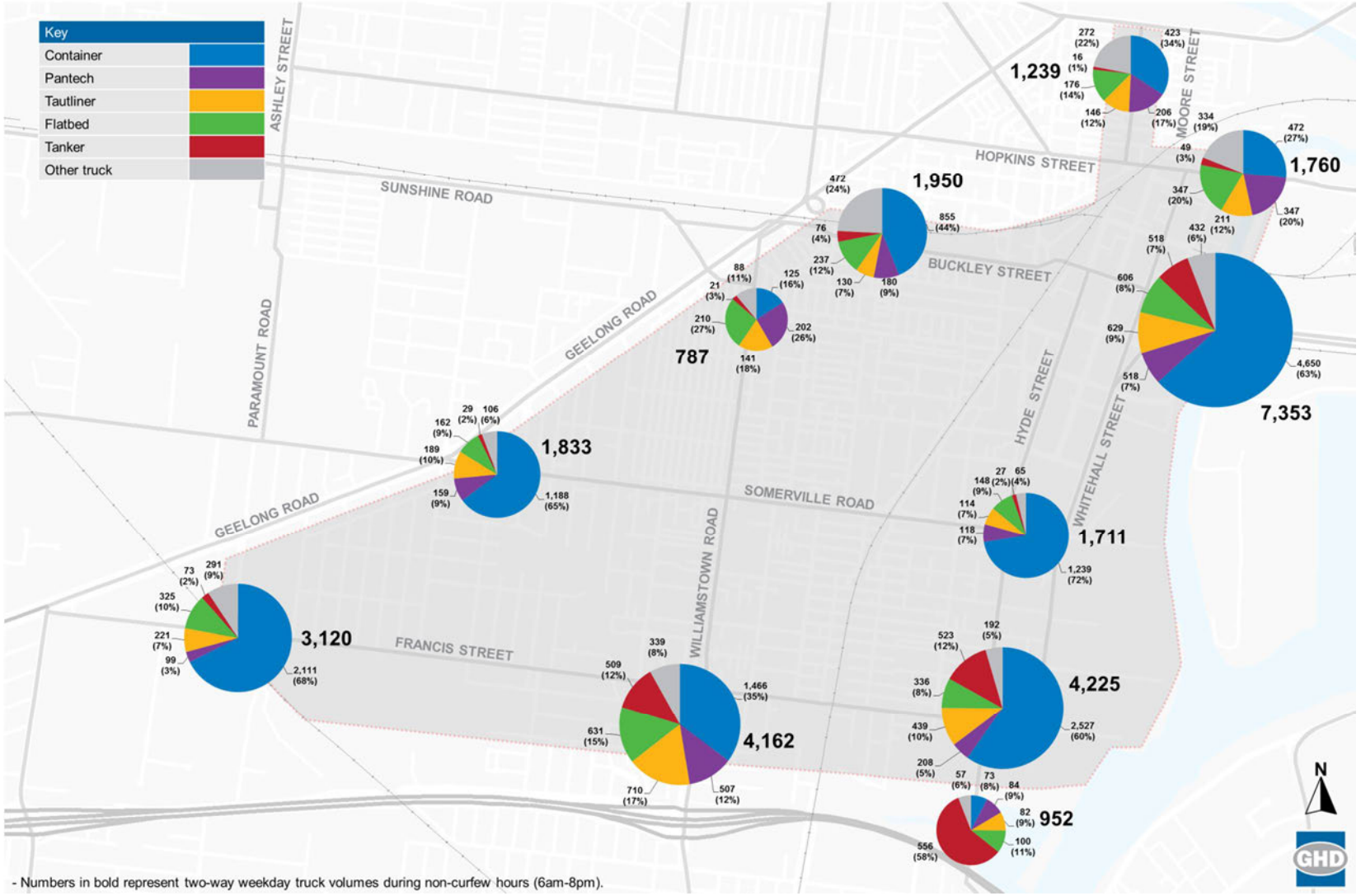


Figure 69 Main Cordon Truck Volumes by Load Carried – Curfew Period (8pm-6am)

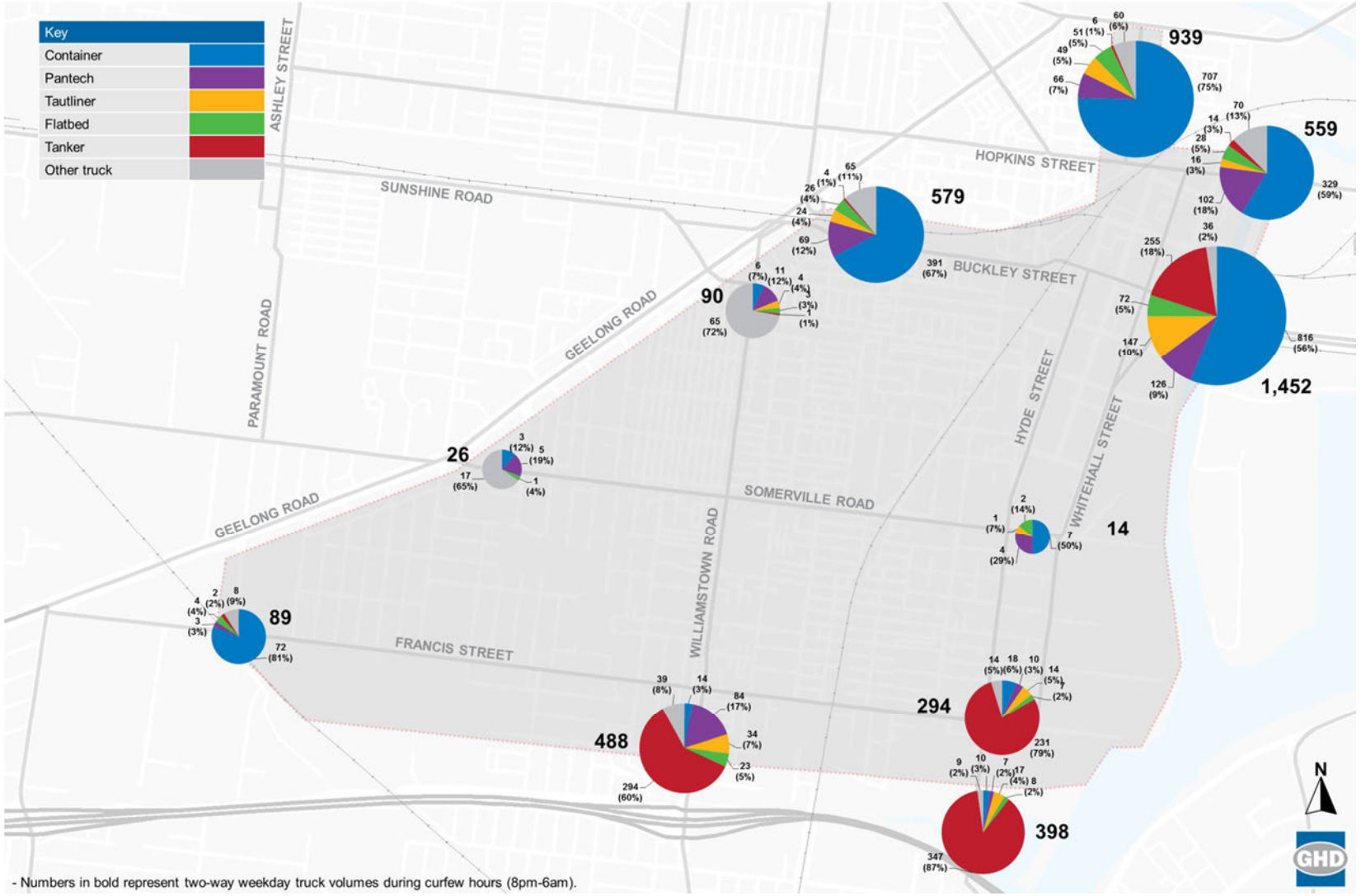


Figure 70 Freeway Cordon Truck Volumes by Load Carried – 24 Hours

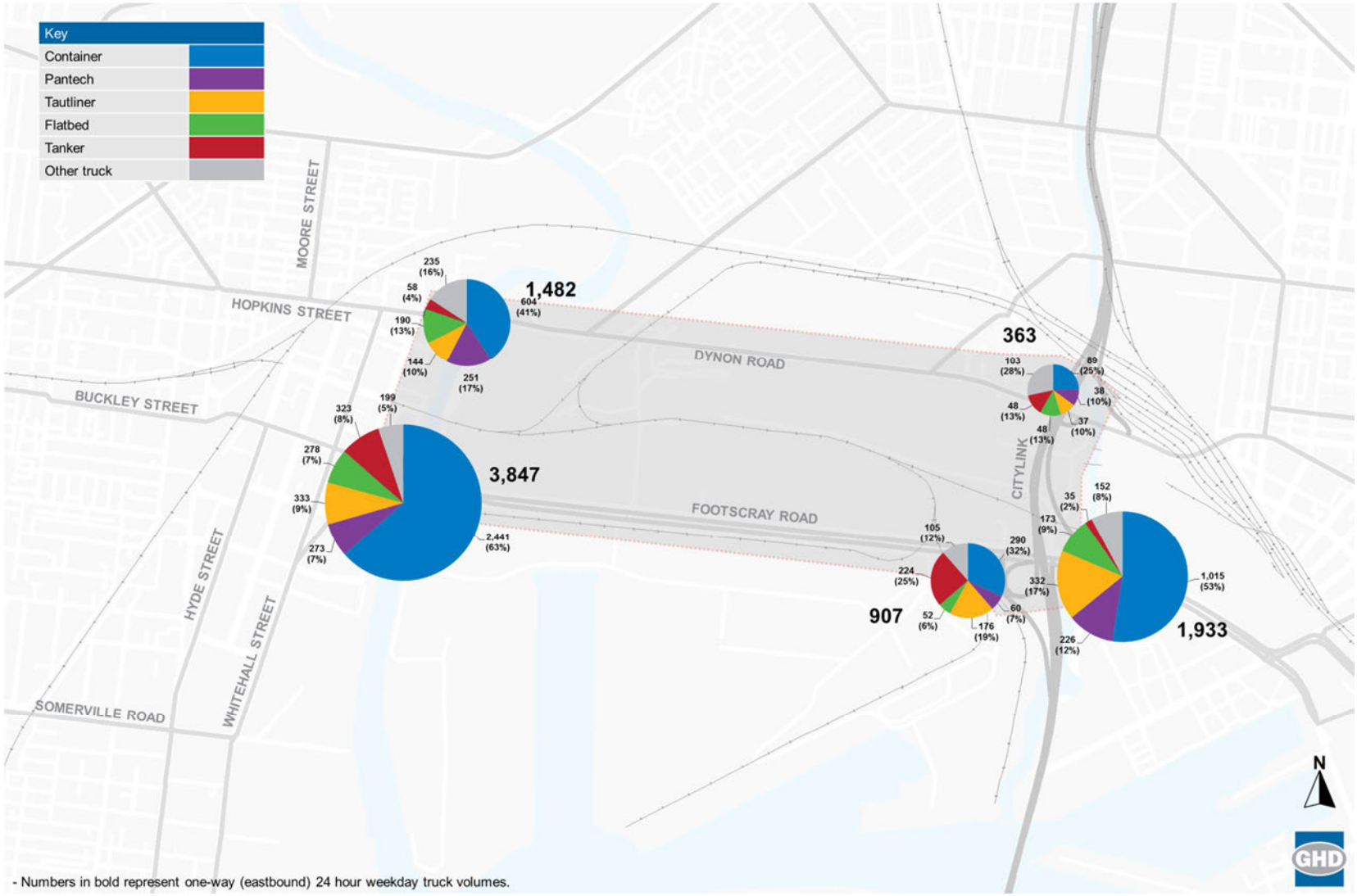


Figure 71 Freeway Cordon Truck Volumes by Load Carried – Non Curfew Period (6am-8pm)

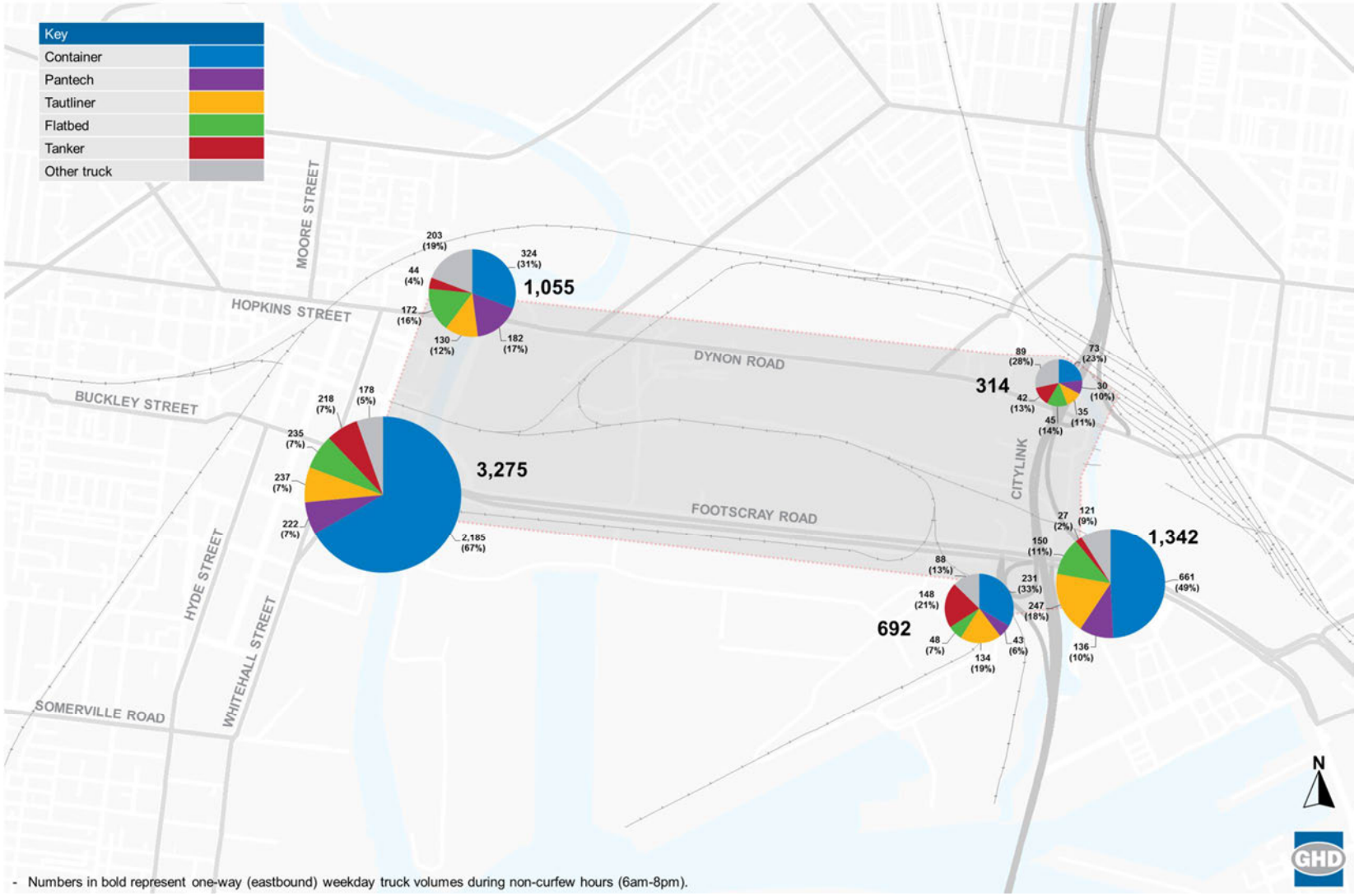


Figure 72 Freeway Cordon Truck Volumes by Load Carried – Curfew Period (8pm-6am)

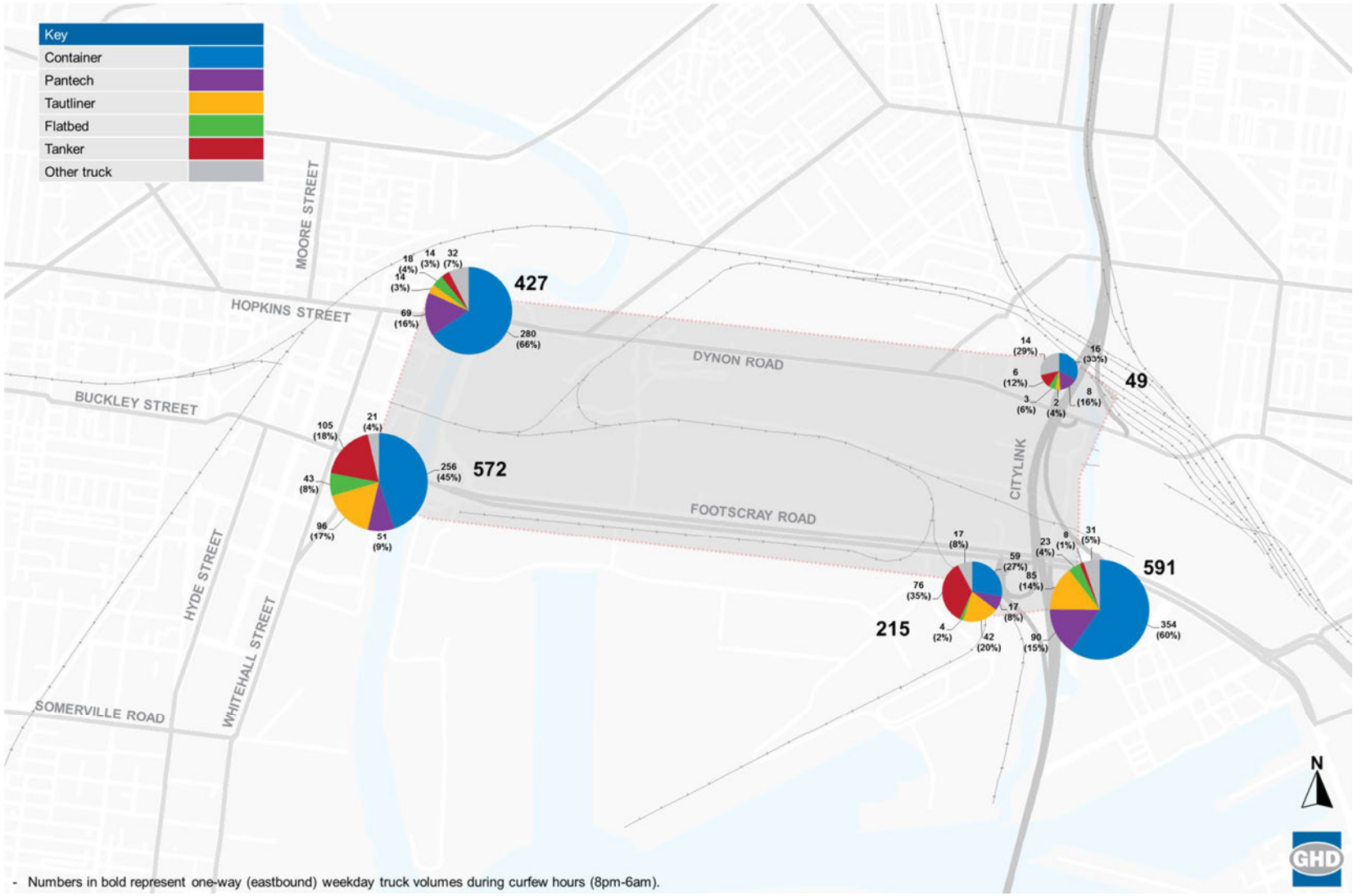


Figure 73 Western Cordon Truck Volumes by Load Carried – 24 Hours

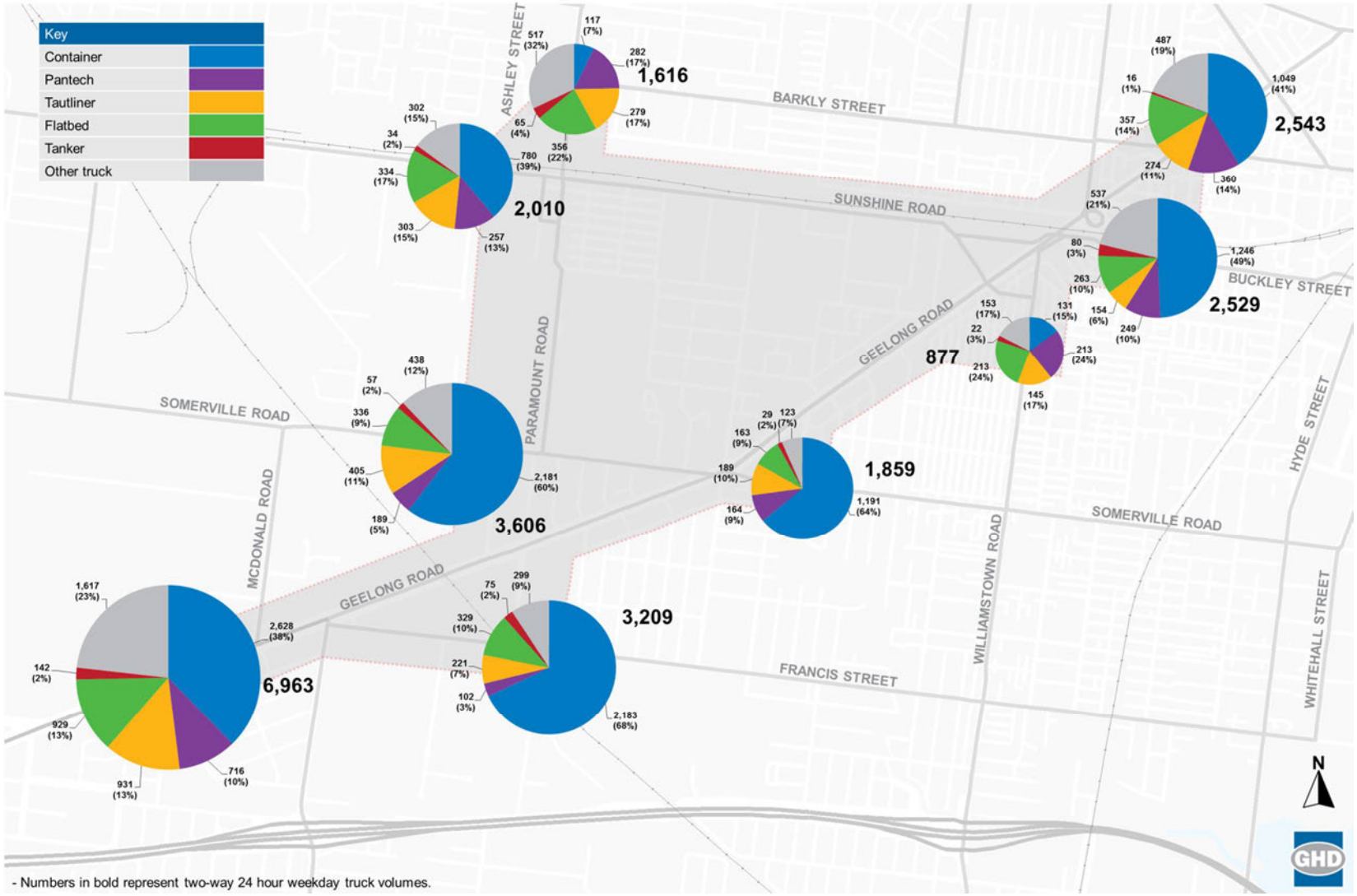


Figure 74 Western Cordon Truck Volumes by Load Carried – Non Curfew Period (6am-8pm)

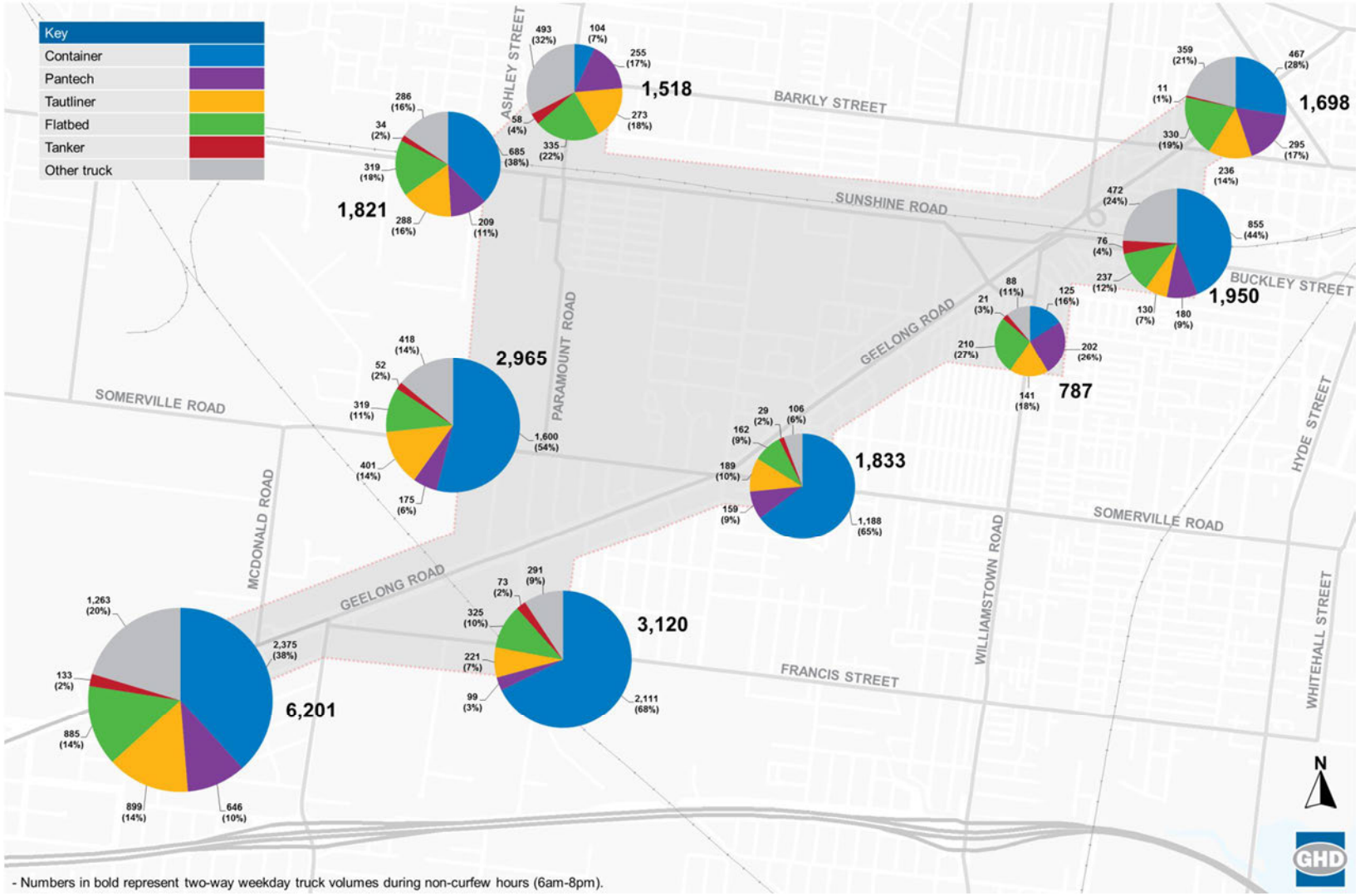
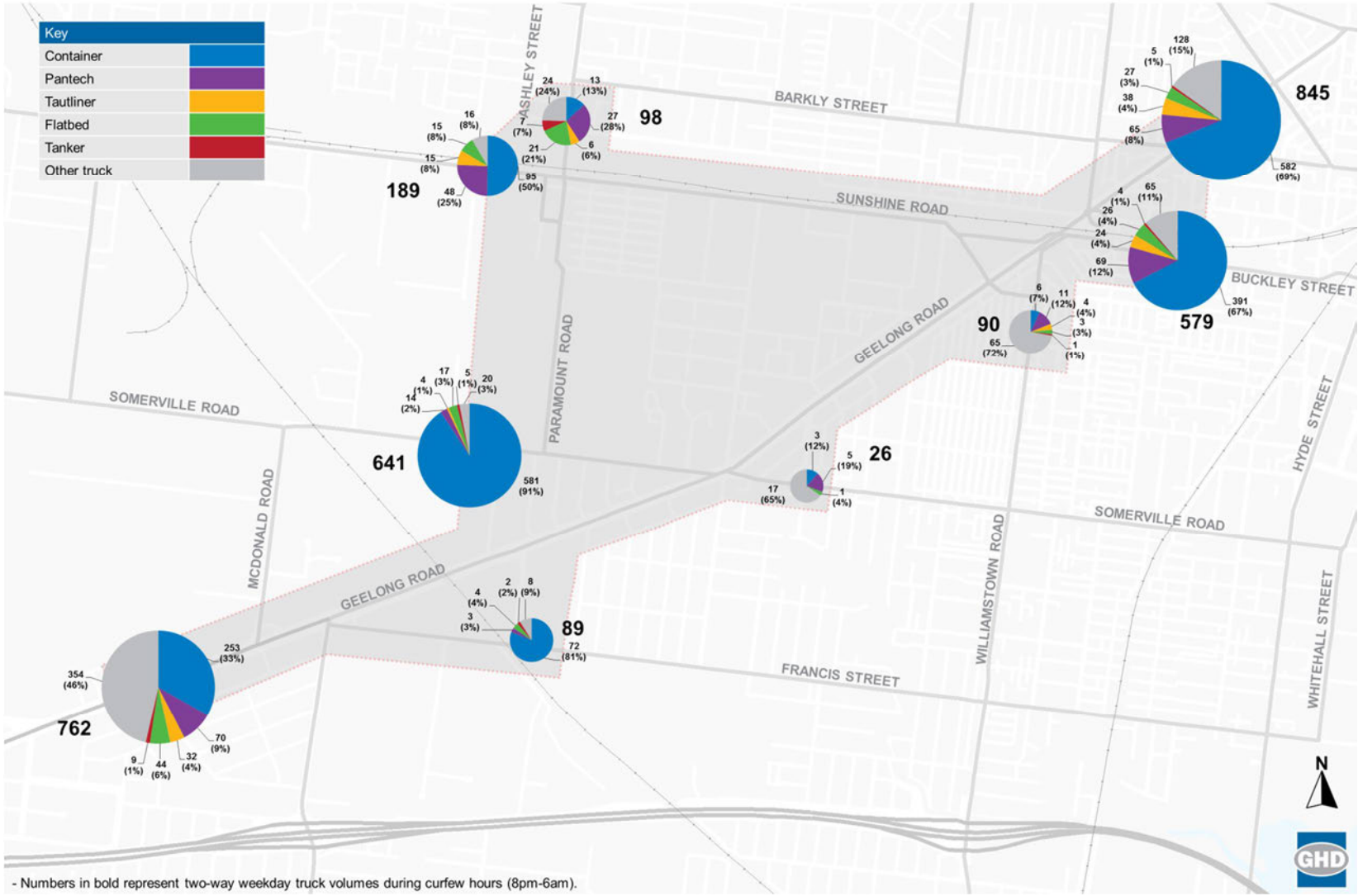


Figure 75 Western Cordon Truck Volumes by Load Carried – Curfew Period (8pm-6am)



Existing Through Trips (24 Hours)

Figure 76 and Figure 77 present the proportion of trucks recorded in December 2013 travelling within the Inner West in the Main Cordon and Western Cordon, that are regarded as either a through trip, precinct trip or undetermined trip. These are defined as follows:

- A “through trip” were trucks that were observed at two points within 30 minutes of each observation. These trips were unlikely to have a local destination.
- “Precinct trips” were trucks that were observed at two points at least 30 minutes apart. These trips were likely to have a purpose of stopping at a land use within the precinct.
- “Undetermined trips” were those where only one observation of a truck was made during the survey period. Whilst some of these may have been trucks that entered/left the cordon via a road that was not surveyed, more likely these were trips that had an origin or destination within the precinct.

The results reveal that approximately half of all trips through the Inner West were observed to be “through” trips. However, it is acknowledged that a proportion of these trips were likely to have previously visited a land use within the Western Cordon prior to entering the Inner West (i.e. east of Geelong Road).

Figure 76 Main Cordon Through Truck Trips (24 Hours)

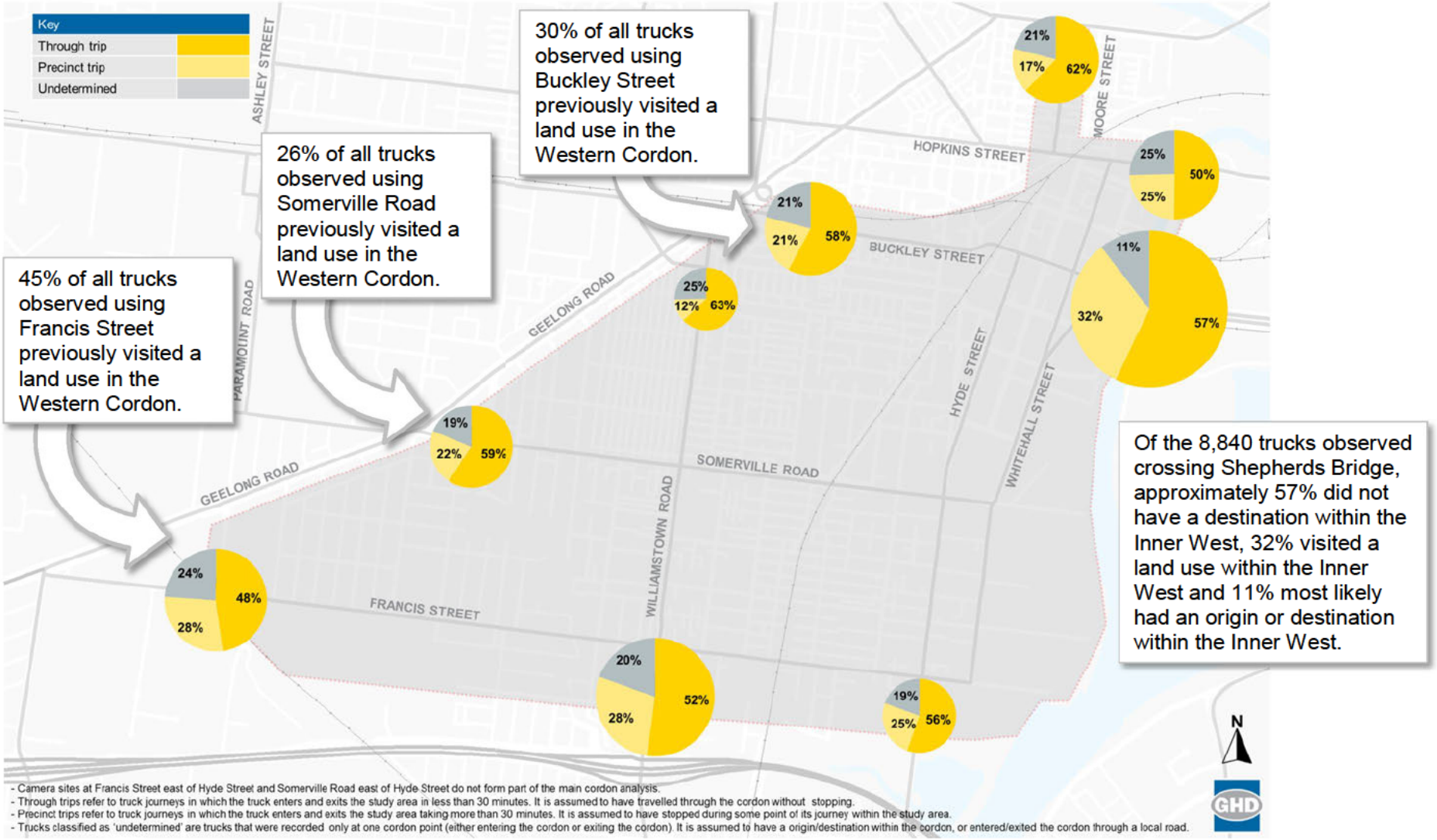


Figure 77 Western Cordon Through Truck Trips (24 Hours)

Truck movements across the Inner West

An estimate has been made of wider truck movements through the Yarraville area between the Maribyrnong River crossings to:

- Williamstown Road;
- Millers Road; and
- Geelong Road, Brooklyn.

This analysis is for all trucks irrespective of time taken to complete a journey.

Figure 78 summarises eastbound movements to the Maribyrnong River screenline. It can be seen that of the 5,329 trucks travelling eastbound on Dynon Road bridge and Shepherd Bridge 1,588 originated from either Williamstown Road, Millers Road or Geelong Road; and

Figure 79 summarises westbound movements from the Maribyrnong River screenline. It can be seen that of the 5,795 trucks travelling eastbound on Dynon Road bridge and Shepherd Bridge 1,763 originated from either Williamstown Road, Millers Road or Geelong Road.

Figure 78 Eastbound truck movements to the Maribyrnong River screenline (24 hours)

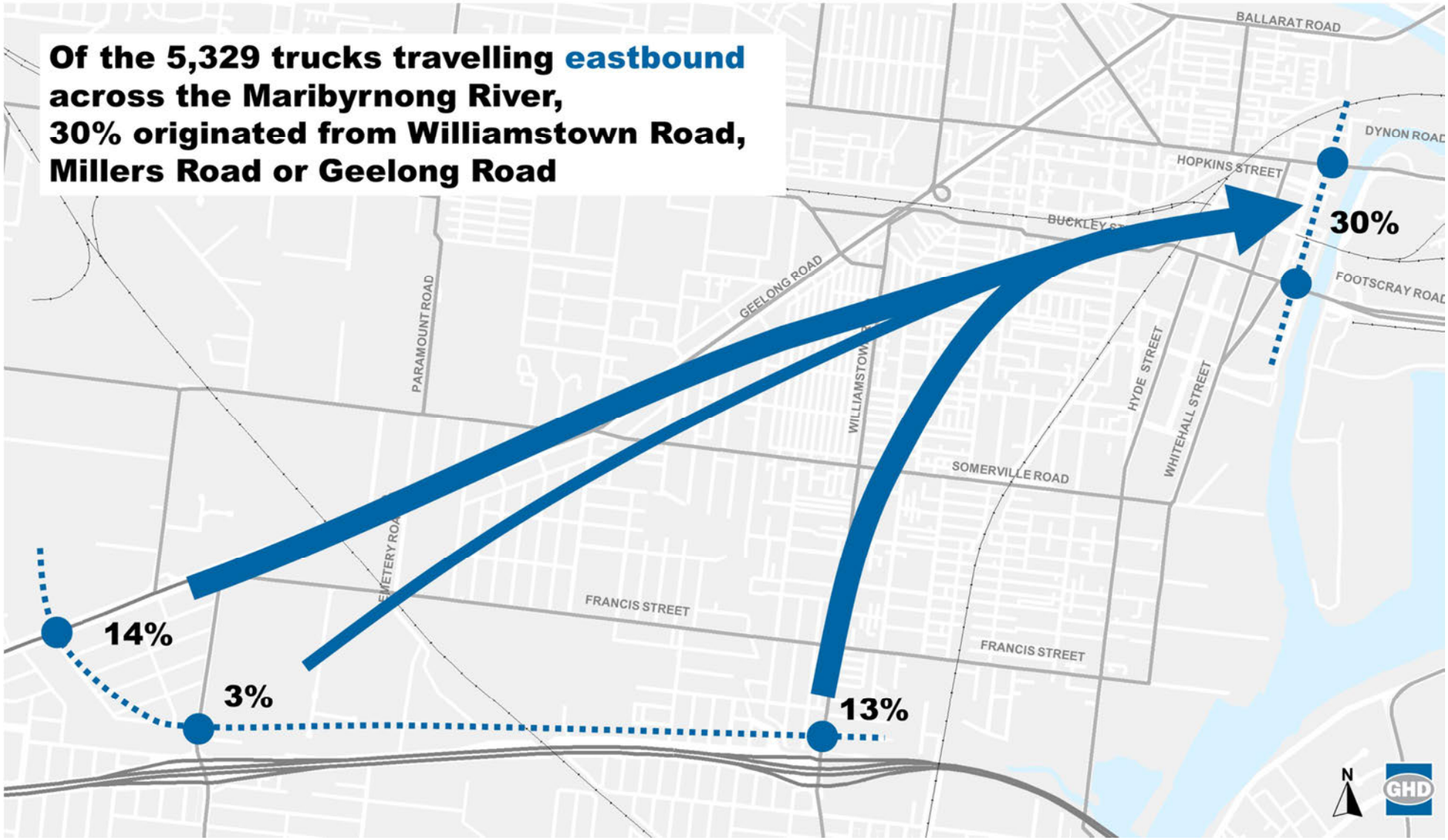
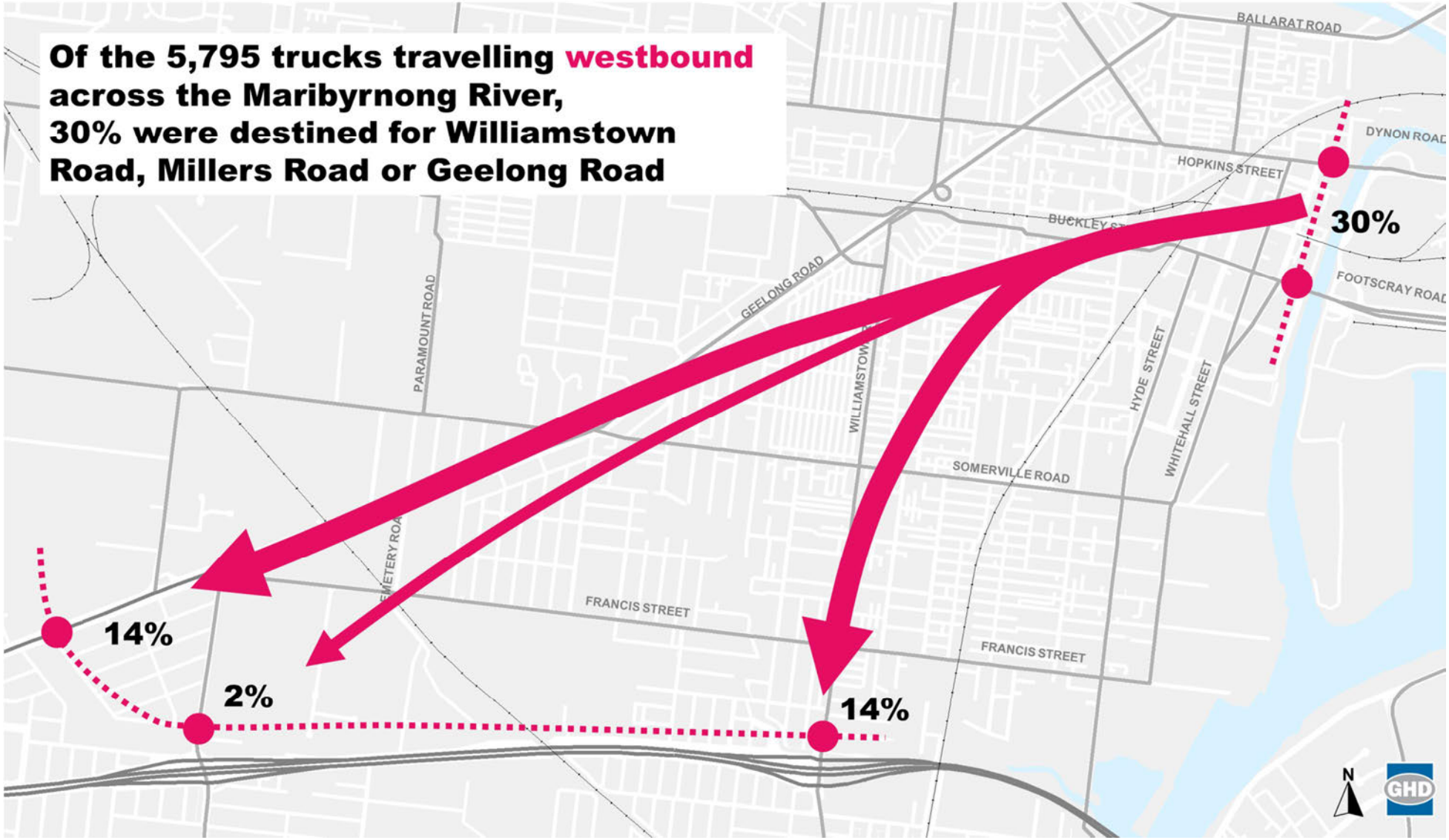


Figure 79 Westbound truck movements from the Maribyrnong River screenline (24 hours)



5. Existing Desire Lines

Likely desire lines based on the existing road configuration are discussed in this section and shown in Figure 80 to Figure 83. The desire lines represent the likely route travelled by freight vehicles.

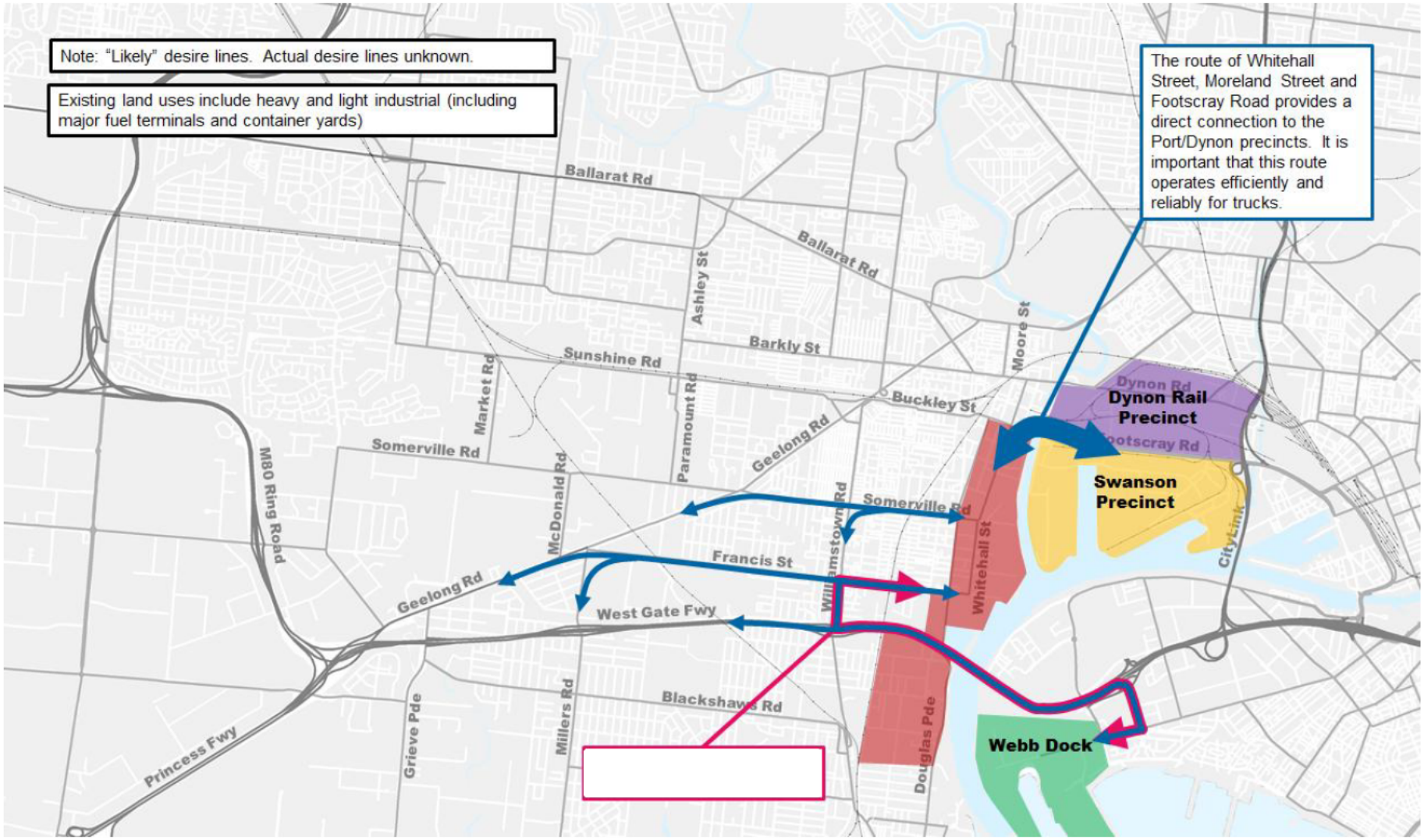
Yarraville Precinct to Swanson Dock and Webb Dock

Existing freight land uses in the Yarraville Precinct are predominantly centred on heavy and light industry, including major fuel terminals and container yards.

From Geelong Road, vehicles entering the Yarraville Precinct can travel along either Francis Street or Somerville Road to connect directly to Whitehall Street (which runs into Moreland Street). This route provides a direct connection to the Port of Melbourne (Swanson Dock) and Dynon precincts. It is important that the Moreland Road and Footscray Road route operates efficiently and reliably for trucks (refer to Figure 80).

With the expansion of Webb Dock as part of the Port Capacity Project, it is expected that a future desire line would be created along Francis Street, Williamstown Road and the West Gate Freeway.

Figure 80 Existing Desire Lines – Yarraville Precinct to Swanson Dock and Webb Dock



Tottenham Precinct to Swanson Dock and Webb Dock

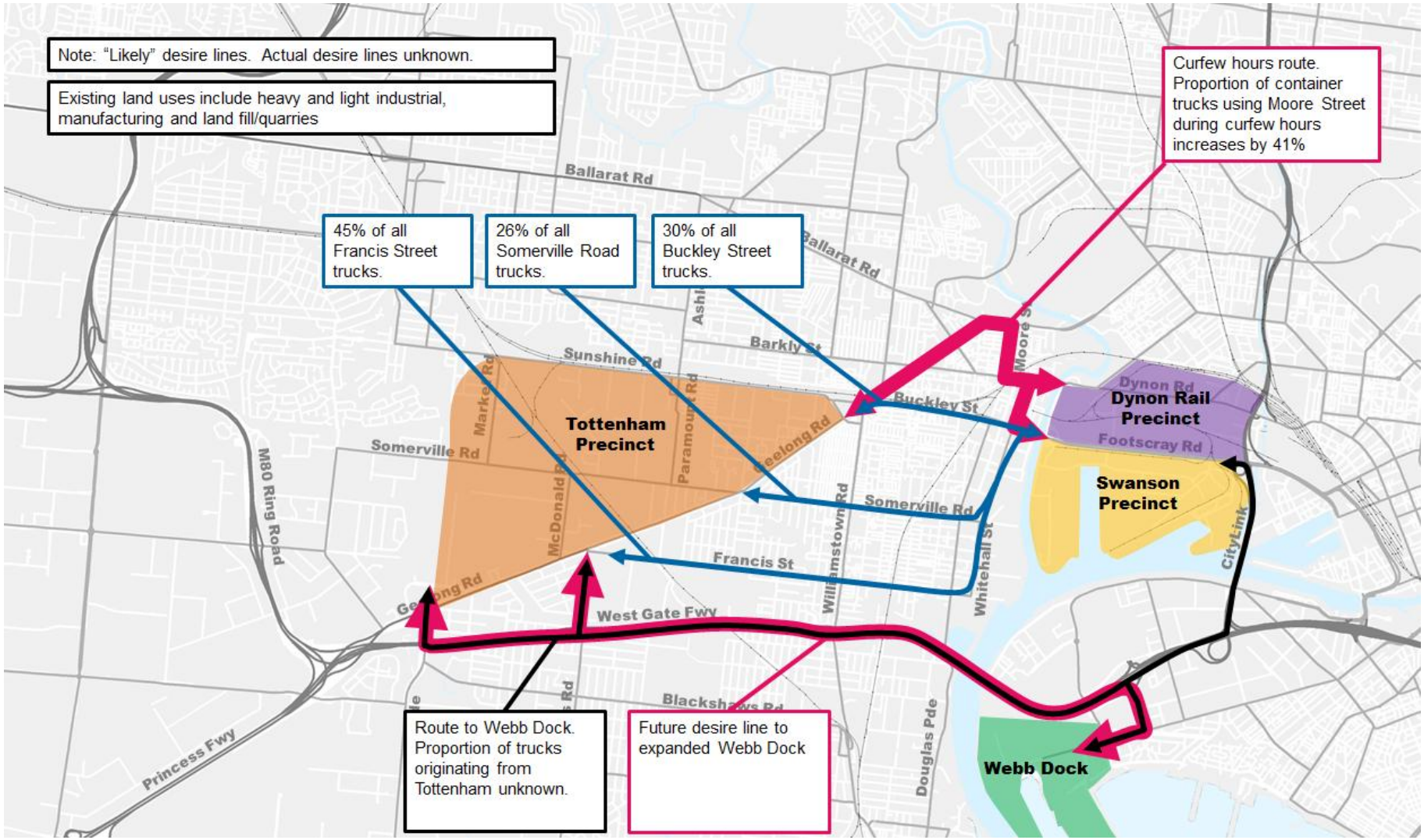
Existing land uses in the Tottenham Precinct include heavy and light industrial units, manufacturing, container yards, landfills and quarries.

Vehicles travelling between the Tottenham Precinct and Swanson Dock mainly use Francis Street and Somerville Road and their connections via Whitehall Street to Footscray Road, as well as the direction connection via Buckley Street/Footscray Road. It is estimated that 45% of all trucks travelling along Francis Street, 26% of all trucks travelling along Somerville Road and 30% of all trucks travelling along Buckley Street are travelling between Swanson Dock and the Tottenham Precinct (refer Figure 81).

During curfew hours, trucks travelling between Tottenham and Swanson Dock use the Moore Street/Whitehall Street route. The proportion of container trucks using Moore Street increases from 34% in non-curfew hours to 75% in curfew hours (41% increase).

The proportion of trucks originating from Tottenham that are travelling to Webb Dock (and onto Swanson Dock) via the Westgate Freeway is unknown. As well as using this route, it is expected that with the expansion of Webb Dock as part of the Port Capacity Project, vehicles would also connect to the West Gate Freeway from Millers Road to travel from Tottenham to Webb Dock.

Figure 81 Existing Desire Lines – Tottenham Precinct to Swanson Dock and Webb Dock



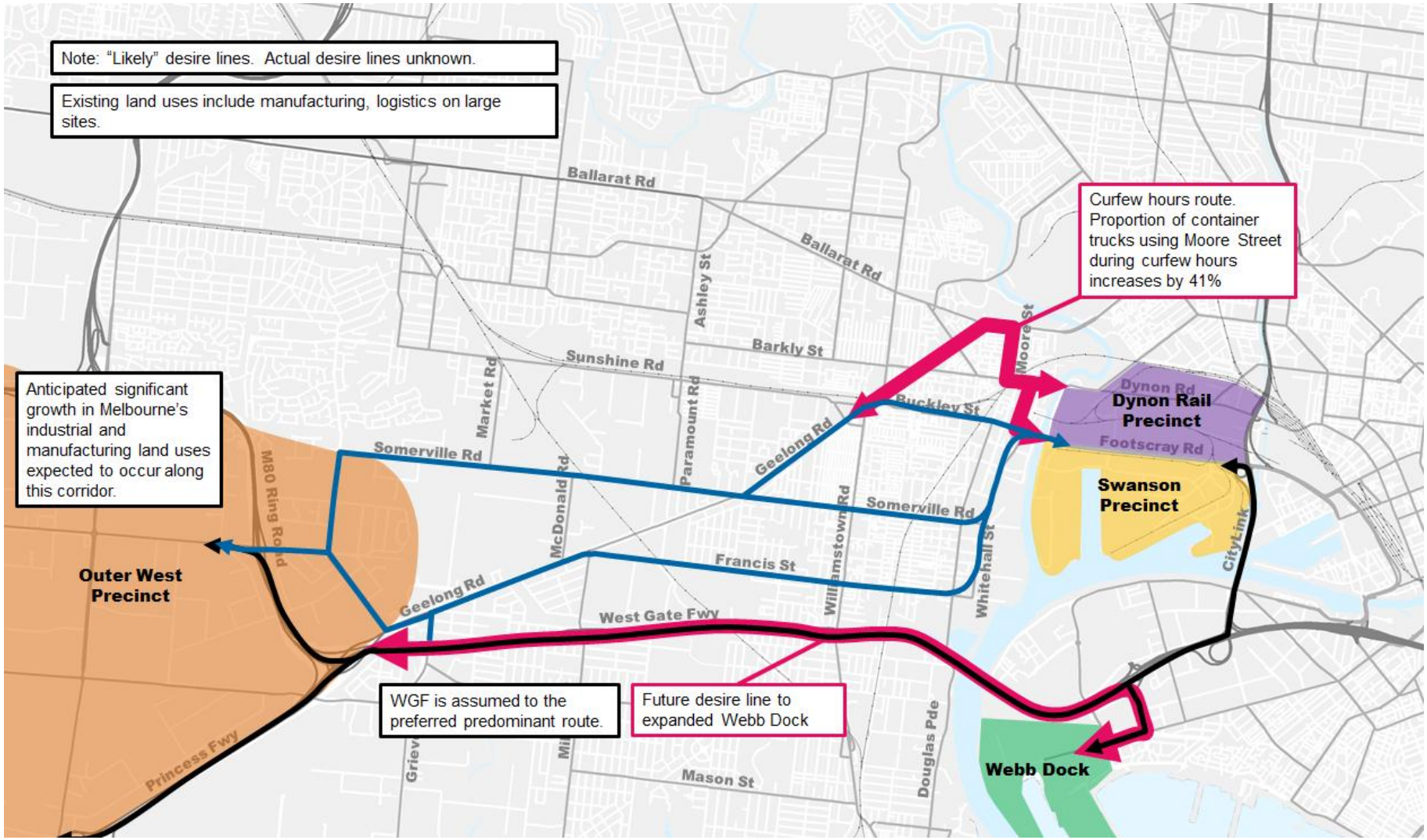
Outer West Precinct to Swanson Dock and Webb Dock

It is anticipated that Melbourne's outer west corridor will experience significant growth in industrial and manufacturing land uses. Current existing land uses in the Outer West Precinct (i.e. west of Tottenham) include manufacturing and logistics businesses on large land holdings.

It is assumed that the West Gate Freeway is the predominant route for vehicles travelling between the Outer West Precinct and Swanson Dock/Webb Dock. Francis Street and Somerville Road and their connections via Whitehall Street to Footscray Road, as well as the direction connection via Buckley Street/Footscray Road, are likely to be used as secondary routes (refer to Figure 82).

As described above in section 0, trucks would travel use the Moore Street/Whitehall Street route to access Swanson Dock during curfew hours.

Figure 82 Existing Desire Lines – Outer West Precinct to Swanson Dock and Webb Dock



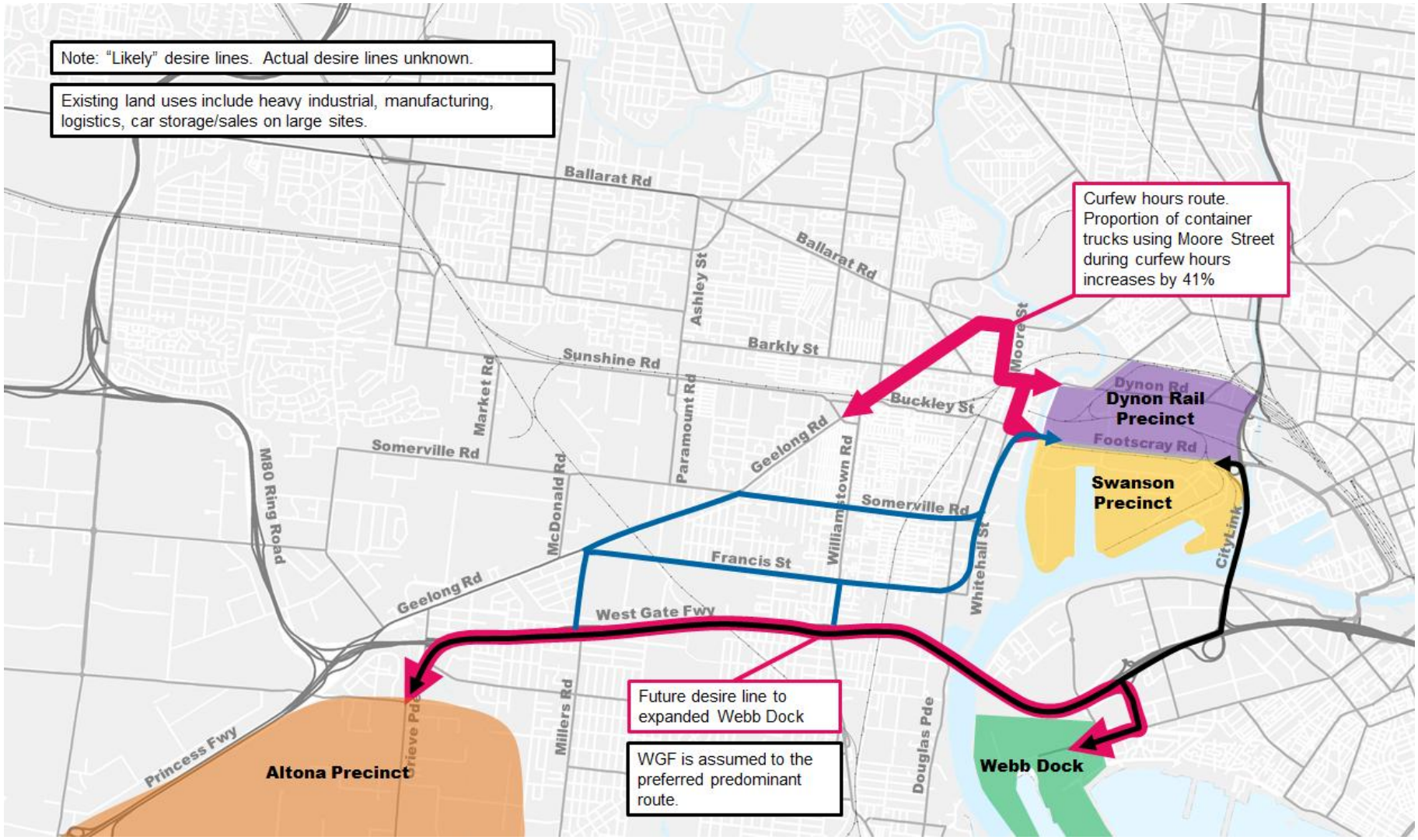
Altona Precinct to Swanson Dock and Webb Dock

The Altona Precinct is located to the south of the West Gate Freeway and east of the Princes Freeway. Current existing land uses in this precinct include heavy industry, manufacturing, logistics and car storage/sales on large land holdings.

It is assumed that the West Gate Freeway is the predominant route for vehicles travelling between the Altona Precinct and Swanson Dock/Webb Dock. Millers Road/Williamstown Road and Francis Street, and Geelong Road/Somerville Road are secondary routes to connect to Whitehall Road/Footscray Road into Swanson Dock (refer to Figure 83).

During curfew hours, trucks would continue along Geelong Road to the north to Moore Street and onto Whitehall Street to reach the Port precinct. The proportion of container trucks using Moore Street during curfew hours increases by 41%.

Figure 83 Existing Desire Lines – Altona Precinct to Swanson Dock and Webb Dock



GHD

180 Lonsdale Street
Melbourne, Victoria 3000
T: (03) 8687 8000 F: (03) 8687 8111 E: melmail@ghd.com.au

[redacted]

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Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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